4.5 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

INTRODUCTION

This section evaluates the proposed Community Plan's greenhouse gas (GHG) emissions and impacts on global climate change. The environmental setting presents background and terminology with respect to climate change and provides a description of the existing environment within the vicinity of the Plan Area. The regulatory setting provides a description of applicable federal, State, and local regulatory policies related to climate change and GHGs. The impact assessment section evaluates the potential for the proposed Community Plan at buildout to result in impacts associated with the generation of GHG emissions that directly or indirectly impact the environment or the potential to conflict with applicable plans, policies or regulations adopted for the purpose of reducing GHGs. Finally, feasible mitigation measures intended to reduce impacts to climate change are prescribed, where appropriate, to avoid or lessen the significant impacts of the proposed Community Plan.

ENVIRONMENTAL SETTING

Greenhouse Gases

Gases that trap heat in the atmosphere are called Greenhouse Gases (GHGs). Scientist believe increases in GHG concentrations in the earth's atmosphere play a critical role in determining temperature near the earth's surface (i.e., global climate change). Global climate change is the change in the average weather on Earth that can be measured by wind patterns, the frequency and intensity of storms, precipitation, and temperature. The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). These gases allow high-frequency shortwave solar radiation to enter the earth's atmosphere, and help retain some of the low frequency infrared energy, which is radiated back from the earth towards space, resulting in a warming of the atmosphere. However, not all GHGs possess the same ability to induce climate change; as a result, GHG contributions (or emissions) are commonly quantified and reported in the units of carbon dioxide equivalents (CO_2e). Mass emissions are calculated by converting pollutant specific emissions to carbon dioxide equivalent (CO_2e) emissions by applying the proper global warming potential (GWP) value. Each greenhouse gas (GHG) has a global warming potential value, which reflects the climate forcing of a kilogram of emissions relative to the same mass of carbon dioxide (CO_2).[1] These GWP ratios are available from the Intergovernmental Panel on Climate Change (IPCC). The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. By applying the GWP ratios, CO_2e emissions can be tabulated for the project in metric tons per year. Typically, the GWP ratio corresponding to the warming potential of carbon dioxide (CO_2) over a 100-year period is used as a baseline. Currently, the State of California uses the GWPs from the IPCC Fourth Assessment Report (AR4) in the official State GHG emissions inventory.[2] Prior to the 2014 reporting year, the State utilized GWPs from the IPCC Second Assessment Report (SAR).

Compounds that are regulated as GHGs are discussed below.

1 California Air Resources Board. Global Warming Potentials. https://ww2.arb.ca.gov/ghg-gwps. Accessed May 26, 2020

2 Intergovernmental Panel on Climate Change (IPCC), 2014. Fifth Assessment Report Synthesis Report.

- Carbon Dioxide (CO_2). CO_2 is the most abundant GHG in the atmosphere and is primarily generated from fossil fuel combustion from stationary and mobile sources. CO_2 is the reference gas (GWP of 1) used for determining the GWPs of other GHGs.
- Methane (CH_4). CH_4 is emitted from biogenic sources (i.e., resulting from the activity of living organisms), incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. The GWP of CH_4 is 21 in the IPCC SAR and 25 in the IPCC AR4.
- Nitrous Oxide (N_2O). N_2O produced by human-related sources including agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. The GWP of N_2O is 310 in the IPCC SAR and 298 in the IPCC AR4.
- Hydrofluorocarbons (HFCs). HFCs are fluorinated compounds consisting of hydrogen, carbon, and fluorine. They are typically used as refrigerants in both stationary refrigeration and mobile air conditioning systems. The GWPs of HFCs ranges from 140 for HFC-152a to 11,700 for HFC-23 in the IPCC SAR and 124 for HFC-152a to 14,800 for HFC-23 in the IPCC AR4.
- Perfluorocarbons (PFCs). PFCs are fluorinated compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semiconductor manufacturing. The GWPs of PFCs range from 6,500 to 9,200 in the IPCC SAR and 7,390 to 17,700 in the IPCC AR4.
- Sulfur Hexafluoride (SF_6). SF_6 is a fluorinated compound consisting of sulfur and fluoride. It is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. SF_6 has a GWP of 23,900 in the IPCC SAR and 22,800 in the IPCC AR4.

Effects of Climate Change

The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model all climate parameters, the uncertainty surrounding climate change may never be completely eliminated. Nonetheless, the IPCC, in its Fifth Assessment Report, Summary for Policy Makers, stated that, "it is extremely likely [95–100 percent] that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic forcings together."[3] A report from the National Academy of Sciences concluded that 97 to 98 percent of the climate researchers most actively publishing in the field support the tenets of the IPCC determination that climate change is very likely caused by human (i.e., anthropogenic) activity.[4]

According to the California Air Resources Board (CARB), the potential impacts in California due to global climate change can include: loss in snow pack; sea level rise; more extreme heat days

3 Intergovernmental Panel on Climate Change, 2013. Fifth Assessment Report, Summary for Policy Makers.

4 Anderegg, William R. L., J.W. Prall, J. Harold, S.H., Schneider, 2010. Expert Credibility in Climate Change, Proceed-ings of the National Academy of Sciences of the United States of America. 2010;107:12107-12109.

per year; more high ozone days; more, larger forest fires; more drought years; increased erosion of California's coast-lines and sea water intrusion into the Sacramento and San Joaquin Deltas and associated levee systems; and increased pest infestation.[5] Below is a summary of some of the potential effects that could be experienced in California as a result of global warming and climate change.

Temperature Increase

The primary effect of adding GHGs to the atmosphere has been a rise in the average global temperature. The impact of human activities on global temperature is readily apparent in the observational record. Since 1895, the contiguous U.S. has observed an average temperature increase of 1.5°F per century. The last five-year period (2014–2019) is the warmest on record for the contiguous U.S., while the 20 warmest years have occurred over the past 22-year period.[6,7]

The Fourth Assessment indicates that average temperatures in California could rise 5.6°F to 8.8°F by the end of the century, depending on the global trajectory of GHG emissions.[8] According to the Cal-Adapt website, the portion of the state in which the County is located could experience an average increase in temperature of approximately 4.2° to 6.9°F by 2070-2090, compared to the baseline period of 1961-1990.

With climate change, extreme heat conditions and heat waves are predicted to impact larger areas, last longer, and have higher temperatures. Heat waves, defined as three or more days with temperatures above 90°F, are projected to occur more frequently by the end of the century. Extreme heat days and heat waves can negatively impact human health. Heat-related illness includes a spectrum of illnesses ranging from heat cramps to severe heat exhaustion and life-threatening heat stroke.[9]

Air Quality

Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California as a result of climate change and make it more difficult for the State to achieve air quality standards. Climate change could increase the concentration of ground-level ozone in particular, which can cause breathing problems, aggravate lung diseases such as asthma, emphysema, chronic bronchitis, and cause chronic obstructive pulmonary disease (COPD). However, the magnitude of the effect, and therefore, its indirect effects, are uncertain. Emissions from wildfires can lead to excessive levels of particulate matter, ozone, and volatile organic compounds.[10] Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state.[11]

5 California Environmental Protection Agency (CalEPA), 2006. Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature.

6 National Oceanic and Atmospheric Association (NOAA), 2019. Assessing the U.S. Climate in 2018. https://www.ncei.noaa.gov/news/national-climate-201812. Published February 6.

7 Climate Central, 2019. Available: https://www.climatecentral.org/gallery/maps/2018-global-temp-review-land-ocean. Published February 6, 2019.

8 OPR 2018. California's Fourth Climate Change Assessment: Statewide Summary Report. August 2018.

9 CalEPA, 2013. Preparing California for Extreme Heat: Guidance and Recommendations. Available: https://toolkit.climate.gov/reports/preparing-california-extreme-heat-guidance-and-recommendations. October 2013.

10 Kenward, A, et al., 2013. Wildfires and Air Pollution: The Hidden Health Hazards of Climate Change. Climate Central. Available: http://assets.climatecentral.org/pdfs/WildfiresAndAirPollution.pdf.

11 CalEPA, 2013. Preparing California for Extreme Heat: Guidance and Recommendations. Available: https://toolkit.climate.gov/reports/preparing-california-extreme-heat-guidance-and-recommendations. October 2013.

