

**MEMORANDUM**

DATE March 13, 2019

TO Andrea Chow, Sustainability Analyst, City of San Mateo

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SUBJECT Climate Action Plan Update – Summary of updates to GHG Emissions Forecasts and Reduction Targets and Quantification of existing activities

This memo summarizes the results of the updated greenhouse gas emissions reduction targets (Task 2), forecasts (Task 3.1), and assessment of existing GHG reduction activities (Task 3.2).

## Greenhouse Gas Emissions Inventory

As presented to staff and the Sustainability & Infrastructure Commission in January, the PlaceWorks and DNV GL team assessed and updated San Mateo’s existing greenhouse gas (GHG) inventories for the calendar years 2005, 2010, and 2015. The team also prepared a new inventory for the year 2017, showing progress in reducing GHG emissions since the CAP was adopted. **Table 1** shows that emissions have declined 18 percent since 2005, due primarily to cleaner sources of electricity (including from Peninsula Clean Energy) and improvements in vehicle fuel efficiency.

**Table 1: San Mateo Community-Wide Emissions, 2005 and 2017**

SECTOR	2005 MTCO <sub>2</sub> E	2017 MTCO <sub>2</sub> E	PERCENT CHANGE 2005 TO 2017
On-road transportation	282,370	269,110	-4.7%
Commercial and industrial built environment	141,960	85,840	-39.5%
Residential built environment	136,690	97,730	-28.5%
Solid waste generation	29,550	23,680	-19.9%
Off-road equipment	55,780	45,030	-19.3%
Point sources	7,390	14,230	92.6%
Rail	4,350	4,520	3.9%
Water and wastewater	2,520	1,810	-28.2%
<b>Total</b>	<b>660,600</b>	<b>541,960</b>	<b>-18.0%</b>
<i>Due to rounding, totals may not equal the sum of the individual numbers</i>			

## Greenhouse Gas Emissions Forecast

The next stage in the CAP update is to prepare a projection of future GHG emissions, called a forecast, for the calendar years 2020, 2030, and 2050. The forecast shows how San Mateo's GHG emissions are expected to change, given the community's demographic growth, if no action is taken to reduce emissions. The forecast uses San Mateo's 2017 demographics, as well as estimates of future demographics as projected by the Association of Bay Area Governments (ABAG). **Table 2** shows the demographic indicators used in the forecast.

**Table 2: San Mateo Demographic Indicators, 2017 – 2050**

DEMOGRAPHIC INDICATOR	2017	2020	2030	2050	SOURCES
Population	103,470	109,670	123,200	143,600	CA Department of Finance and ABAG
Households	38,950	43,040	48,180	53,630	CA Department of Finance and ABAG
Jobs	63,200	62,570	66,510	69,540	CA Employment Development Department, US Census, and ABAG
Service population *	166,670	172,240	189,710	213,140	

*\* Service population is the number of residents plus the number of jobs.*

San Mateo's GHG emissions are expected to rise by more than 23 percent by 2050, compared to 2017 emissions, if no new action is taken. The forecast assumes that each person in San Mateo will continue to contribute the same amount of GHGs to the community's total, so the amount of GHGs increase as the demographics of the community rise. The one exception is the off-road equipment sector, which is largely driven by the rate of new housing construction. By 2050, San Mateo is expected to be constructing fewer houses annually than it does presently, so emissions in this sector are expected to decrease. **Table 3** shows San Mateo's forecasted community-wide GHG emissions.

**Table 3: San Mateo Community-Wide Forecasted Emissions, 2017 – 2050**

SECTOR	2017 INVENTORY MTCO <sub>2</sub> E	2020 MTCO <sub>2</sub> E	2030 MTCO <sub>2</sub> E	2050 MTCO <sub>2</sub> E	PERCENT CHANGE 2017 TO 2050
On-road transportation	269,110	295,560	329,970	366,190	36.1%
Commercial and industrial built environment	85,840	80,420	85,050	88,610	3.2%
Residential built environment	97,730	101,270	113,360	126,190	29.1%
Solid waste generation	23,680	23,950	24,830	25,880	9.3%
Off-road equipment	45,030	41,650	44,100	38,420	-14.7%
Point sources	14,230	14,230	14,230	14,230	0.0%
Rail	4,520	4,660	5,080	5,650	25.0%
Water and wastewater	1,810	1,860	2,050	2,300	27.1%
<b>Total</b>	<b>541,960</b>	<b>559,420</b>	<b>618,670</b>	<b>667,470</b>	<b>23.2%</b>

