5.8 GREENHOUSE GAS EMISSIONS

This section of the Draft Environmental Impact Report (DEIR) evaluates the potential for implementation of the proposed project to cumulatively contribute to greenhouse gas (GHG) emissions impacts. Because no single project is large enough to result in a measurable increase in global concentrations of GHG, climate change impacts of a project are considered on a cumulative basis.

This evaluation is based on the methodology recommended by the South Coast Air Quality Management District (South Coast AQMD). GHG emissions modeling was conducted using the California Emissions Estimator Model (CalEEMod), Version 2020.4.0, and model outputs are in Appendix C of this DEIR.

Terminology

The following are definitions for terms used throughout this section.

- **Greenhouse gases (GHG).** Gases in the atmosphere that absorb infrared light, thereby retaining heat in the atmosphere and contributing to a greenhouse effect.
- **Global warming potential (GWP).** Metric used to describe how much heat a molecule of a greenhouse gas absorbs relative to a molecule of carbon dioxide (CO_2) over a given period of time (20, 100, and 500 years). CO_2 has a GWP of 1.
- **Carbon dioxide-equivalent (CO_2e).** The standard unit to measure the amount of greenhouse gases in terms of the amount of CO_2 that would cause the same amount of warming. CO_2e is based on the GWP ratios between the various GHGs relative to CO_2.
- **$MTCO_2e$.** Metric ton of CO_2e.
- **$MMTCO_2e$.** Million metric tons of CO_2e.

5.8.1 Environmental Setting

5.8.1.1 GREENHOUSE GASES AND CLIMATE CHANGE

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHGs, to the atmosphere. The primary source of these GHGs is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHGs—water vapor, carbon dioxide (CO_2), methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed in the 20th and 21st centuries. Other GHGs identified by the IPCC that contribute to global warming to a lesser extent are nitrous oxide (N_2O), sulfur hexafluoride (SF_6),

hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (IPCC 2001).[1,2] The major GHGs applicable to the proposed project are briefly described.

- **Carbon dioxide (CO_2)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g., manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.

- **Methane (CH_4)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in landfills and water treatment facilities.

- **Nitrous oxide (N_2O)** is emitted during agricultural and industrial activities as well as during the combustion of fossil fuels and solid waste.

GHGs are dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Some GHGs have a stronger greenhouse effect than others. These are referred to as high GWP gases. The GWP of GHG emissions are shown in Table 5.8-1, *GHG Emissions and Their Relative Global Warming Potential Compared to CO_2*. The GWP is used to convert GHGs to CO_2-equivalence (CO_2e) to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. For example, under IPCC's Fifth Assessment Report (AR5) GWP values for CH_4, a project that generates 10 MT of CH_4 would be equivalent to 280 MT of CO_2.[3]

[1] Water vapor (H_2O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant because it is considered part of the feedback loop rather than a primary cause of change.

[2] Black carbon contributes to climate change both directly, by absorbing sunlight, and indirectly, by depositing on snow (making it melt faster) and by interacting with clouds and affecting cloud formation. Black carbon is the most strongly light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Reducing black carbon emissions globally can have immediate economic, climate, and public health benefits. California has been an international leader in reducing emissions of black carbon, with close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities (CARB 2017a). However, state and national GHG inventories do not include black carbon due to ongoing work resolving the precise global warming potential of black carbon. Guidance for CEQA documents does not yet include black carbon.

[3] CO_2-equivalence is used to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. The global warming potential of a GHG is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

Table 5.8-1 GHG Emissions and Their Relative Global Warming Potential Compared to CO_2

GHGs	Carbon Dioxide (CO_2)	Methane[1] (CH_4)	Nitrous Oxide (N_2O)
Second Assessment			
Atmospheric Lifetime (Years)	50 to 200	12 (±3)	120
Global Warming Potential Relative to CO_2[2]	1	21	310
Fourth Assessment			
Atmospheric Lifetime (Years)	50 to 200	12	114
Global Warming Potential Relative to CO_2[2]	1	25	298
Fifth Assessment[3]			
Atmospheric Lifetime (Years)	50 to 200	12	121
Global Warming Potential Relative to CO_2[2]	1	28	265

Sources: IPCC 1995; IPCC 2007; IPCC 2013.

1 The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

2 Based on 100-year time horizon of the GWP of the air pollutant compared to CO_2.

3 The GWP values in the IPCC's Fifth Assessment Report (IPCC 2013) reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO_2. However, the Fourth Assessment Report's GWPs were used to maintain consistency with statewide GHG emissions modeling in CalEEMod. In addition, the 2017 Scoping Plan Update was based on the AR4 GWP values.

California's GHG Sources and Relative Contribution

In 2021, the statewide GHG emissions inventory was updated for 2000 to 2019 emissions using the GWPs in IPCC's AR4 (IPCC 2007). Based on these GWPs, California produced 418.2 $MMTCO_2e$ of GHG emissions in 2019. California's transportation sector was the single largest generator of GHG emissions, producing 39.7 percent of the state's total emissions. Industrial sector emissions made up 21.1 percent, and electric power generation made up 14.1 percent of the state's emissions inventory. Other major sectors of GHG emissions include commercial and residential (10.5 percent), agriculture and forestry (7.6 percent), high-GWP gases (4.9 percent), and recycling and waste (2.1 percent) (CARB 2021).