Water Supply

There is a high degree of uncertainty with respect to the overall impact of global climate change on future water supplies in California. Studies indicate considerable variability in predicting precise impacts of climate change on California hydrology and water resources. Increasing uncertainty in the timing and intensity of precipitation will challenge the operational flexibility of California's water management systems. Warmer, wetter winters would increase the amount of runoff available for groundwater recharge; however, this additional runoff would occur at a time when some basins are either being recharged at their maximum capacity or are already full. Conversely, reductions in spring runoff and higher evapotranspiration because of higher temperatures could reduce the amount of water available for recharge.[12] In addition, droughts in California are a recurring feature of California's climate. The most recent drought from 2012-2016 was one of extreme proportions, with record-high temperatures and record-low levels of snowpack and precipitation. Drought negatively affects both the quantity and quality of water supplies. Drought can also compromise water quality, such as by concentrating salts and other contaminants, reducing dissolved oxygen levels, and increasing water temperatures.

Hydrology and Sea Level Rise

Climate changes could potentially affect the amount of snowfall, rainfall and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise can be a product of global warming through two main processes: expansion of seawater as the oceans warm, and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply. Sea level could potentially rise as much as two feet along most of the U.S. coastline. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.[13]

Agriculture

California has a massive agricultural industry that represents 11.3 percent of total U.S. agricultural revenue. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, a changing climate presents significant risks to agriculture due to "potential changes to water quality and availability; changing precipitation patterns; extreme weather events including drought, severe storms, and floods; heat stress; decreased chill hours; shifts in pollinator lifecycles; increased risks from weeds, pest and disease; and disruptions to the transportation and energy infrastructure supporting agricultural production".[14]

Ecosystem and Wildlife

Increases in global temperatures and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Scientists expect that the average global surface temperature could rise by 2-11.5°F (1.1-6.4°C) by 2100, with significant regional variation.[15] Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. With climate change, ecosystems and wildlife will be challenged by the spread of invasive species, barriers to species migration or movement in response to changing

12 California Natural Resources Agency (CNR), 2014. Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy. Available: http://resources.ca.gov/climate/safeguarding/. July 2014.

13 California Natural Resources Agency (CNR), 2014. Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy. Available: http://resources.ca.gov/climate/safeguarding/. July 2014.

14 California Natural Resources Agency (CNR), 2014. Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy. Available: http://resources.ca.gov/climate/safeguarding/. July 2014.

15 National Research Council (NRC), 2010. Advancing the Science of Climate Change.

climatic conditions, direct impacts to species health, and mismatches in timing between seasonal life-cycle events such as species migration and food availability.[16]

Wildfires

The hotter and dryer conditions expected with climate change will make forests more susceptible to extreme wildfires. One study found that if GHG emissions continue to rise, the frequency of extreme wildfires burning over approximately 25,000 acres would increase by nearly 50 percent, and the average area burned statewide each year would increase by 77 percent, by the year 2100. In the areas that have the highest fire risk, wildfire insurance is estimated to see costs rise by 18 percent by 2055 and the fraction of property insured would decrease.[17]

Emissions Inventories

Global Emissions

Worldwide human-made emissions of GHGs were approximately 49,000 million metric tons (MMT) of CO_2e annually including ongoing emissions from industrial and agricultural sources and emissions from land use changes (e.g., deforestation).[18] Emissions of CO_2 from fossil fuel use and industrial processes account for 65 percent of the total while CO_2 emissions from all sources accounts for 76 percent of the total. Methane emissions account for 16 percent and N_2O emissions for 6.2 percent. In 2013, the United States was the world's second largest emitter of carbon dioxide at 5,300 $MMTCO_2e$ (China was the largest emitter of carbon dioxide at 10,300 $MMTCO_2e$).[19]

U.S. Emissions

In 2017, the United States emitted about 6,457 MMT of CO_2e, 76.1 percent of which came from fossil fuel combustion. Of the major sectors nationwide, transportation accounts for the highest amount of GHG emissions (approximately 29 percent), followed by electricity (28 percent), industry (22 percent), agriculture (9 percent), commercial buildings (6 percent), and residential buildings (5 percent). Between 1990 and 2017, total U.S. GHG emissions rose by 1.3 percent, but emissions have generally decreased since peaking in 2005. Since 1990, U.S. emissions have increased at an average annual rate of 0.4 percent.[20]

California Greenhouse Gas Emissions Inventory

CARB compiles GHG inventories for the State. Based on the 2016 GHG inventory data (i.e., the latest year for which data are available from CARB) prepared by CARB in 2018, California emitted 429.4 million metric tons of CO_2e ($MMTCO_2e$) including emissions resulting from imported electrical power.[21] Between 1990 and 2016, the population of California grew by approximately 9.4 million (from 29.8 to 39.2 million) (DOF, 2019). This represents an increase of

16 California Natural Resources Agency (CNR), 2014. Safeguarding California: Reducing Climate Risk, an Update to the 2009 California Climate Adaptation Strategy. Available: http://resources.ca.gov/climate/safeguarding/. July 2014.

17 Westerling, Anthony LeRoy. (2018). Wildfire Simulations for the Fourth California Climate Assessment: Projecting Changes in Extreme Wildfire Events with a Warming Climate. California's Fourth Climate Change Assessment, California Energy Commission. Publication number: CCCA4-CEC-2018-014

18 Intergovernmental Panel on Climate Change (IPCC), 2014. Fifth Assessment Report Synthesis Report.

19 PBL Netherlands Environmental Assessment Agency and the European Commission Joint Research Center (2014). Trends in Global CO_2 Emissions 2014 Report.

20 United States Environmental Protection Agency (USEPA), 2019. Inventory of U.S. Greenhouse Gas Emissions and Sinks Fast Facts. Available: https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks-fast-facts.

21 California Air Resources Board, 2018a. "Gas California Greenhouse Gas 2000-2016 Inventory by Scoping Plan Category – Summary. Available: https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-16.pdf. June 22, 2018.

approximately 31 percent from 1990 population levels. In addition, the California economy, measured as gross state product, grew from $773 billion in 1990 to $2.26 trillion in 2016 representing an increase of approximately 292 percent (almost three times the 1990 gross state product) in today's dollars.[22] Despite the population and economic growth, CARB's 2016 statewide inventory indicated that California's net GHG emissions in 2016 were just below 1990 levels, which is the 2020 GHG reduction target codified in California Health and Safety Code (HSC), Division 25.5, also known as The Global Warming Solutions Act of 2006 (AB 32). Table 4.5-1, State of California Greenhouse Gas Emissions, identifies and quantifies statewide anthropogenic GHG emissions and sinks (e.g., carbon sequestration due to forest growth) in 1990 and 2016. As shown in Table 4.5-1, the transportation sector is the largest contributor to statewide GHG emissions at approximately 39 percent in 2016.

Local

Winton is a small, agriculturally-based community surrounded by rural agricultural operations typical of Merced County, including orchards, row crops and grazing land. The present Winton Community Plan area is approximately 750 acres and includes 4,627 residential units and approximately 1,818,031 square feet of commercial, industrial, mixed use, and recreational buildings. The proposed Community Plan would remove or replace some of these existing land uses, as well as providing additional land for new development (see Chapter 3, Project Description for more details). For the most part, the existing land uses are not anticipated to change appreciably. To be conservative, this section assumes that all land use development discussed in the Winton Community Plan is new development. Therefore, baseline emissions were not quantified as part of the analysis. According to the Merced County General Plan, GHG emissions within the unincorporated County for 2020 are anticipated to be 5,105,750 $MTCO_2e$/year and 5,623,364 $MTCO_2e$ annually for 2030. 2035 emissions have not been estimated.[23]

REGULATORY SETTING

Federal

Clean Air Act

The principal air quality regulatory mechanism at the federal level is the Clean Air Act (CAA) and in particular, the 1990 amendments to the CAA which established the National Ambient Air Quality Standards (NAAQS). The federal CAA does not specifically regulate GHG emissions; however, the U.S. Supreme Court has determined that GHGs are pollutants that can be regulated under the federal CAA. There are currently no federal regulations that set ambient air quality standards for GHGs.

Corporate Average Fuel Economy (CAFE) Standards

Established by the U.S. Congress in 1975, the CAFE standards reduce energy consumption by increasing the fuel economy of cars and light trucks. The National Highway Traffic Safety Administration (NHTSA) and US EPA jointly administer the CAFE standards. The U.S. Congress has specified that CAFE standards must be set at the "maximum feasible level" with consideration given to: (1) technological feasibility; (2) economic practicality; (3) effect of other

22 California Department of Finance, 2018. Gross State Product. Available: http://www.dof.ca.gov/Forecasting/Economics/Indicators/Gross_State_Product/. Amounts are based on current dollars as of the date of the report (May 2018).