*Note: The forecast includes customers who have switched from PG&E to PCE during the 2016 and 2017 enrollment phase. It also assumes PCE's opt-out rate does not change and that PCE's energy sources are consistent. Anticipated changes to PCE's energy sources are included in the Local Reductions analysis.*

*Due to rounding, totals may not equal the sum of the individual numbers.*

## State GHG Emissions Reductions

The State has adopted and continued to implement policies to decrease emission levels from all sectors. Many of these policies are identified in the State’s Scoping Plan, which was originally adopted in 2008 in response to the California Global Warming Solutions Act of 2006. The Scoping Plan outlines several regulatory and market-driven solutions to achieving California’s GHG reduction goals. Successive updates to the Scoping Plan in 2014 and 2017 have revised these state actions as needed and identified additional opportunities for reduction as applicable.

The Scoping Plan and many other documents lay out many statewide programs, policies, and projects to reduce GHG emissions. However, the adopted CAP focuses on those that have the most direct and apparent benefit to the community, and the updated CAP will continue this approach. The PlaceWorks and DNV GL team assessed the local benefits from these actions, allowing San Mateo to receive “credit” for the State’s efforts. These efforts are

1. the Renewables Portfolio Standard (RPS) that requires increases in supplies of renewable electricity;
2. Clean Car Standards that increase the fuel efficiency of vehicles and decreases the carbon intensity of their fuels;
3. improvements to the Title 24 building standards requiring new buildings to be more energy efficient; and
4. the Low Carbon Fuel Standard (LCFS) that reduces the carbon intensity of fuels used in off-road equipment.

**Table 4** shows the reductions from these state actions and how they affect San Mateo’s total GHG emissions.

**Table 4: GHG Reductions from State Actions, 2017 – 2050**

	2017 INVENTORY MTCO <sub>2</sub> E	2020 MTCO <sub>2</sub> E	2030 MTCO <sub>2</sub> E	2050 MTCO <sub>2</sub> E	PERCENT CHANGE 2017 TO 2050
Forecasted emissions without state actions	541,960	559,420	618,670	667,470	23.2%
Reductions from RPS	-	280	5,380	46,300	-
Reductions from clean car standards	-	20,050	91,850	130,530	-
Reductions from Title 24	-	980	7,260	14,670	-
Reductions from LCFS (off-road only)	-	2,770	3,260	2,850	-
<b>Reductions from all state actions</b>	-	<b>24,080</b>	<b>107,750</b>	<b>194,350</b>	-
<b>Emissions with state actions</b>	<b>541,960</b>	<b>535,340</b>	<b>510,920</b>	<b>473,120</b>	<b>-12.7%</b>
<i>Due to rounding, totals may not equal the sum of the individual numbers.</i>					

## Local GHG Emissions Reductions

San Mateo has long been a leader in sustainable practices. The City and its partners implemented several activities to reduce GHG emissions prior to and since the adoption of the CAP in 2015.

One of the most prominent of these activities is Peninsula Clean Energy (PCE), a community choice aggregation program that launched in 2016 and expanded in 2017 as the default electricity provider throughout all of San Mateo County. Establishing a community choice aggregation program was a major GHG reduction strategy in San Mateo’s 2015 CAP, and the City has been a critical participant in establishing the program and ensuring its success. PCE supplies a greater proportion of its electricity from renewable and other carbon-free sources than PG&E, significantly reducing the community’s GHG emissions from electricity use.

There are several other ongoing or planned local activities that are already reducing San Mateo’s GHG emissions or are expected to do so in the future. These include conducting energy efficiency retrofits in private and public buildings, requiring new developments to reduce the number of vehicle trips generated through the City’s Transportation Demand Management (TDM) program, and increases in the amount of organic waste collected in residential and commercial composting bins.

**Table 5** shows the preliminary estimate of GHG reductions from the existing local actions. Actions that have the largest GHG reduction benefit, such as PCE, are identified separately. A full list of existing local actions is included at the end of this memo (**Table 8**).