Since the peak level in 2004, California statewide GHG emissions dropped below the 2020 GHG limit of 418.2 $MMTCO_2e$ in 2016 and have remained below the 2020 GHG limit since then. In 2019, emissions from routine GHG-emitting activities statewide were almost 13 $MMTCO_2e$ lower than the 2020 GHG limit. Per-capita GHG emissions in California have dropped from a 2001 peak of 14.0 $MTCO_2e$ per person to 10.5 $MTCO_2e$ per person in 2019, a 25 percent decrease. Transportation emissions continued to decline in 2019 as they had done in 2018, with even more substantial reductions due to a significant increase in renewable diesel. Since 2008, California's electricity sector has followed an overall downward trend in emissions. In 2019, solar power generation continued its rapid growth since 2013. Emissions from high-GWP gases comprised 4.9 percent of California's emissions in 2019. This continues the increasing trend as the gases replace ozone-depleting substances being phased out under the 1987 Montreal Protocol. Overall trends in the inventory also demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross domestic product) has declined 45 percent since the 2001 peak, though the state's gross domestic product grew 63 percent during this period (CARB 2021).

Human Influence on Climate Change

For approximately 1,000 years before the Industrial Revolution, the amount of GHGs in the atmosphere remained relatively constant. During the 20th century, however, scientists observed a rapid change in the climate and the quantity of climate change pollutants in the Earth's atmosphere that is attributable to human activities. The amount of CO_2 in the atmosphere has increased by more than 35 percent since preindustrial times and has increased at an average rate of 1.4 parts per million per year since 1960, mainly due to combustion of fossil fuels and deforestation (IPCC 2007). These recent changes in the quantity and concentration of climate change pollutants far exceed the extremes of the ice ages, and the global mean temperature is warming at a rate that cannot be explained by natural causes alone. Human activities are directly altering the chemical composition of the atmosphere through the buildup of climate change pollutants (CAT 2006). In the past, gradual changes in the earth's temperature changed the distribution of species, availability of water, etc. However, human activities are accelerating this process so that environmental impacts associated with climate change no longer occur in a geologic time frame but within a human lifetime (IPCC 2007).

Like the variability in the projections of the expected increase in global surface temperatures, the environmental consequences of gradual changes in the Earth's temperature are also hard to predict. Projections of climate change depend heavily upon future human activity. Therefore, climate models are based on different emission scenarios that account for historical trends in emissions and on observations of the climate record that assess the human influence of the trend and projections for extreme weather events. Climate-change scenarios are affected by varying degrees of uncertainty. For example, there are varying degrees of certainty on the magnitude of the trends for:

- Warmer and fewer cold days and nights over most land areas.
- Warmer and more frequent hot days and nights over most land areas.
- An increase in frequency of warm spells/heat waves over most land areas.
- An increase in frequency of heavy precipitation events (or proportion of total rainfall from heavy falls) over most areas.
- Larger areas affected by drought.
- Intense tropical cyclone activity increases.
- Increased incidence of extreme high sea level (excluding tsunamis).

Potential Climate Change Impacts for California

Observed changes over the last several decades across the western United States reveal clear signs of climate change. Statewide, average temperatures increased by about 1.7°F from 1895 to 2011, and warming has been greatest in the Sierra Nevada (CCCC 2012). The years from 2014 through 2016 showed unprecedented

temperatures, with 2014 being the warmest (OEHHA 2018). By 2050, California is projected to warm by approximately 2.7°F above 2000 averages, a threefold increase in the rate of warming over the last century. By 2100, average temperatures could increase by 5.6 to 8.8°F, depending on emissions levels (CNRA 2019).

In California and western North America, observations of the climate have shown: 1) a trend toward warmer winter and spring temperatures; 2) a smaller fraction of precipitation falling as snow; 3) a decrease in the amount of spring snow accumulation in the lower- and middle-elevation mountain zones; 4) advanced shift in the timing of snowmelt of 5 to 30 days earlier in the spring; and 5) a similar shift (5 to 30 days earlier) in the timing of spring flower blooms (CAT 2006). Overall, California has become drier over time, with five of eight years of severe to extreme drought occurring between 2007 and 2016, and unprecedented dry years in 2014 and 2015 (OEHHA 2018). Statewide precipitation has become increasingly variable from year to year, with the driest consecutive four years from 2012 to 2015 (OEHHA 2018). According to the California Climate Action Team—a committee of state agency secretaries and the heads of agencies, boards, and departments, led by the Secretary of the California Environmental Protection Agency—even if we could immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes (see Table 5.8-1), and the inertia of the Earth's climate system could produce as much as 0.6°C (1.1°F) of additional warming. Consequently, some impacts from climate change are unavoidable. Global climate change risks to California are shown in Table 5.8-2, *Summary of GHG Emissions Risks to California*, and include impacts to public health, water resources, agriculture, coastal sea level, forest and biological resources, and energy.