23 Merced County 2012. Merced County General Plan Revised Draft Background Report. November 30. Chapter 12 Climate Change.

TABLE 4.5-1
State of California Greenhouse Gas Emissions

	Total 1990 Emissions Using IPCC SAR ($MMTCO_2e$)	Percent of Total 1990 Emissions	Total 2016 Emissions using IPCC AR4 ($MMTCO_2e$)	Percent of Total 2016 Emissions
Transportation	150.7	35%	169.4	39%
Electric Power	110.6	26%	68.6	16%
Commercial[a]	14.4	3%	15.2	4%
Residential[a]	29.7	7%	24.2	6%
Industrial[a]	103.0	24%	89.6	21%
Recycling and Waste[b]	-	-	8.8	2%
High GWP/Non-Specified[c]	1.3	<1%	19.8	5%
Agriculture/Forestry	23.6	6%	33.8	8%
Forestry Sinks	-6.7		—[d]	—[d]
Net Total (IPCC SAR)	**426.6**	**100%[f]**	—	—
Net Total (IPCC AR4)[e]	**431**	**100%[f]**	**429.4**	**100%**

a Sources of emissions include solid waste generation, area source emissions (such as landscaping), natural gas consumption, and stationary sources.
b Included in other categories for the 1990 emissions inventory.
c High GWP gases are not specifically called out in the 1990 emissions inventory.
d Revised methodology under development (not reported for 2012).
e CARB revised the state's 1990 level GHG emissions using GWPs from the IPCC Fourth Assessment Report (IPCC AR4).
e Total of individual percentages may not add up to 100% due to rounding. Revised methodology under development (not reported for 2016).
Sources:
California Air Resources Board, 2018. "Gas California Greenhouse Gas 2000-2016 Inventory by Scoping Plan Category – Summary. Available: https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-16.pdf. June 22, 2018.
California Air Resources Board, 2007. Staff Report – California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit.

standards on fuel economy; and (4) the need for the nation to conserve energy.

Fuel efficiency standards for medium- and heavy-duty trucks have been jointly developed by US EPA and NHTSA. The Phase 1 heavy-duty truck standards apply to combination tractors, heavy-duty pickup trucks and vans, and vocational vehicles for model years 2014 through 2018, and result in a reduction in fuel consumption from 6 to 23 percent over the 2010 baseline,

depending on the vehicle type.[24] US EPA and NHTSA have also adopted the Phase 2 heavy-duty truck standards, which cover model years 2021 through 2027 and require the phase-in of a 5 to 25 percent reduction in fuel consumption over the 2017 baseline depending on the compliance year and vehicle type.[25]

U.S. Department of Transportation, U.S. Department of Energy, and U.S. Environmental Protection Agency on Transportation Energy

On the federal level, the U.S. Department of Transportation, U.S. Department of Energy, and US EPA are three agencies with substantial influence over energy policies related to transportation fuels consumption. Generally, federal agencies influence transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy-related research and development projects, and through funding for transportation infrastructure projects.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, US EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule was a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required US EPA to develop "…mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy…." The Reporting Rule applied to most entities that emit 25,000 metric tons of CO_2e or more per year at their facility from stationary sources. Starting in 2010, facility owners were required to submit an annual GHG emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandated recordkeeping and administrative requirements in order for US EPA to verify annual GHG emissions reports.

Vehicle Emissions Standards

In 1975, Congress enacted the Energy Policy and Conservation Act, which established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the act, US EPA and National Highway Traffic Safety Administration (NHTSA) are responsible for establishing additional vehicle standards. In 2012, standards were adopted for model year 2017 through 2025 for passenger cars and light-duty trucks. Under the standards, by 2025 vehicles are required to achieve 54.5 mpg (if GHG reductions are achieved exclusively through fuel economy improvements) and a reduction of 163 grams of CO_2 per mile. According to US EPA, a model year 2025 vehicle would emit one-half of the GHG emissions as compared to emissions from a model year 2010 vehicle.[26] California harmonized its vehicle efficiency standards through 2025 with the federal standards (see Advanced Clean Cars Program below).

In 2017, US EPA issued its Mid-Term Evaluation of the GHG emissions standards, finding that it would be practical and feasible for automakers to meet the model year 2022-2025 standards through a number of existing technologies. In 2018, US EPA revised its 2017 determination, and issued a proposed rule that maintains the 2020 Corporate Average Fuel Economy (CAFE) and

24 United States Environmental Protection Agency (US EPA), 2011. Fact Sheet: EPA and NHTSA Adopt First-Ever Program to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium- and Heavy-Duty Vehicles, August, https://nepis.epa.gov/Exe/ZyPDF.cgi/P100BOT1.PDF?Dockey=P100BOT1.PDF.

25 United States Environmental Protection Agency (USEPA), 2016. Federal Register/Vol. 81, No. 206/Tuesday, Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2, October 25, https://www.gpo.gov/fdsys/pkg/FR-2016-10-25/pdf/2016-21203.pdf.

26 United States Environmental Protection Agency (USEPA), 2012. 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards. Available: (August 2012). Available: https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-model-year-2017-and-later-light-duty-vehicle.

CO_2 standards for model years 2021 through 2026.[27] The estimated CAFE and CO_2 standards for model year 2020 are 43.7 mpg and 204 grams of CO_2 per mile for passenger cars and 31.3 mpg and 284 grams of CO_2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. In 2019, the State of California, joined by 16 other states and the District of Columbia, filed a petition challenging the US EPA's proposed rule to revise the vehicle emissions standards, arguing that US EPA had reached erroneous conclusions about the feasibility of meeting the existing standards.[28] As of April, 9, 2019, the case was pending and oral arguments had not been scheduled. Accordingly, due to the uncertainty of future federal regulations, this analysis assumes that the existing CAFE standards will remain unchanged.

State

California Energy Commission

The California Energy Commission (CEC) is California's primary energy policy and planning agency. The CEC has five major responsibilities: (1) forecasting future energy needs and keeping historical energy data; (2) licensing thermal power plants 50 MW or larger; (3) promoting energy efficiency through appliance and building standards; (4) developing energy technologies and supporting renewable energy; and (5) planning for and directing State response to energy emergencies.

California Health and Safety Code, Division 25.5 – California Global Warming Solutions Act of 2006 (AB 32)

In 2006, following the issuance of Executive Order S-3-05, the California Global Warming Solutions Act of 2006 (passed as Assembly Bill (AB) 32 and codified in the California Health and Safety Code [HSC], Division 25.5) focuses on reducing GHG emissions in California to 1990 levels by 2020. HSC Division 25.5 defines GHGs as CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6 and represents the first enforceable statewide program to limit emissions of these GHGs from all major industries with penalties for noncompliance. The law further requires that reduction measures be technologically feasible and cost effective. AB 32 also tasked the CEC and CPUC with providing information, analysis, and recommendations to CARB regarding strategies to reduce GHG emissions in the energy sector.

Under HSC Division 25.5, CARB has the primary responsibility for reducing GHG emissions. In 2016, SB 32 and its companion bill AB 197 amended HSC Division 25.5 and established a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and include provisions to ensure that the benefits of State climate policies reach into disadvantaged communities.

California Building Standards Code (Title 24, Parts 6 and 11)

In 1978, the California Energy Commission (CEC) first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR, Title 24, Part 6) in response to a legislative mandate to reduce energy consumption in the state. Although not originally intended to reduce GHG emissions, the increased energy efficiency and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the CEC standards. The standards are updated periodically (typically every three years) to allow for the consideration and inclusion of new energy efficiency technologies and methods. The Energy Efficiency Standards for Residential and Nonresidential Buildings

27 Federal Register, 2018. Vol. 83, No. 165. August 24. Proposed Rules.

28 Amicus brief, 2019. USCA Case #18-1114, Doc#1772455_filed February 14, 2019. Available: http://climatecasechart.com/case/california-v-epa-4/.

focuses on several key areas to improve the energy efficiency of renovations and addition to existing buildings as well as newly constructed buildings and renovations and additions to existing buildings. The major efficiency improvements to the residential standards involve improvements for attics, walls, water heating, and lighting, whereas the major efficiency improvements to the nonresidential standards include alignment with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) national standards. Furthermore, the standards require that enforcement agencies determine compliance with CCR, Title 24, Part 6 before issuing building permits for any construction.