**Table 5: GHG Reductions from Existing Local Actions, 2020 – 2050**

ACTION	2020 *	2030 *	2050 *
<b>Forecasted emissions with state actions (MTCO<sub>2</sub>e)</b>	<b>535,340</b>	<b>510,920</b>	<b>473,120</b>
Peninsula Clean Energy (MTCO <sub>2</sub> e reduction)	19,630	28,730	0
Caltrain electrification (MTCO <sub>2</sub> e reduction)	0	3,570	3,880
Electric vehicle adoption (MTCO <sub>2</sub> e reduction)	3,370	0	0
Composting (MTCO <sub>2</sub> e reduction)	1,690	1,680	1,680
All other actions (MTCO <sub>2</sub> e reduction)	520	330	260
<b>Total from local actions (MTCO<sub>2</sub>e reduction)</b>	<b>25,210</b>	<b>34,310</b>	<b>5,820</b>
<b>Emissions with existing actions (MTCO<sub>2</sub>e)</b>	<b>510,130</b>	<b>476,610</b>	<b>467,300</b>
<i>* Reductions from action taken after 2017. All actions taken in 2017 or earlier are included in the inventory, and by extension are already built into the forecast.</i>			

## GHG Reduction Targets

The City's current adopted CAP and General Plan establish GHG reduction goals for the community:

- 15 percent below 2005 levels by 2020,
- 35 percent below 2005 levels by 2030, and
- 80 percent below 1990 levels (1990 levels being equal to 15 percent below 2005 levels) by 2050.

Since the CAP was adopted in 2015, the State adopted SB 32, which established a target of 40 percent below 1990 levels by 2030. The State's 2050 goal to reduce to 80 percent below 1990 levels still is the State's vision. Although it has not yet been formally adopted by legislation, the adopted 2020 and 2030 targets align with the 2050 goal. The percent reduction targets consistent with the current state efforts are:

- 15 percent below 2005 levels by 2020,
- 40 percent below 1990 levels by 2030, and
- 80 percent below 1990 levels by 2050.

The California 2017 Climate Change Scoping Plan presents how the state will achieve the 2030 target and recommends that local governments adopt per-capita targets of 6.0 MTCO<sub>2</sub>e per person by 2030 and 2.0 MTCO<sub>2</sub>e per person by 2050. Per capita targets can be in addition to or in lieu of percent reduction targets. **Table 6** shows the percent reduction targets, consistent with current state efforts, compared to San Mateo's forecasted GHG emissions with the benefits of state, regional, and local actions. **Table 7** shows the per-capita targets compared to San Mateo's projected emissions.

**Table 6: GHG Reduction Targets (Percent Reduction), 2020 – 2050**

TARGETS	2020 MTCO <sub>2</sub> E	2030 MTCO <sub>2</sub> E	2050 MTCO <sub>2</sub> E
Forecasted emissions with existing actions	510,130	476,610	467,300
Updated City targets consistent with State targets	561,510	336,910	112,300
Remaining emissions to reduce	-	139,700	355,000

**Table 7: GHG Reduction Targets (Per-Capita), 2020 – 2050**

TARGETS	2020 MTCO <sub>2</sub> E/ PERSON	2030 MTCO <sub>2</sub> E/ PERSON	2050 MTCO <sub>2</sub> E/ PERSON
Forecasted per capita emissions with existing actions	4.7	3.9	3.3
Updated City per-capita targets consistent with State targets	-	6.0	2.0
Remaining per-capita emissions to reduce	-	-	1.3

San Mateo will need to reduce its remaining GHG emissions to meet the reduction targets. The City can revise existing measures in the adopted CAP to increase participation and incorporate new best practices and add new measures to address reductions that were not considered in the adopted CAP. The project team conducted a review of the measures in the adopted CAP, identifying progress made to date in implementing these measures.

## Review of Existing Measures

The adopted CAP has 28 measures in eight categories:

1. Renewable Energy (RE)
2. Energy Efficiency and Conservation (EE)
3. Municipal Energy Efficiency and Conservation (ME)
4. Alternative Fuels (AF)
5. Alternative Transportation (AT)
6. Solid Waste (SW)
7. Water and Wastewater (WW)
8. Off-Road Equipment (OR)

The adopted CAP also includes six existing planned local measures that have contributed to San Mateo's emission reductions since 2005.

The project team assessed the status of the existing CAP measures as “no action”, “ongoing” (for efforts that have been started and are meant to continue in perpetuity), “in progress” (for efforts that have been started and will eventually finish), or “completed”. Based on this assessment and other information about the status of the measures, the project team made recommendations for how these measures should be treated in the updated CAP:

- Update: Continue implementation of the measure which may include making changes or updates to the measure and GHG reduction.
- Remove: Delete the measure in the updated CAP, because the measure is complete, is no longer viable, or will be merged with another measure.