Table 5.8-2 Summary of GHG Emissions Risks to California

Impact Category	Potential Risk
Public Health Impacts	Heat waves will be more frequent, hotter, and longer Fewer extremely cold nights Poor air quality made worse Higher temperatures increase ground-level ozone levels
Water Resources Impacts	Decreasing Sierra Nevada snow pack Challenges in securing adequate water supply Potential reduction in hydropower Loss of winter recreation
Agricultural Impacts	Increasing temperature Increasing threats from pests and pathogens Expanded ranges of agricultural weeds Declining productivity Irregular blooms and harvests
Coastal Sea Level Impacts	Accelerated sea level rise Increasing coastal floods Shrinking beaches Worsened impacts on infrastructure
Forest and Biological Resource Impacts	Increased risk and severity of wildfires Lengthening of the wildfire season Movement of forest areas Conversion of forest to grassland Declining forest productivity

Table 5.8-2 Summary of GHG Emissions Risks to California

Impact Category	Potential Risk
	Increasing threats from pest and pathogens Shifting vegetation and species distribution Altered timing of migration and mating habits Loss of sensitive or slow-moving species
Energy Demand Impacts	Potential reduction in hydropower Increased energy demand

Sources: CEC 2006; CEC 2009; CCCC 2012; CNRA 2014.

Specific climate change impacts that could affect the project include:

- **Water Resources Impacts.** By late this century, all projections show drying, and half of the projections suggest 30-year average precipitation will decline by more than 10 percent below the historical average. This drying trend is caused by an apparent decline in the frequency of rain and snowfall. Even in projections with relatively small or no declines in precipitation, central and southern parts of the state can be expected to be drier from the warming effects alone—the spring snowpack will melt sooner, and the moisture in soils will evaporate during long dry summer months (CCCC 2012).

- **Wildfire Risks.** Earlier snowmelt, higher temperatures, and longer dry periods over a longer fire season will directly increase wildfire risk. Indirectly, wildfire risk will also be influenced by potential climate-related changes in vegetation and ignition potential from lightning. Human activities will continue to be the biggest factor in ignition risk. The number of large fires statewide is estimated to increase from 58 percent to 128 percent above historical levels by 2085. Under the same emissions scenario, estimated burned area will increase by 57 percent to 169 percent, depending on location (CCCC 2012).

- **Health Impacts.** Many of the gravest threats to public health in California stem from the increase of extreme conditions—principally, more frequent, more intense, and longer heat waves. Particular concern centers on the increasing tendency for multiple hot days in succession and simultaneous heat waves in several regions throughout the state. Public health could also be affected by climate change impacts on air quality, food production, the amount and quality of water supplies, energy pricing and availability, and the spread of infectious diseases. Higher temperatures also increase ground-level ozone levels. Furthermore, wildfires can increase particulate air pollution in the major air basins of California (CCCC 2012).

- **Increase Energy Demand.** Increases in average temperature and higher frequency of extreme heat events combined with new residential development across the state will drive up the demand for cooling in the increasingly hot and longer summer season and decrease demand for heating in the cooler season. Warmer, drier summers also increase system losses at natural gas plants (reduced efficiency in the electricity generation process at higher temperatures) and hydropower plants (lower reservoir levels). Transmission of electricity will also be affected by climate change. Transmission lines lose 7 percent to 8 percent of transmitting capacity in high temperatures while needing to transport greater loads. This means that more electricity will need to be produced to make up for both the loss in capacity and the growing demand (CCCC 2012).

5.8.1.2 REGULATORY BACKGROUND

This section describes the federal, state, and local regulations applicable to GHG emissions.

Federal Laws

United States Environmental Protection Agency

The US Environmental Protection Agency (EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 US Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings did not themselves impose any emission reduction requirements, but allowed the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation (USEPA 2009).

To regulate GHGs from passenger vehicles, EPA was required to issue an endangerment finding (US EPA 2022). The finding identifies emissions of six key GHGs—CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world. The first three are applicable to the proposed project's GHG emissions inventory because they constitute the majority of GHG emissions, and per South Coast AQMD guidance, are the GHG emissions that should be evaluated as part of a project's GHG emissions inventory.

US Mandatory Reporting Rule for GHGs (2009)

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 $MTCO_2e$ or more per year are required to submit an annual report.