Part 11 of the Title 24 Building Energy Efficiency Standards is referred to as the California Green Building Standards (CALGreen) Code. The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories: planning and design; energy efficiency; water efficiency and conservation; material conservation and resource efficiency; and environmental air quality." The CALGreen Code is not intended to substitute for or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission. The CALGreen Code establishes mandatory measures for new residential and non-residential buildings. Such mandatory measures include energy efficiency, water conservation, material conservation, planning and design and overall environmental quality.

California Assembly Bill (AB) 341

In 2011, Assembly Bill 341 requires that integrated waste management plans set a policy goal of reducing not less than 75% of solid waste to be diverted from landfill disposal by 2020. AB 341 also requires that any business that generates more than 4 cubic yards of commercial solid waste per week to arrange for recycling services.

Low Carbon Fuel Standard

In 2007, Executive Order S-01-07 mandates that the State: (1) establish a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020; and (2) adopt a Low Carbon Fuel Standard (LCFS) for transportation fuels in California. The overall goal of the LCFS is to lower the carbon intensity of California transportation fuel. The 2017 Scoping Plan Update calls for the LCFS to reduce fuel carbon intensity by at least 18 percent by 2030. In 2018, CARB extended the LCFS program to 2030, making significant changes to the design and implementation of the Program including a doubling of the carbon intensity reduction to 20 percent by 2030.

CARB's Advanced Clean Car Program

The Advanced Clean Cars Emissions-Control Program was approved by CARB in 2012 and is closely associated with the Pavley regulations.[29] The program requires a greater number of zero-emission vehicle models for years 2015 through 2025 to control smog, soot, and GHG emissions. This program includes the Low-Emissions Vehicle (LEV) regulations to reduce criteria air pollutants and GHG emissions from light- and medium-duty vehicles; and the Zero-Emissions Vehicle regulations (ZEV) to require manufactures to produce an increasing number of pure ZEV's (meaning battery and fuel cell electric vehicles) with the provision to produce plug-in hybrid electric vehicles (PHEV) between 2018 and 2025.

29 California Air Resources Board, 2017. Clean Car Standards – Pavley, Assembly Bill 1493, https://www.arb.ca.gov/cc/ccms/ccms.htm, last reviewed January 11, 2017.

Sustainable Communities and Climate Protection Act of 2008 (SB 375)
In 2008, SB 375 (Chapter 728, Statutes of 2008) established mechanisms for the development of regional targets for reducing passenger vehicle greenhouse gas emissions. Under SB 375, CARB is required, in consultation with the state's Metropolitan Planning Organizations (MPOs), to set regional GHG reduction targets for the passenger vehicle and light-duty truck sector for 2020 and 2035.[30]

Under SB 375, the regional reduction target must be incorporated within the applicable MPO's Regional Transportation Plan (RTP), which is used for long-term transportation planning, in a Sustainable Communities Strategy (SCS). Certain transportation planning and programming activities need to be consistent with the SCS, and consistency with the SCS can provide certain CEQA streamlining for proposed Community Plans; however, SB 375 expressly provides that the SCS does not regulate the use of land, and further provides that local land use plans and policies (e.g., general plan) are not required to be consistent with either the RTP or SCS.

In 2011, CARB adopted GHG emissions reduction targets for Merced County Association of Governments (MCAG), the Metropolitan Planning Organization (MPO) for Merced. In 2018, CARB updated the SB 375 targets to require an 8 percent reduction by 2020 and a 19 percent reduction by 2035 in per capita passenger vehicle GHG emissions.[31,32] The proposed reduction targets explicitly exclude emission reductions expected from the AB 1493 and the LCFS regulations.

Executive Order S-3-05
In 2005, Executive Order S-3-05 established the following GHG emission reduction targets:

- By 2010, California shall reduce GHG emissions to 2000 levels;
- By 2020, California shall reduce GHG emissions to 1990 levels; and
- By 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

Executive Order B-30-15
In 2015, Executive Order B-30-15:

- Established a new interim statewide reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030;
- Ordered all State agencies with jurisdiction over sources of GHG emissions to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 reduction targets; and
- Directed CARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent.

2017 CARB Climate Change Scoping Plan
A specific requirement of AB 32 was the preparation of a Climate Change Scoping Plan for achieving the maximum technologically feasible and cost-effective GHG emission reduction by 2020. CARB developed and approved the initial Scoping Plan in 2008, outlining the regulations, market-based approaches, voluntary measures, policies, and other emission reduction programs that would be needed to meet the 2020 statewide GHG emission limit and initiate the transformations needed to achieve the State's long-range climate objectives. The First Update

30 California Air Resources Board, 2018b. Sustainable Communities. Available: https://www.arb.ca.gov/cc/sb375/sb375-rd.htm.
31 California Air Resources Board (CARB), 2017b. California's 2017 Climate Change Scoping Plan. Available: www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. November 2017.
32 California Air Resources Board, 2018. SB 375 Regional Greenhouse Gas Emissions Reduction Targets. Available: https://www.arb.ca.gov/cc/sb375/finaltargets2018.pdf.

to the Scoping Plan was approved by CARB in 2014 and built upon the initial Scoping Plan with new strategies and recommendations and a revised target.

In response to SB 32 and the 2030 GHG reduction target, CARB approved the 2017 Climate Change Scoping Plan Update (2017 Scoping Plan Update) in 2017. The 2017 Scoping Plan Update outlines the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels. The 2017 Scoping Plan Update identifies key sectors of the State's implementation strategy, which includes improvements in low carbon energy, industry, transportation sustainability, natural and working lands, waste management, and water. Through a combination of data synthesis and modeling, CARB determined that the target statewide 2030 emissions limit is 260 $MMTCO_2e$, and that further commitments will need to be made to achieve an additional reduction of 50 $MMTCO_2e$ beyond current policies and programs. The cornerstone of the 2017 Scoping Plan Update is an expansion of the Cap-and-Trade Program (discussed further below) to meet the aggressive 2030 GHG emissions goal and ensure achievement of the 2030 limit set forth by E.O. B-30-15.

The 2017 Scoping Plan Update's strategy for meeting the State's 2030 GHG target incorporates the full range of legislative actions and State-developed plans that have relevance to the year 2030, including the following, described elsewhere in this section:

- Extending the LCFS beyond 2020 and increasing the carbon intensity reduction requirement to 18 percent by 2030;
- SB 350, described below;
- The 2016 Mobile Source Strategy is estimated to reduce emissions from mobile sources including a 45 percent reduction in statewide GHG emissions (from both on-road and off-road mobile sources) and a 50 percent reduction in statewide consumption of petroleum-based fuels;
- The Sustainable Freight Action Plan to improve freight efficiency and transition to zero-emission freight handling technologies (described in more detail below);
- SB 1383, which requires a 50 percent reduction in anthropogenic black carbon and a 40 percent reduction in hydrofluorocarbon and methane emissions below 2013 levels by 2030; and
- AB 398, which extends the State Cap-and-Trade Program through 2030.

In the 2017 Scoping Plan Update, CARB recommends statewide targets of no more than six MT CO_2e per capita by 2030 and no more than two metric tons CO_2e per capita by 2050. CARB acknowledges that because the statewide per capita targets are based on the statewide GHG emissions inventory that includes all emissions sectors in the state, they are not applicable for use at the local level. Rather, it is appropriate for local jurisdictions to derive evidence-based local per-capita goals based on local emissions sectors and growth projections.

To demonstrate how a local jurisdiction can achieve their long-term GHG goals at the community plan level, CARB recommends developing a geographically specific GHG reduction plan (i.e., climate action plan) consistent with the requirements of CEQA Guidelines section 15183.5(b). A so-called "CEQA-qualified" GHG reduction plan, once adopted, can provide local governments with a streamlining tool for project-level environmental review of GHG emissions, provided there are adequate performance metrics for determining project consistency with the plan. Absent conformity with such a plan, CARB recommends "that projects incorporate design features and GHG reduction measures, to the degree feasible, to minimize GHG emissions.

Achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development".[33]

In the fall of 2018, Merced County began development of a Climate Action Plan (CAP), which will outline a strategy for how the County will reduce its GHG emissions in accordance with statewide targets. However, progress on the plan has been significantly slowed due to the Coronavirus (Covid-19) pandemic.

SB 32/AB 197
In 2016, SB 32 and its companion bill AB 197, augmented AB 32 and amended HSC Division 25.5, establishing a new climate pollution reduction target of 40 percent below 1990 levels by 2030 and including provisions to ensure the benefits of State climate policies reach into disadvantaged communities.