**Table 8** shows the status and recommendations for each measure, as well as the estimated GHG reductions at current participation levels (from post-2017 actions only) and the estimated reductions in the adopted CAP.

We look forward to review and discussion with staff and the Sustainability and Infrastructure Commission on March 13.

Table 8: Assessment of Existing Activities and GHG Reduction Measures

CAP measure number	Measure topic	Sector	Level	Status	Progress to Date and Future Action	Estimated GHG (MTCO <sub>2</sub> e) reductions at current participation levels *	2020 GHG reduction potential in adopted CAP	Update or Remove for CAP
PA 1	Increased housing density	Energy efficiency	Local	Ongoing	New infill development continues, and new policies are being evaluated through the General Plan process.	-	-	Update
PA 2	LED street lights	Energy efficiency	Local	Completed	In 2017, PG&E upgraded 5,629 street lights to LED bulbs.	-	230	Remove
PA 3	Digester gas to biomethane	Solid waste	Local	Completed	The digester was constructed.	-	1,750	Remove
PA 4	County Health Building solar	Renewable energy	Regional	Completed	Solar panels were installed in 2016.	60	200	Remove
PA 5	Parking Management Plan	Alternative transportation	Local	Ongoing	The Parking Management Plan was adopted in 2014 and staff continues to evaluate implementation of the parking policies recommended in the plan.	-	1,570	Update
PA 6	Caltrain electrification	Alternative transportation	Regional	In progress	As of December 2018, infrastructure installation and other activities are proceeding.	- †	-	Update
RE 1	Expanded renewable electricity options	Renewable energy	Local	No action	This measure is an alternative to RE 2. Since PCE was established, it is not necessary.	-	500	Remove
RE 2	Community Choice Aggregation	Renewable energy	Regional	Completed/ Ongoing	PCE was established in 2016 and expanded to serve all of San Mateo in 2017.	19,630	23,720	Remove
RE 3	Renewable energy for new homes	Renewable energy	Local	Ongoing	The City adopted a reach code requiring solar panel installations on all new homes.	40	140	Update

CAP measure number	Measure topic	Sector	Level	Status	Progress to Date and Future Action	Estimated GHG (MTCO <sub>2e</sub> ) reductions at current participation levels *	2020 GHG reduction potential in adopted CAP	Update or Remove for CAP
RE 4	Renewable energy for existing homes	Renewable energy	Local	Ongoing	The City promotes financial incentives and leads educational campaigns to encourage solar installation on existing homes.		3,970	Update
RE 5	Renewable energy for new businesses	Renewable energy	Local	Ongoing	The City adopted a reach code requiring solar panel installations on all new commercial developments.	30	130	Update
RE 6	Renewable energy for existing businesses	Renewable energy	Local	Ongoing	The City promotes financial incentives and leads educational campaigns to encourage solar installation on existing businesses.		560	Update
RE 7	Advanced renewable energy systems	Renewable energy	Local	No action	The City will actively follow emerging technologies, but rapid Building Code cycle changes make this measure difficult to implement.		-	0
EE 1	Residential owner-occupied retrofits	Energy efficiency	Local	Ongoing	BayREN and PACE programs provide financial incentives and educational support for these retrofits.	10	440	Update
EE 2	Residential renter-occupied retrofits	Energy efficiency	Local	Ongoing	BayREN and PACE programs provide financial incentives and educational support for these retrofits.	30	650	Update
EE 3	Nonresidential retrofits	Energy efficiency	Local	Ongoing	Financing and education for nonresidential energy efficiency retrofits is available through the San Mateo Energy Watch and other programs.	10	3,990	Update
EE 4	Healthcare energy efficiency	Energy efficiency	Local	No action	The City does not have access to energy data for health care facilities and therefore consider merging with EE 3.	-	1,710	Remove