Update to Corporate Average Fuel Economy Standards (2021 to 2026)

The federal government issued new Corporate Average Fuel Economy (CAFE) standards in 2012 for model years 2017 to 2025, which required a fleet average of 54.5 miles per gallon in 2025. However, on March 30, 2020, the EPA finalized updated CAFE and GHG emissions standards for passenger cars and light trucks and established new, less stringent standards covering model years 2021 through 2026, known as SAFE. However, a consortium of automakers and California agreed on a voluntary framework to reduce emissions as an alternate path forward for clean vehicle standards nationwide. Automakers who agreed to the framework are Ford, Honda, BMW of North America, and Volkswagen Group of America. In late 2020, GM and Nissan also agreed to the voluntary framework. The framework supports continued annual reductions of vehicle greenhouse gas emissions through the 2026 model year, encourages innovation to accelerate the transition to electric vehicles, and gives industry the certainty needed to make investments and create jobs. This commitment means that the auto companies party to the voluntary agreement will only sell cars in the United States that meet these standards (CARB 2019). In addition, per Executive Order 13990 (EO 13990) issued by President Biden on January 20, 2021, the EPA is reconsidering SAFE for the purpose

of rescinding the rule. The reconsideration process is ongoing after a public hearing held on June 2, 2021, which also started the public comment period that ended July 6, 2021. On August 5, 2021, the National Highway Traffic Safety Administration announced new proposed fuel standards in response to EO 13990. Fuel efficiency under the standards proposed would increase 8 percent annually for model years 2024 to 2026 and increase the estimated fleetwide average by 12 mpg for model year 2026 compared to model year 2021 (NHTSA 2021).

EPA Regulation of Stationary Sources under the Clean Air Act (Ongoing)

Pursuant to its authority under the Clean Air Act, the EPA has been developing regulations for new, large, stationary sources of emissions, such as power plants and refineries. Under former President Obama's 2013 Climate Action Plan, the EPA was directed to develop regulations for existing stationary sources as well. On June 19, 2019, the EPA issued the final Affordable Clean Energy rule, which was crafted under the direction of President Trump's Energy Independence EO and became effective August 19, 2019. It officially rescinded the Clean Power Plan rule issued during the Obama Administration and sets emissions guidelines for states in developing plans to limit CO_2 emissions from coal-fired power plants. However, the Affordable Clean Energy rule was vacated by the United States Court of Appeals for the District of Columbia Circuit on January 19, 2021. The Biden Administration is currently assessing options on potential future regulations.

State Laws

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in EO S-03-05 and B-30-15, Assembly Bill 32 (AB 32), Senate Bill 32 (SB 32), and SB 375.

Executive Order S-03-05

EO S-03-05, signed June 1, 2005, set the following GHG reduction targets for the state:

- 2000 levels by 2010
- 1990 levels by 2020
- 80 percent below 1990 levels by 2050

Assembly Bill 32, the Global Warming Solutions Act (2006)

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in the Global Warming Solutions Act. AB 32 was passed by the California state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in EO S-03-05.

CARB 2008 Scoping Plan

The first Scoping Plan was adopted by CARB on December 11, 2008. The 2008 Scoping Plan identified that GHG emissions in California are anticipated to be approximately 596 $MMTCO_2e$ in 2020. In December 2007, CARB approved a 2020 emissions limit of 427 $MMTCO_2e$ (471 million tons) for the state (CARB 2008). In order to effectively implement the emissions cap, AB 32 directed CARB to establish a mandatory

reporting system to track and monitor GHG emissions levels for large stationary sources that generate more than 25,000 $MTCO_2e$ per year, prepare a plan demonstrating how the 2020 deadline could be met, and develop appropriate regulations and programs to implement the plan by 2012.

First Update to the Scoping Plan

CARB completed a five-year update to the 2008 Scoping Plan, as required by AB 32. The First Update to the Scoping Plan was adopted at the May 22, 2014, board hearing. The update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the original 2008 Scoping Plan. As part of the update, CARB recalculated the 1990 GHG emission levels with the updated AR4 GWPs, and reset the 427 $MMTCO_2e$ 1990 emissions level and 2020 GHG emissions limit, established in response to AB 32, slightly higher at 431 $MMTCO_2e$ (CARB 2014).

As identified in the update to the Scoping Plan, California is on track to meeting the goals of AB 32. However, the update also addresses the state's longer-term GHG goals within a post-2020 element. The post-2020 element provides a high level view of a long-term strategy for meeting the 2050 GHG goals, including a recommendation for the state to adopt a midterm target. According to the Update to the Scoping Plan, local government reduction targets should chart a reduction trajectory that is consistent with or exceeds the trajectory created by statewide goals (CARB 2014). CARB identified that reducing emissions to 80 percent below 1990 levels will require a fundamental shift to efficient, clean energy in every sector of the economy. Progressing toward California's 2050 climate targets will require significant acceleration of GHG reduction rates. Emissions from 2020 to 2050 will have to decline several times faster than the rate needed to reach the 2020 emissions limit (CARB 2014).

Executive Order B-30-15

EO B-30-15, signed April 29, 2015, set a goal of reducing GHG emissions within the state to 40 percent of 1990 levels by year 2030. EO B-30-15 also directed CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and required state agencies to implement measures to meet the interim 2030 goal as well as the long-term goal for 2050 in EO S-03-05. It required the Natural Resources Agency to conduct triennial updates of the California adaption strategy, "Safeguarding California," to ensure climate change is accounted for in state planning and investment decisions.