Advanced Clean Cars Program
In 2012, CARB approved the Pavley II (LEV III) Advanced Clean Cars Program, an emissions-control scheme for model years 2015 through 2025 that allows manufacturers to comply with the 2017 through 2025 national standards while meeting State law. The program includes components to reduce smog-forming pollution, reduce GHG emissions, promote clean cars, and provide the fuels for clean cars. The ZEV program will act as the focused technology of the Advanced Clean Cars Program by requiring manufacturers to produce increasing numbers of ZEVs and plug-in hybrid electric vehicles (PHEV) in the 2018 to 2025 model years.[34]

Other Regulations that Reduce GHG Emissions at the State Level
There are a range of additional laws and regulations that address climate change and greenhouse gas reductions at a State level. These include:

- Executive Order S-14-08 – Expands RPS goal to 33 percent renewable by 2020;
- Senate Bill 350 – Expands RPS goal to 50 renewable percent by 2030;
- SB 100 (De León) (Chapter 312, Statutes of 2018)– Expands RPS goal to 60 percent renewable by 2030;
- Executive Order B-16-12 - 2025 Goal for Zero-Emission Vehicles – Establishes a goal of 1.5 million zero emission vehicles (ZEVs) by 2025;
- Mobile Source Strategy – Increases ZEV requirements to 4.2 million by 2030 as well as increased GHG reductions from on-road vehicles;
- Executive Order B-48-18 - 2030 Goal for Zero-Emission Vehicles – Established a 5 million ZEV goal by 2030; and
- SB 1383 – requires statewide reductions in short-lived climate pollutants across industrial sectors.

Air Quality Measures that Reduce GHG Emissions
Because some air pollutants are also greenhouse gases, some air quality-related measures will also reduce production of greenhouse gases. These include:

- Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling – reduces GHG emissions through the reduction of idling;

33 California Air Resources Board, 2017. California's 2017 Climate Change Scoping Plan. Available: www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. November 2017. pp. 100-101.
34 California Air Resources Board, 2017. California's 2017 Climate Change Scoping Plan. Available: www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. November 2017. pp. 100-101.

- Airborne Toxic Control Measure for Stationary CI Engines – Reduces GHG emissions through compliance with engine efficiency standards; and
- Regulations to Reduce Emissions of Diesel Particulate Matter, Nitrogen Oxides and other Criteria Air Pollutants, from In-Use Heavy-Duty Diesel-Fueled Vehicles – Reduces GHG emissions through more efficient on and off-road vehicle engines.

Regional

San Joaquin Valley Air Pollution Control District

The SJVAPCD has published Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects (SJVAPCD Guidance), as detailed in the *Thresholds of Significance* section below.

Merced County General Plan

The following policies from the General Plan[35] are relevant to GHG emissions generated by the proposed Community Plan**:**

Policy AQ-1.1: Energy Consumption Reduction
Encourage new residential, commercial, and industrial development to reduce air quality impacts from energy consumption.

Policy AQ-1.2: Business Energy Reduction Strategies
Encourage all businesses to: replace high mileage fleet vehicles with more efficient and/or alternative fuel vehicles; increase the energy efficiency of facilities; transition toward the use of renewable energy instead of non-renewable energy sources; adopt purchasing practices that promote emissions reductions and reusable materials; and increase recycling.

Policy AQ-1.5: Climate Action Plan
Prepare a Climate Action Plan that includes an inventory of 1990 and 2010 greenhouse gas emissions, determines project air quality impacts using analysis methods and significance thresholds recommended by the SJVAPC, and identify strategies to achieve State emission reduction targets.

Policy AQ-1.7: Heat Island Effect Reduction
Require increased tree canopy and reflective surface materials in order to reduce the heat island effect (i.e., increased temperatures due to heat radiation off paved surfaces and rooftops).

Policy AQ-1.8: Climate Change Adaptation
Prepare appropriate strategies to adapt to climate change based on peer-reviewed scientific findings of the potential impacts.

Policy AQ-1.9: Interagency Coordination
Coordinate with cities, regional, State, and Federal agencies and organizations to collaborate on a comprehensive approach to planning for climate change.

Policy AQ-1.10: Public Awareness
Increase public awareness about climate change and encourage county residents and

35 Merced County, *2030 Merced County General Plan,* December 10, 2013.

businesses to become involved in activities and lifestyle changes that will aid in reduction of greenhouse gas emissions.

Policy AQ-1.11: Truck-Related Development
Discourage development that causes significant increases in truck traffic on roads that are not capable of accommodating truck traffic due to pavement section deficiency or other capacity limitations, unless adequate mitigation through fees or improvements in required as part of the permit approval.

Policy AQ-2.5: Innovative Mitigation Measures
Encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the San Joaquin Valley Air Pollution Control District, project applicants, and other interested parties.

Policy AQ-2.7: Air District Best Performance Standards
Require the County to use the Best Performance Standards adopted by SJVAPCD during the development review and decision-making process to ensure new projects meet the targets set by the district.

Policy AQ-3.2: Clean Fleet Vehicles
Require vehicle replacement practices that prioritize the replacement of older higher emission vehicles and the purchasing of the lowest emission technology vehicles, consistent with cost-effective management of the program.

Policy AQ-3.3: Teleconferencing
Use teleconferencing in lieu of employee travel to conferences and meetings when feasible.

Policy AQ-3.5: Purchasing Preferences
Institute environmentally-responsible purchasing, including giving preference to products that reduce or eliminate indirect greenhouse gas emissions and promote recycling.

Policy AQ-4.1: Decrease Vehicle Miles Traveled
Require diverse, higher-density land uses (e.g., mixed-use and infill development) to decrease vehicle miles traveled.

Policy AQ-4.3: Public Transport Use Incentives
Prepare incentives and programs to encourage use of public transit and decrease vehicle miles traveled.

Policy AQ-4.4: Transportation Alternatives
Require employers and developers to provide employees and residents with attractive, affordable transportation alternatives, such as transit stops, van pool pick-up and drop-off locations, and biking paths/storage.

Policy AQ-4.5: Public Education and Awareness
Support programs that educate the public regarding the impact of individual transportation, lifestyle, and land use decisions on air quality.

Policy AQ-4.6: Non-Motorized Transportation
Encourage non-motorized transportation corridors within and between communities.

IMPACTS AND MITIGATION MEASURES

Method of Analysis

The construction and operational emissions associated with the proposed Community Plan are quantified using the following methodology. Consistent with CARB methodology and standard practice, the analysis uses the GWPs from IPCC's AR4 report to convert CH_4 and N_2O to CO_2e.

Construction

Construction anticipated by the proposed Community Plan may result in GHG emissions of CO_2 and smaller amounts of CH_4 and N_2O from construction equipment and mobile sources, such as haul trucks and worker vehicles. Construction emissions for the proposed Community Plan were estimated using the most recent version of the California Emissions Estimator Model (CalEEMod), version 2016.3.2, and California Emissions Factor Model (EMFAC), as applicable. Modeling was based on project-specific data, where available. Where project-specific information was not available default model settings and/or reasonable assumptions based on other similar projects were used to estimate criteria pollutant emissions. Modeling assumptions, calculations, and output files are provided in Appendix E.

The proposed Community Plan is a program-level document that does not have a specific development plan. The Winton Community Plan is intended to be built out over a fifteen-year period. However, to be conservative, during estimates of emissions it was assumed that ten percent of the Plan would be built out in one year. As a conservative assumption, the year 2020 was chosen for modeling purposes as construction equipment becomes more efficient in subsequent years.

Because the proposed Community Plan would not result in one large development, but provides for numerous smaller projects, there could be more than one project occurring at the same time during the year therefore increasing the amount of equipment used. As a conservative estimate of emissions, annual construction emissions are based on five year-long projects occurring at the same time in order to achieve ten percent of the development. Even if less than ten percent is built, it is possible that similar construction schedules could be used for the individual projects constructed.

Based on current practice and the fact that GHG emissions are a cumulative, rather than project specific impact, the total construction emissions for the proposed Community Plan will be amortized over a 30-year period and added to the operational emission estimates.

Operation

Operational emissions anticipated by the proposed Community Plan include emissions from energy use (electricity and natural gas), on-road motor vehicles (mobile), solid waste, water and wastewater, area sources (landscaping), and onsite stationary sources (emergency generators). Methodology for quantifying existing and future operational GHG emissions is detailed in Appendix E and summarized here.