CAP measure number	Measure topic	Sector	Level	Status	Progress to Date and Future Action	Estimated GHG (MTCO <sub>2e</sub> ) reductions at current participation levels *	2020 GHG reduction potential in adopted CAP	Update or Remove for CAP
EE 5	Residential low-cost retrofits	Energy efficiency	Local	Ongoing	The City has provided funding to support energy efficiency education and low-cost retrofits to low-income households. Consider merging with EE 1 and EE 2.	-	230	Remove
EE 6	Nonresidential low-cost retrofits	Energy efficiency	Local	Ongoing	The county-wide Green Business Certification project helps encourage energy efficiency and other sustainable actions in local businesses. Consider merging with EE 3.	-	70	Remove
ME 1	Energy efficiency at new City buildings	Energy efficiency	Local	Ongoing	The City is considering renewable energy installations and energy efficiency actions at the new Wastewater Treatment Plant.	-	0	Update
ME 2	Energy efficiency at existing City buildings	Energy efficiency	Local	In Progress	In 2018, with funding from C/CAG the City worked with the San Mateo County Energy Watch program to upgrade lighting at 15 City facilities. Currently, the City is participating in PG&E's Sustainable Solutions Turnkey program to upgrade lighting and HVAC at the larger City facilities.	-	0	Update
AF 1	Public EV chargers	Alternative fuels	Local	Ongoing	There are 14 chargers at City-owned parking garages and lots, used an average of 700 times monthly. Two DC Fast Chargers have been installed at the Transit Center Garage and are used an average of 720 times monthly, along with another two Level 2 chargers at this facility.	10	40	Update
AF 2	EV adoption	Alternative fuels	Local	Ongoing	The City has hosted several events to raise awareness about EVs and has adopted a reach code requiring more EV-ready parking spaces at new multifamily and commercial projects than what the State mandates.	3,370	6,110	Update

CAP measure number	Measure topic	Sector	Level	Status	Progress to Date and Future Action	Estimated GHG (MTCO <sub>2e</sub> ) reductions at current participation levels *	2020 GHG reduction potential in adopted CAP	Update or Remove for CAP
AT 1	Public shuttles	Alternative transportation	Local	Ongoing	The City contributes to Commute.org to support shuttles in San Mateo. Caltrain shuttle service continues in San Mateo.	20	50	Update
AT 2	Transportation Demand Management	Alternative transportation	Local	Ongoing	The City continues to require new development projects to adopt TDM plans to reduce the number of vehicle trips they generate.	270	3,090	Update
AT 3	Car sharing	Alternative transportation	Local	Ongoing	The City offers carshare in public parking lots through a partnership with Zip Car. Recommend merging with AT2.	Unknown	2,120	Remove
AT 4	Increased bike mode share	Alternative transportation	Local	Ongoing	The City has been installing new bike lanes and other bike infrastructure. The City is updating the Bicycle Master Plan. The City has supported bike share pilot programs since 2016 and is currently in the process of developing a shared mobility permit program to formalize regulations.	40	660	Update
AT 5	Increased pedestrian mode share	Alternative transportation	Local	Ongoing	The City has made numerous improvements to the pedestrian infrastructure in the community. The City has an adopted Pedestrian Master Plan.	-	0	Update
SW 1	Increased composting	Solid waste	Local	Ongoing	The composting program has increased the number of businesses and multifamily households participating, and there are ongoing efforts to expand commercial participation.	1,690	8,940	Update

CAP measure number	Measure topic	Sector	Level	Status	Progress to Date and Future Action	Estimated GHG (MTCO <sub>2e</sub> ) reductions at current participation levels *	2020 GHG reduction potential in adopted CAP	Update or Remove for CAP
WW 1	Water efficiency retrofits	Water and wastewater	Local	Ongoing	The City libraries distribute kits that help residents conduct low-cost energy and water efficiency retrofits. Rebates are available for various energy efficiency retrofits.	-	20	Update
WW 2	Water-efficient landscaping	Water and wastewater	Local	Ongoing	The City is conducting education efforts on water-efficient landscaping, has reduced water use for landscapes at City properties, and offers rebates for community members who install rain barrels. This is not a GHG reduction strategy and therefore does not need to be tracked through the CAP.	-	0	Remove
WW 3	New non-potable water sources	Water and wastewater	Local	In Progress	The Clean Water Program is evaluating the possibility of providing recycled water to the community. This is not a GHG reduction strategy and therefore does not need to be tracked through the CAP.	-	0	Remove
OR 1	Alternative fuel lawn and garden equipment	Off-road equipment	Local	Ongoing	City maintenance staff are looking at the feasibility of alternative-fuel landscaping equipment in an ongoing pilot program.	-	40	Update
OR 2	Alternative fuel construction equipment	Off-road equipment	Local	No action	Implementation has not proven feasible.	-	30	Remove

\* Reductions from action taken after 2017. All actions taken in 2017 or earlier are included in the inventory, and by extension are already built into the forecast.