Senate Bill 32 and Assembly Bill 197

In September 2016, Governor Brown signed SB 32 and AB 197, making the EO B-30-15 goal for year 2030 into a statewide mandated legislative target. AB 197 established a joint legislative committee on climate change policies and required CARB to prioritize direct emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

2017 Climate Change Scoping Plan Update

EO B-30-15 and SB 32 required CARB to prepare another update to the Scoping Plan to address the 2030 target for the state. On December 24, 2017, CARB approved the 2017 Climate Change Scoping Plan Update, which outlines potential regulations and programs, including strategies consistent with AB 197 requirements,

to achieve the 2030 target. The 2017 Scoping Plan establishes a new emissions limit of 260 $MMTCO_2e$ for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030 (CARB 2017b).

California's climate strategy will require contributions from all sectors of the economy, including enhanced focus on zero- and near-zero emission (ZE/NZE) vehicle technologies; continued investment in renewables such as solar roofs, wind, and other types of distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conserve agricultural and other lands. Requirements for GHG reductions at stationary sources complement local air pollution control efforts by the local air districts to tighten limits on emissions of criteria air pollutants and toxic air contaminants across a broad spectrum of industrial sources. Major elements of the 2017 Scoping Plan framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which includes increasing ZE buses and trucks.
- Increased stringency of the Low Carbon Fuel Standard (LCFS) (18 percent by 2030).
- Implementation of SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030.
- California Sustainable Freight Action Plan, which improves freight system efficiency, uses NZE technology, and deploys ZE trucks.
- Implementation of the proposed Short-Lived Climate Pollutant Strategy, which focuses on reducing methane and hydroflurocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030.
- Continued implementation of SB 375.
- Post-2020 Cap-and-Trade Program that includes declining caps.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

In addition to these statewide strategies, the 2017 Climate Change Scoping Plan identified local governments as essential partners in achieving the state's long-term GHG reduction goals and recommended local actions to reduce GHG emissions—for example, statewide targets of no more than 6 $MTCO_2e$ or less per capita by 2030 and 2 $MTCO_2e$ or less per capita by 2050. CARB recommends that local governments evaluate and adopt aggressive, quantitative, locally appropriate goals that align with the statewide per capita targets and sustainable development objectives, and develop plans to achieve the local goals. The statewide per capita goals were developed by applying the reduction percentages necessary to reach the 2030 and 2050 climate goals (i.e., 40 percent and 80 percent, respectively) to the state's 1990 emissions limit established under AB 32.

For CEQA projects, CARB states that lead agencies have discretion to develop evidenced-based numeric thresholds (mass emissions, per capita, or per service population) consistent with the Scoping Plan and the state's long-term GHG goals. To the degree a project relies on GHG mitigation measures, CARB recommends that lead agencies prioritize on-site design features that reduce emissions, especially from vehicle miles traveled (VMT), and direct investments in GHG reductions within the project's region that contribute potential air quality, health, and economic co-benefits. Where further project design or regional investments are infeasible or not proven to be effective, CARB recommends mitigating potential GHG impacts through purchasing and retiring carbon credits.

The Scoping Plan scenario is set against what is called the "business as usual" yardstick—that is, what would the GHG emissions look like if the state did nothing at all beyond the policies that are already required and in place to achieve the 2020 limit, as shown in Table 5.8-3, *2017 Climate Change Scoping Plan Emissions Reductions Gap to Achieve the 2030 GHG Target*. It includes the existing renewables requirements, advanced clean cars, the "10 percent" LCFS, the SB 375 program for more vibrant communities, etc. However, it does not include the new policies or measures that have been developed or put into statute over the past two years. Also shown in the table, the known commitments are expected to result in emissions that are 60 $MMTCO_2e$ above the target in 2030. If the estimated GHG reductions from the known commitments are not realized due to delays in implementation or technology deployment, the post-2020 Cap-and-Trade Program would deliver the additional GHG reductions in the sectors it covers to ensure the 2030 target is achieved.

Table 5.8-3 2017 Climate Change Scoping Plan Emissions Reductions Gap to Achieve the 2030 GHG Target

Modeling Scenario	2030 GHG Emissions $MMTCO_2e$
Reference Scenario (Business-as-Usual)	398
With Known Commitments	320
2030 GHG Target	**260**
Gap to 2030 Target	**60**

Source: CARB 2017b.

Table 5.8-4, *2017 Climate Change Scoping Plan Emissions Change by Sector to Achieve the 2030 Target*, provides estimated GHG emissions by sector at 1990 levels, and the range of emissions for each sector estimated for 2030.

Table 5.8-4 2017 Climate Change Scoping Plan Emissions Change by Sector to Achieve the 2030 Target

Scoping Plan Sector	1990 $MMTCO_2e$	2030 Proposed Plan Ranges $MMTCO_2e$	% Change from 1990
Agricultural	26	24-25	-4% to -8%
Residential and Commercial	44	38-40	-9% to -14%
Electric Power	108	30-53	-51% to -72%
High GWP	3	8-11	267% to 367%
Industrial	98	83-90	-8% to -15%
Recycling and Waste	7	8-9	14% to 29%
Transportation (including TCU)	152	103-111	-27% to -32%
Net Sink[1]	-7	TBD	TBD
Sub Total	431	294-339	-21% to -32%
Cap-and-Trade Program	NA	34-79	NA
Total	**431**	**260**	**-40%**

Source: CARB 2017b
Notes: TCU = Transportation, Communications, and Utilities; TBD: To Be Determined.
[1] Work is underway through 2017 to estimate the range of potential sequestration benefits from the natural and working lands sector.