Energy

The growth anticipated by the proposed Community Plan would consume energy (electricity and natural gas) for multiple purposes including, but not limited to, building heating and cooling, lighting, and electronics. For all land uses, building electricity and natural gas usage for existing uses were provided by the Pacific Gas and Electric Company. GHG emissions also take into account the Renewable Portfolio Standards (RPS) requirements.

Mobile Sources

Operations anticipated by the proposed Community Plan would include vehicle trips related to the operation of land uses. Mobile source emissions were calculated using VMT data provided in the traffic analysis (Appendix G), which takes into account VMT.

Solid Waste

Solid waste generation anticipated by the proposed Community Plan would include generation from day-to-day operational activities, which generally consists of product packaging, grass clippings, bottles, food scraps, newspapers, plastic, and other items routinely disposed of in trash bins. A portion of the waste is diverted to waste recycling and reclamation facilities. Waste that is not diverted is typically sent to local landfills for disposal, where it results in GHG emissions of CO_2 and CH_4 from the decomposition of the waste that occurs over the span of many years. The amount of solid waste generated by the proposed Community Plan was estimated using CalEEMod default generation rates.

Water and Wastewater

GHG emissions from water use and wastewater are associated with the electrical energy used to treat and transport the water. Emissions associated with the proposed Community Plan's anticipated operations were calculated based on water consumption and wastewater generation as estimated using CalEEMod defaults.

Thresholds of Significance

Based on the size and scope of the proposed Community Plan, an impact would be considered significant if the proposed Community Plan would:

- Generate GHG emissions, either directly or indirectly, that could have a significant impact on the environment; or
- Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

Amendments to Section 15064.4 of the State CEQA Guidelines were adopted to assist lead agencies in determining the significance of the impacts of GHG emissions. The amendments to Section 15064.4 do not establish a threshold of significance; rather they give lead agencies the discretion to determine whether to assess those emissions quantitatively or qualitatively. If a qualitative analysis is used, in addition to quantification, this section recommends certain qualitative factors that may be used in the determination of significance (i.e., extent to which a proposed project could increase or reduce GHG emissions compared to the existing environment; whether a project would exceed an applicable significance threshold; and the extent to which a project complies with regulations or requirements adopted to implement a reduction or mitigation of GHGs). Under amendments to Section 15064.4, lead agencies are further granted discretion to establish significance thresholds for their respective jurisdictions, including looking to thresholds developed by other public agencies, or suggested by other experts, such as the California Air Pollution Control Officers Association (CAPCOA), so long as any threshold chosen is supported by substantial evidence (see Section 15064.7(c)). The California Natural Resources Agency has also clarified that the Guidelines amendments focus on the effects of GHG emissions as cumulative impacts, and that they should be analyzed in the context of CEQA's requirements for cumulative impact analysis (see Section 15064(h)(3)).[36]

36 Governor's Office of Planning and Research (OPR), 2008. Technical Advisory on the California Environmental Quality Act and Climate Change. June 19.

Merced County has not established significance thresholds with respect to GHG emissions. Additionally, while Merced County is working on a climate action plan, one has not been completed or adopted. Merced County is under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAPCD also has not adopted significance thresholds; however, it has published Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects (SJVAPCD Guidance). According to the SJVAPCD Guidance, the District identifies a tiered approach for determining significance from GHG emissions as follows:

Tier 1: Project Exemption from CEQA.

Tier 2: Project complies with an adopted statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

Tier 3: The project achieves the 29 percent GHG Emissions Reduction Target by using approved Best Management Practices (BMPs).

Tier 4: GHG emissions are quantified and then mitigation is applied to reduce GHG emissions to 29 percent below business-as-usual (BAU).

With respect to this project, the Tier 1 approach cannot be used as, the proposed Community Plan is not exempt from CEQA. With respect to Tier 2, neither the State, nor the County of Merced has a qualified (verified and adopted) Climate Action Plan or other plan for reducing GHG emissions. Therefore, Tier 2 cannot be used for determining significance for the proposed Community Plan.

In light of recent court cases, specifically, Center for Biological Diversity v. California Department of Fish and Wildlife and Newhall Land and Farming (CBD vs. CDFW), the use of either Tier 3 or Tier 4 as significance thresholds also are not recommended.

The California Supreme Court questioned a common CEQA approach to GHG analyses for development projects that compares project emissions to the reductions from business-as-usual (BAU) that will be needed statewide to reduce emissions to 1990 levels by 2020, as required by AB 32. The court upheld the BAU method as valid in theory, but concluded that the BAU method was improperly applied in the case of the Newhall project because the target for the proposed Newhall Ranch project was incorrectly deemed consistent with the statewide emission target of 29 percent below BAU for the year 2020. In other words, the court said that the percent below BAU target developed by the AB 32 Scoping Plan is intended as a measure of the GHG reduction effort required by the State as a whole, and it cannot necessarily be applied to the impacts of a specific project in a specific location. The Court provided some guidance to evaluating the cumulative significance of a proposed land use project's GHG emissions, but noted that none of the approaches could be guaranteed to satisfy CEQA for a particular project. The Court's suggested "pathways to compliance" include:

1. Use a geographically specific GHG emission reduction plan (e.g., climate action plan) that outlines how the jurisdiction will reduce emissions consistent with State reduction targets, to provide the basis for streamlining project-level CEQA analysis, as described in CEQA Section 15183.5.
2. Use the Scoping Plan's BAU reduction goal, but provide substantial evidence to bridge the gap between the statewide goal and the proposed Community Plan's emissions reductions.
3. Assess consistency with AB 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce GHG emissions from particular activities; as

an example, the Court points out that projects consistent with an SB 375 Sustainable Community Strategy may need to reevaluate GHG emissions from cars and light trucks.

4. Rely on existing numerical thresholds of significance for GHG emissions, such as those developed by an air district.

As discussed previously, because there is not an existing qualified Climate Action Plan for the County, compliance pathway #1 is not a viable method for determining significance for this project.

Regarding compliance pathway #2, the Court acknowledged that "a business-as-usual comparison based on the Scoping Plan's methodology may be possible," and that "a lead agency might be able to determine what level of reduction from business as usual a new land use development at the proposed location must contribute in order to comply with statewide goals." However, in this case there is not sufficient information to assess whether the proposed Community Plan's emissions can be compared with the State target of 29 percent below BAU by 2020. Therefore, this approach is not applicable to this project.

Compliance pathway #3 requires the analysis to show how regulatory programs or performance-based standards apply to a project's emissions, but this type of analysis can be difficult, especially if some GHG-emitting elements of projects are covered by such standards and others are not. Transportation emissions in particular are not regulated by the Scoping Plan, because local government retains control over the location and density of residential and commercial development. Therefore, this approach is not applicable to this project.

Compliance pathway #4 is the most straightforward approach to analyze the proposed Community Plan. Although no formal significance threshold for GHG emissions associated with development-type land uses has been adopted by the County or SJVAPCD at this juncture, Section 15064.7(c) of the State CEQA Guidelines states "when adopting thresholds of significance, a lead agency may consider thresholds of significance previously adopted or recommended by other public agencies…" Both the Bay Area Air Quality Management District (BAAQMD) and South Coast Air Quality Management District (SCAQMD) have proposed efficiency thresholds per service population for projects. The BAAQMD published a threshold of 4.6 metric tons carbon dioxide equivalents ($MTCO_2e$) per year per service population for projects. In 2009 the SCAQMD proposed the same 4.6 $MTCO_2e$ threshold and in 2010 they proposed a revised threshold of 4.8 $MTCO_2e$.

The 4.6 $MTCO_2e$ threshold was derived by the BAAQMD and SCAQMD by taking the 2020 statewide GHG reduction target for land use of 295,530,000 $MTCO_2e$/year and dividing it by the total estimated statewide population plus employment (64,331,584). In 2010 the SCAQMD suggested that instead of the using the statewide employment values from all segments (e.g., land use, energy generation) that the employment values for land use only should be used in determining GHG emissions. This would change the service population (population plus employment) to 61,201,421. Dividing the GHG reduction target by the revised service population results in a per service population threshold of 4.8.

In addition, in 2010 the SCAQMD proposed a 2035 threshold of 3.0 $MTCO_2e$ per year per service population to be consistent with the reduction target of reducing GHG emissions to 40 percent below 1990 levels by 2035. The 40 percent below 1990 goals is consistent with the current State goals to reduce emissions, however the SCAQMD goal is set five years after the currently adopted State goals of reaching this level of reduction by 2030.