Senate Bill 375

In 2008, SB 375, the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the 2008 Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 metropolitan planning organizations (MPO). The Southern California Association of Governments (SCAG) is the MPO for the Southern California region, which includes the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. Pursuant to the recommendations of the Regional Transportation Advisory Committee, CARB adopted per capita reduction targets for each of the MPOs rather than a total magnitude reduction target.

2017 Update to the SB 375 Targets

CARB is required to update the targets for the MPOs every eight years. CARB adopted revised SB 375 targets for the MPOs in March 2018. The updated targets became effective in October 2018 and were applicable to SCAG's 2019 update to the regional transportation plan / sustainable communities strategy (RTP/SCS). CARB's updated SB 375 targets for the SCAG region were an 8 percent per capita GHG reduction in 2020 from 2005 levels (unchanged from the 2010 target) and a 19 percent per capita GHG reduction in 2035 from 2005 levels (compared to the 2010 target of 13 percent) (CARB 2018).

The targets consider the need to further reduce VMT, as identified in the 2017 Scoping Plan Update (for SB 32), while balancing the need for additional and more flexible revenue sources to incentivize positive planning and action toward sustainable communities. Like the 2010 targets, the updated SB 375 targets are in units of

"percent per capita" reductions in GHG emissions from automobiles and light trucks relative to 2005; this excludes reductions anticipated from implementation of state technology and fuels strategies and any potential future state strategies, such as statewide road user pricing. The proposed targets call for greater per-capita GHG emission reductions from SB 375 than are currently in place, which for 2035 translate into proposed targets that either match or exceed the emission reduction levels in the MPOs' currently adopted SCSs to achieve the SB 375 targets. CARB foresees that the additional GHG emissions reductions in 2035 may be achieved from land use changes, transportation investment, and technology strategies (CARB 2018).

SCAG's 2016-2040 RTP/SCS

SB 375 required the MPOs to prepare a sustainable communities strategy in their regional transportation plans. For the SCAG region, the 2020-2045 RTP/SCS, *Connect SoCal*, was adopted on September 3, 2020, and is an update to the 2016-2040 RTP/SCS (SCAG 2020). In general, the RTP/SCS outlines a development pattern for the region that, when integrated with the transportation network and other transportation measures and policies, would reduce vehicle miles traveled from automobiles and light duty trucks and thereby reduce GHG emissions from these sources.

Connect SoCal focuses on the continued efforts of the previous RTP/SCSs to integrate transportation and land uses strategies in development of the SCAG region through horizon year 2045 (SCAG 2020). It forecasts that the SCAG region will meet its GHG per capita reduction targets of 8 percent by 2020 and 19 percent by 2035. It also forecasts that implementation of the plan will reduce VMT per capita in year 2045 by 4.1 percent compared to baseline conditions for that year. *Connect SoCal* includes a "Core Vision" that centers on maintaining and better managing the transportation network for moving people and goods; expanding mobility choices by locating housing, jobs, and transit closer together; and increasing investments in transit and complete streets (SCAG 2020).

Transportation Sector Specific Regulations

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and was anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model years 2017 through 2025 light-duty vehicles (see also the discussion on the update to the Corporate Average Fuel Economy standards under *Federal Laws*, above). In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combined the control of smog, soot, and GHGs and requirements for greater numbers of ZE vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions.

Executive Order S-01-07

On January 18, 2007, the state set a new LCFS for transportation fuels sold in the state. EO S-01-07 set a declining standard for GHG emissions measured in grams of CO_2e per unit of fuel energy sold in California. The LCFS required a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020. The standard applied to refiners, blenders, producers, and importers of transportation fuels, and used market-based mechanisms to allow these providers to choose the most economically feasible method to reduce emissions during the "fuel cycle."

Executive Order B-16-2012

On March 23, 2012, the state identified that CARB, the California Energy Commission (CEC), the Public Utilities Commission, and other relevant agencies worked with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate ZE vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations). The EO directed an increase in the number of ZE vehicles in California's state fleet through the normal course of fleet replacement, so that at least 10 percent of fleet purchases of light-duty vehicles would be ZE by 2015 and at least 25 percent by 2020. The EO also established a target for the transportation sector of reducing GHG emissions from the transportation sector 80 percent below 1990 levels.

Executive Order N-79-20

On September 23, 2020, Governor Newsom signed EO N-79-20 with the goal that 100 percent of in-state sales of new passenger cars and trucks will be ZE by 2035. Additionally, this EO identified fleet goals of 100 percent ZE drayage trucks by 2035 and 100 percent ZE medium- and heavy-duty vehicles in the state by 2045, for all operations where feasible. Additionally, the EO identifies a goal for the state to transition to 100 percent ZE off-road vehicles and equipment by 2035, where feasible.