Because these thresholds are based on the statewide GHG emissions reduction targets, they would be valid throughout the state and not restricted to either the SCAQMD or BAAQMD's jurisdiction, but also represent a statewide efficiency measure and not one based on local GHG emissions.

Applying similar methodology to Merced County the threshold for 2020 would be 10.2 MT CO_2e annually.[37] Using the same methodology, a 2035 threshold of 3.9 $MTCO_2e$ would be applicable.[38] The State's GHG emission reduction targets are 40 percent below 1990 levels by 2030 and 80 percent below 1990 levels by 2050. As the Community Plan's buildout is 2035, the 2035 threshold ensures the Community Plan's emission reductions progress beyond the 2030 goal towards the 2050 goals. Therefore, a 2035 threshold of 3.9 was determined as a conservative step towards meeting the ultimate 2050 target. This threshold determination is provided in Appendix E to this document.

Cumulative Impacts and Mitigation Measures
An individual project in and of itself could not alter the climate globally, so climate change impacts are considered only from a cumulative perspective.

4.5-1 The proposed Community Plan would generate GHG emissions, either directly or indirectly, that could contribute to cumulative increases in greenhouse gas emissions and climate change.

Applicable Regulations: AB 32, SB 97, SB 375

Significance: Significant

Mitigation included in the proposed Community Plan:

- **Policy C-1.1: Multi-Modal Street Design -** The expansion, redesign, or construction of existing and new streets should accommodate pedestrians, bicycles, and transit where identified.
- **Policy C-2.1: Traffic Calming Measures -** Traffic calming measures (e.g. speed tables, bulb-outs) shall be implemented along Winton Way and other prioritized areas, to reduce vehicle speeds and improve pedestrian safety.
- **Policy C-3.1: Through Streets -** Dead-end streets shall be discouraged, while through streets are encouraged.
- **Policy C-4: Gateway and Construction Maintenance -** Private developers and/or service and community organizations shall contribute to the construction, design, and/or maintenance of gateway features.
- **Policy C-5.1: Provision of Pedestrian Amenities**- New and existing streets shall provide sidewalks, crosswalks, lighting, and other pedestrian amenities use to the greatest extent practical.
- **Policy C-5.2: Provisions of Pedestrian Facilities -** Existing public roadways shall be modified to include designated bicycle lanes.
- **Policy C-6.1: Locations -** Transit routes and stops shall be located within reasonable walking or biking distance of high activity land uses, residences, and public services. Additional coordination with MCAG is recommended for any expansion of services.

37 This uses the 2020 GHG emissions target of 35,00,000 $MTCO_2e$/year and divides that by the service population (261,056 population plus 82,017 employees).
38 This takes the 2035 GHG emissions target of 1,750,000 $MTCO_2e$/year and divides that by the service population (357,496 population plus 96,913 employees).

- **Goal OCS-7: Location of Pocket Parks -** Ensure residences are within reasonable walking distance (5 minutes or a maximum of 1/4 mile) of each existing and/or proposed pocket park. Pocket parks should be accessible without it being necessary to cross a collector road.

Significance after Mitigation in the proposed Community Plan: Significant

Mitigation: Implement Mitigation Measure 4.2-1 (see Section 4.2, Air Quality) and Mitigation Measure 4.5-1, below.

Prior to approval of a Vesting Subdivision Map, major subdivision application or discretionary permit application for a non-residential development, the applicant shall provide a detailed analysis of anticipated GHG emissions attributable to that project. Where individual project emissions exceed 3.9 MT CO_2e annually, measures shall be identified to reduce project emissions below the target level or by a minimum of 12.22 percent beyond emission reductions achieved by consistency with the Community Plan. Or, if a certified Climate Action Plan has been adopted by the County, the applicant shall demonstrate that the project is consistent with the CAP. If a project cannot achieve the targets, then it shall still implement measures to reduce project emissions to the extent feasible for that project. Measures to reduce project GHG emissions may include, but are not limited to the following:

(a) ***Climate Action Plan Compliance:*** *The project may comply with a locally adopted qualified Climate Action Plan if one has been adopted prior to the implementation of the individual development.*[39]

(b) ***Implement Appendix J of the Final Staff Report*** *– Climate Action Plan: Addressing GHG Emission Impacts under CEQA*[40]*, or a newer version as applicable, to the reduce emissions to below the regional thresholds.*

(c) ***Implement CAPCOA Mitigation Measures*** *– California Air Pollution Control Officers Association's Quantifying Greenhouse Gas Mitigation Measures, or a newer version as applicable.*

(d) ***Area Source Emissions Reductions****: Implement the following to reduce GHG Area source emissions:*

i. No residential development shall include a fireplace.

ii. For commercial and residential development, electrical outlets shall be provided on the exterior of all buildings.

(e) ***Project-Specific TDM Program.*** *Develop a TDM Program for onsite workers. Individual employers would be responsible for funding and overseeing the trip reduction/TDM programs. It is suggested that Community businesses work together to promote and enhance the VMT offsets that would occur from TDM Program implementation. TDM strategies may include, but are not limited to, the following:*

i. Establishment of carpool, bus pool, or vanpool programs;

ii. Cash allowances, passes or other public transit subsidies and purchase incentives;

39 While the SJVAPCD has adopted a Climate Action Plan, it is based on the 29 percent reduction from BAU which was contested by recent court cases and invalidated for project compliance. Therefore, unless SJVAPCD updates or revises the Climate Action Plan with respect to the new court decisions, it is not recommended that the current SJVAPCD Climate Action Plan be used for compliance determination.

40 SJVAPCD. 2009 *Final Staff Report- Climate Action Plan: Addressing GHG Emissions Impacts Under CEQA.* December 17. Available: http://www.valleyair.org/Programs/CCAP/CCAP_idx.htm

iii. Computerized commuter rideshare matching services;
iv. Guaranteed ride-home program for ridesharing;
v. Encourage telecommuting and alternative work schedules where feasible; and
vi. Designation of a community transportation coordinator for the local businesses.

(f) ***Community Wide TDM Program.*** *Develop a TDM Program for the Winton Community. TDM strategies may include, but are not limited to, the following:*

i. Establishment of carpool, buspool, or vanpool programs;

ii. Cash allowances, passes or other public transit subsidies and purchase incentives;

iii. Computerized commuter rideshare matching services;

iv. Guaranteed ride-home program for ridesharing;

v. Encourage telecommuting and alternative work schedules where feasible; and

vi. Designation of a community transportation coordinator for the local businesses.

(g) ***Recycling Requirement.*** *To the maximum practical extent, recyclable materials, from operation and construction activities, will be reused or recycled.*

Residual Significance: Significant and Unavoidable

Development anticipated by the proposed Community Plan would result in a significant impact, if the proposed Community Plan conflicts with the adopted State and local regulations and programs for reducing GHG emissions as detailed under Impact 4.5-2, Annual Project Construction GHG Emissions, below as well as exceeds the 2035 threshold of 3.9 $MTCO_2e$ annually. As discussed above, an individual project in and of itself could not alter the climate globally, so climate change impacts are considered only from a cumulative perspective, and therefore, the following evaluations are considered both project and cumulative.

Construction and Operation GHG Emissions

Construction and operational activities anticipated by the proposed Community Plan would emit GHGs that could, in combination with other regional and global emissions, result in an increase in CO_2e emissions that may result in changes in local and global climate. The following emissions were calculated for the potential construction and operation of the proposed Community Plan. Table 4.5-2 shows construction emissions on an amortized annual basis.

Table 4.5-3, Total Annual Project GHG Emissions, shows the forecasted GHG emissions for operation of the proposed Community Plan. Based on current methodology, construction emissions are added to operational emissions to determine a total annual emissions inventory.

The CAFE Standards, AB 1493, LCFS, and CARB's Advanced Clean Car Program will reduce impacts from future transportation throughout the County by increasing fuel efficiency of vehicles and promoting the use of Zero-Emission vehicles. Sustainable Communities and Climate Protection Act of 2008 requires the regional reduction in VMTs, which will reduce mobile emission generations from the proposed Community Plan. SB 1078 and SB 350 will reduce impacts from energy consumption by requiring electrical providers to use renewable resources for up to 50 percent of the electrical generation by 2030. California Building

TABLE 4.5-2
Annual Project Construction GHG Emissions

Phase	$MTCO_2e$
Residential	1,495
Shopping Center	430
General Office	92
Industrial	496
TOTAL Annual Emissions	**2,513**
TOTAL Project Emissions	**37,700**
Amortized (30 year) Emissions	**1,257**

SOURCE: ESA, 2020 (Appendix E).

TABLE 4.2-3
Total Annual Project GHG Emissions

	$MTCO_2e$		
Sector	**Unmitigated**	**Community Plan/General Plan Consistency**	**Mitigated**
Area	751	751	20
Energy	5,379	5,307	752
Mobile	31,559	30,125	30,713
Waste	627	531	531
Water	524	419	419
Total Operational Emissions	**38,840**	**37,134**	**32,435**
Amortized Construction Emissions	1,257	1,257	1,257
TOTAL Annual Emissions	**40,097**	**38,391**	**33,692**
Service Population	**8,641**		
Emissions per service population	**4.6**	**4.4**	**3.9**
Threshold	**3.9**		
Exceed Threshold?	**Yes**	**Yes**	**No**

SOURCE: ESA, 2020 (Appendix E).

Implementation of the Community Plan goals and policies as well as Mitigation Measures 4.2-1 and Mitigation Measure 4.5-1, would reduce GHG emissions as identified in Table 4.2-3. Mitigation Measure 4.2-1 would reduce air pollutants from both construction and operations, including some air pollutants that are also greenhouse gases. As shown in Table 4.5-3, emissions from the Community Plan can be reduced to the per service population emissions threshold. These reduced GHG emissions take into account the minimum reductions that can be achieved by implementation of the Community Plan policies as well as the minimum amount of mitigation needed to reach the per service population threshold. These calculations demonstrate the feasibility of reducing emissions to the threshold, but are not necessarily the total reductions that will occur as the Community Plan policies are fully realized and individual projects implement measures to achieve their emission reduction requirements. Further, these reductions do not take into account additional measures that will be taken by the State and local jurisdictions to reduce GHG emissions to meet the 2030 requirements and move towards the 2050 goals. Because the full scope of the Community Plan, including the type and size of

individual projects, as well as the nature and extent of the reductions implemented are unknown, the full potential of reductions associated with implementation of Mitigation Measures 4.2-1 and 4.5-1 cannot be quantified at this time.

As indicated above, compliance with the Community Plan strategies and Mitigation Measure 4.5-1 should reduce the GHG impacts to a less-than-significant level, but the timing and requirements of such strategies are unknown. Because this is a Plan level document and the full plans for the developments to occur is not known, the feasibility of achieving the emissions reduction targets by individual projects is uncertain at this time. Additionally, future requirements through a CAP or similar plan that may be implemented before the Community Plan is built out are also unknown. Therefore, the project contribution toward cumulative GHG emissions is considered significant and unavoidable.

4.5-2: The proposed Community Plan could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

Applicable Regulations: AB 32, SB 97, SB 375

Significance: Significant

Mitigation included in the proposed Community Plan: Policies C-1.1; C- 2.1; C-3.1; C-4; C-5.1; C-5.2; C-6.1; Goal OSC-7 as detailed under Impact 4.5-1 above.

Significance after Mitigation in the proposed Community Plan: Significant

Mitigation: Implement Mitigation Measure 4.2-1 and 4.5-1

Residual Significance: Less than Significant

Consistency with 2017 Scoping Plan Update
The proposed Community Plan would be consistent with key State plans and regulatory requirements referenced in the 2017 Scoping Plan Update designed to reduce statewide emissions. According to the 2017 Scoping Plan Update, reductions needed to achieve the 2030 target are expected to be achieved by increasing the RPS to 50 percent of the State's electricity by 2030, greatly increasing the fuel economy of vehicles and the number of zero-emission or hybrid vehicles, reducing the rate of growth in VMT, supporting high speed rail and other alternative transportation options, and increasing the use of high efficiency appliances, water heaters, and HVAC systems. The proposed Community Plan would not impede implementation of these potential reduction strategies identified by CARB, and it would benefit from statewide and utility-provider efforts towards increasing the portion of electricity provided from renewable resources. The proposed Community Plan would also benefit from statewide efforts towards increasing the fuel economy standards of vehicles and reducing the carbon content of fuels. The proposed Community Plan would utilize energy efficient appliances and equipment, as required by Title 24. For these reasons described above, the proposed Community Plan emissions trajectory would decline over time, consistent with the 2017 Scoping Plan Update.

MCTC's 2018 RTP/SCS
Due to the rural nature of the proposed Community Plan, it may not actively support increased transit use as there is no local train service and bus routes may not be within walking distance of all of the developments within the proposed Community Plan. Therefore, while the proposed Community Plan does not actively conflict with the implementation of the RTP/SCS, the proposed Community Plan also does not further the State's ability to reach the State goals. The proposed Community Plan as designed does not conflict with the following goals of the

RTP/SCS.

Goal 9 of the 2018 RTP/SCS aims to protect the environment and health of County residents by improving air quality and encouraging active transportation (non-motorized transportation such as bicycling and walking). The implementation of the proposed Community Plan will place residential uses in local proximity to parks, open space, commercial and retail uses, therefore reducing the need for motorized vehicles to access local recreation, amenities, and services. In addition, the proposed Community Plan provides for additional bike lanes and sidewalks throughout the community.

Executive Order S-3-05

Executive Order No. S-3-05 established a long-term goal of reducing California's GHG emissions to 80 percent below the 1990 level by the year 2050. The extent to which GHG emissions from mobile sources indirectly attributed to the proposed Community Plan would change in the future depends on the quantity (e.g., number of vehicles, average daily mileage) and quality (i.e., carbon content) of fuel that would be available and required to meet both regulatory standards, and resident and worker needs.

Renewable power requirements, LCFS, and vehicle emissions standards, discussed above, would decrease GHG emissions per unit of energy delivered or per VMT. Due to the uncertainty of technological advancements that could be anticipated over the next 30 years and the unknown parameters of the regulatory framework in 2050, further quantitative analysis of the proposed Community Plan impacts relative to the 2050 target would be speculative. Section 15145 of the CEQA Guidelines directs that "[i]f, after thorough investigation, a Lead Agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact."

Even though the State has not provided a clear regulatory and technological roadmap to achieve the 2050 goal, it has demonstrated the potential pace at which emission reductions can be achieved through new regulations, technology deployments, and market developments. In developing the 2017 Scoping Plan Update, CARB, CEC, CPUC, and the California Independent System Operator (CAISO) commissioned a study to evaluate the feasibility and cost of meeting the 2030 target along the way to reaching the State goal of reducing GHG emissions to 80% below 1990 levels by 2050. With input from these agencies, the California State Agencies' PATHWAYS Project explores scenarios for meeting the State long-term GHG emissions targets, encompassing the entirety of California economy with detailed representations of the buildings, industry, transportation, and electricity sectors. While acknowledging the inherent uncertainty associated with its modeling assumptions, the PATHWAYS study emphasizes the need for significant action and continued policy development by the State to support low-carbon technologies and markets for energy efficiency, building electrification, renewable electricity, zero-emission vehicles, and renewable liquid fuels. The study underscores the need for a periodic review of State policies and programs for reducing GHG emissions, as was anticipated by AB 32 in its directive to update the Scoping Plan at least every five years.

A 2018 update to the PATHWAYS study advanced the understanding of what is required for technology deployment and other GHG mitigation strategies if California is to meet its long-term climate goals. The 2018 study concludes that to achieve high levels of consumer adoption of zero-carbon technologies, particularly of electric vehicles and energy efficiency and electric heat in buildings, market transformation is needed to reduce the capital cost and to increase the range of options available. This market transformation can be facilitated by 1) higher carbon prices (which can be created by the Cap and Trade and LCFS programs); 2) codes and standards, regulations and direct incentives, to reduce the upfront cost to the customer; and 3) business and policy innovations to make zero-carbon technology options the cheaper, preferred

solutions compared to fossil fueled alternatives.

Statewide efforts are underway to facilitate the achievement of the EO S-3-05 goals. It is reasonable to expect the GHG emissions from development anticipated by the proposed Community Plan would decline over time, as the regulatory initiatives identified by CARB in the 2017 Scoping Plan Update are implemented, and other technological innovations occur. Given the reasonably anticipated decline in project emissions, the proposed Community Plan would not conflict with or interfere with the ability of the State to achieve the 2050 horizon-year goal of EO S-3-05.

Merced County General Plan

The Merced County General Plan has several policies that specifically identify measures to reduce GHG emissions. The proposed Community Plan would comply with the policies outlined in the regulatory section to the extent applicable to the proposed Community Plan. Therefore, the proposed Community Plan would be consistent with the Merced County General Plan policies and this impact would be less than significant.