Renewables Portfolio: Carbon Neutrality Regulations

Senate Bills 1078, 107, X1-2, and Executive Order S-14-08

A major component of California's Renewable Energy Program is the RPS established under Senate Bills 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. EO S-14-08 was signed in November 2008, which expanded the state's Renewable Energy Standard to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SBX1-2). Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects, because electricity production from renewable sources is generally considered carbon neutral.

Senate Bill 350

Senate Bill 350 (de Leon), was signed into law September 2015. SB 350 establishes tiered increases to the RPS of 40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100, which replaced the SB 350 requirements. Under SB 100, the RPS for public-owned facilities and retail sellers will consist of 44 percent renewable energy by 2024, 52 percent by 2027, and 60 percent by 2030. SB 100 also established a new RPS requirement of 50 percent by 2026. The bill also establishes an overall state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. Under the bill, the state cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order B-55-18

EO B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." EO B-55-18 directs CARB to work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other statewide goals, meaning not only should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

Energy Efficiency Regulations

California Building Code: Building Energy Efficiency Standards

Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission (now the CEC) in June 1977 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. The 2019 Building Energy Efficiency Standards were adopted on May 9, 2018, and went into effect on January 1, 2020.

The 2019 standards move toward cutting energy use in new homes by more than 50 percent and require installation of solar photovoltaic systems for single-family homes and multifamily buildings of three stories and less. The 2019 standards focus on four key areas: 1) smart residential photovoltaic systems; 2) updated thermal envelope standards (preventing heat transfer from the interior to exterior and vice versa); 3) residential and nonresidential ventilation requirements; 4) and nonresidential lighting requirements (CEC 2018b). Under the 2019 standards, nonresidential buildings are generally 30 percent more energy efficient than under the 2016 standards, and single-family homes are generally 7 percent more energy efficient (CEC 2018a). When accounting for the electricity generated by the solar photovoltaic system, single-family homes would generally use 53 percent less energy compared to homes built to the 2016 standards (CEC 2018a).

Furthermore, on August 11, 2021, the CEC adopted the 2022 Building Energy Efficiency Standards, which were subsequently approved by the California Building Standards Commission in December 2021. The 2022 standards become effective and replace the existing 2019 standards on January 1, 2023. The 2022 standards

would require mixed-fuel single-family homes to be electric-ready to accommodate replacement of gas appliances with electric appliances. In addition, the new standards also include prescriptive photovoltaic system and battery requirements for high-rise, multifamily buildings (i.e., more than three stories) and noncommercial buildings such as hotels, offices, medical offices, restaurants, retail stores, schools, warehouses, theaters, and convention centers (CEC 2021).

California Building Code: CALGreen

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (24 CCR, Part 11, known as "CALGreen") was adopted as part of the California Building Standards Code. CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.[4] The mandatory provisions of CALGreen became effective January 1, 2011, and were last updated in 2019. The 2019 CALGreen standards became effective January 1, 2020.

2006 Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (20 CCR secs. 1601–1608) were adopted by the CEC on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non–federally regulated appliances. Though these regulations are now often viewed as "business as usual," they exceed the standards imposed by all other states, and they reduce GHG emissions by reducing energy demand.

Solid Waste Diversion Regulations

AB 939: Integrated Waste Management Act of 1989

California's Integrated Waste Management Act of 1989 (Public Resources Code secs. 40050 et seq.) set a requirement for cities and counties throughout the state to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling, and composting. In 2008, the requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this, the act required that each city and county prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 341

AB 341 (Chapter 476, Statutes of 2011) increased the statewide goal for waste diversion to 75 percent by 2020 and required recycling of waste from commercial and multifamily residential land uses. Section 5.408 of CALGreen also requires that at least 65 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

[4] The green building standards became mandatory in the 2010 edition of the code.

AB 1327

AB 1327, the California Solid Waste Reuse and Recycling Access Act (Public Resources Code secs. 42900 et seq.) required areas to be set aside for collecting and loading recyclable materials in development projects. The act required the California Integrated Waste Management Board to develop a model ordinance for adoption by any local agency requiring adequate areas for collection and loading of recyclable materials as part of development projects. Local agencies are required to adopt the model or an ordinance of their own.

AB 1826

In October 2014 Governor Brown signed AB 1826 requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses and multifamily residential dwellings that consist of five or more units. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed in with food waste.

Water Efficiency Regulations

SBX7-7

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7th Extraordinary Session of 2009–2010 and therefore dubbed "SBX7-7." SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure water deliveries to customers, and implement other efficiency measures. SBX7-7 required urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

AB 1881: Water Conservation in Landscaping Act

The Water Conservation in Landscaping Act of 2006 required local agencies to adopt the updated DWR model ordinance or an equivalent. AB 1881 also required the CEC to consult with the DWR to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

Short-Lived Climate Pollutant Reduction Strategy

Senate Bill 1383

On September 19, 2016, the Governor signed SB 1383 to supplement the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants, including black carbon and CH_4. Black carbon is the light-absorbing component of fine particulate matter produced during incomplete combustion of fuels. SB 1383 required the state board, no later than January 1, 2018, to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve a reduction in

methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The bill also established targets for reducing organic waste in landfills. On March 14, 2017, CARB adopted the Short-Lived Climate Pollutant Reduction Strategy, which identifies the state's approach to reducing anthropogenic and biogenic sources of short-lived climate pollutants. Anthropogenic sources of black carbon include on- and off-road transportation, residential wood burning, fuel combustion (charbroiling), and industrial processes. According to CARB, ambient levels of black carbon in California are 90 percent lower than in the early 1960s, despite the tripling of diesel fuel use (CARB 2017a). In-use on-road rules were expected to reduce black carbon emissions from on-road sources by 80 percent between 2000 and 2020. South Coast AQMD is one of the air districts that requires air pollution control technologies for chain-driven broilers, which reduces their particulate emissions by over 80 percent (CARB 2017a). Additionally, South Coast AQMD Rule 445 limits installation of new fireplaces in the South Coast Air Basin.

Local

City of Brea Sustainability Plan

The City approved the Brea Sustainability Plan: Leadership in Energy Efficiency (Sustainability Plan) in fall 2012; it presents resource efficiency goals matched with policies and implementation steps to save energy, water, and other resources, aligning the city for AB 32 compliance (Brea 2012). The Sustainability Plan is based in part on the City's 2012 Greenhouse Gas Inventory results, which presents data for a 2010 baseline year, and on the Energy Action Plan prepared for the city in conjunction with SCE and the Energy Coalition. Though the Sustainability Plan is not a qualified climate action plan as defined under CEQA Guidelines Section 15183.5(b), it included goals and measures to support achieving an emissions reduction of 34,772 $MTCO_2e$ to reach the 1990 emissions level of 517,231 $MTCO_2e$ by year 2020 (Brea 2012).

To meet the defined goals and policies, the Sustainability Plan provided phased measures that included an implementation time frame and estimated CO_2 mitigation for the city. In general, the Sustainability Plan includes goals and measures that cover building energy efficiency, waste management and recycling, sustainable building practices, land use and transportation planning policy, public and active transit, and outreach. Overall, the Sustainability Plan includes 88 measures to achieve its emissions reduction target. These measures are divided over three implementation phases. Phase I, intended to be implemented between 2013 and 2014, consisted of 26 total measures that relied on ordinances, public education, utility programs, financing, and public/private partnerships. Implementation of these measures were estimated to reduce emissions throughout the city by 12,528 $MTCO_2e$. Phase II and III would be based on the City's economic conditions, additional regulation, technological advances, and financing options. These two phases built on the measures in Phase I, especially measures pertaining to development and mobility, to further progress toward sustainability through emissions reduction. Phase II included 46 measures implemented between 2015 and 2017 and projected to reduce emissions by 16,359 $MTCO_2e$. Phase III included 16 measures to be carried out between 2018 and 2020. Its implementation would result in a reduction of 6,257 $MTCO_2e$. In total, implementation of these three phases would achieve an emissions reduction of 35,144 $MTCO_2e$, which would exceed the reduction target of 34,772 $MTCO_2e$.

5.8.1.3 EXISTING CONDITIONS

The project site has been used for oil production continuously since the early 1900s. Of the approximately 190 wells drilled on the site, 110 remain in operation and produce approximately 500 barrels per day. Current emissions generated from the existing operations are associated with any operations-related vehicle trips made to and from the project site and from related equipment.

5.8.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project would:

GHG-1 Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

GHG-2 Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

South Coast Air Quality Management District

The South Coast AQMD has adopted a significance threshold of 10,000 $MTCO_2e$ per year for permitted (stationary) sources of GHG emissions for which it is the designated lead agency. To provide guidance to local lead agencies on determining the significance of GHG emissions in CEQA documents, South Coast AQMD convened a GHG CEQA Significance Threshold Working Group (Working Group). Based on the last Working Group meeting (Meeting No. 15) in September 2010, South Coast AQMD identified a tiered approach for evaluating GHG emissions for development projects where South Coast AQMD is not the lead agency (South Coast AQMD 2010a). The tiered approach has not been formally adopted by South Coast AQMD.

- **Tier 1.** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.
- **Tier 2.** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (e.g., city or county), project-level and cumulative GHG emissions are less than significant.
- **Tier 3.** If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant.
- For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, South Coast AQMD requires an assessment of GHG emissions. Project-related GHG emissions include on-road transportation, energy use, water use, wastewater generation, solid waste disposal, area sources, off-road emissions, and construction activities. The South Coast AQMD Working Group identified that because construction activities would result in a "one-time" net increase in GHG emissions, construction activities should be amortized into the operational phase GHG emissions inventory based on the service

life of a building. For buildings in general, it is reasonable to look at a 30-year time frame, since this is a typical interval before a new building requires the first major renovation. The South Coast AQMD identified a screening-level threshold of 3,000 $MTCO_2e$ annually for all land use types. This bright-line screening-level threshold is based on a review of the database of CEQA projects from the Governor's Office of Planning and Research. Based on review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line threshold. Therefore, projects that do not exceed the bright-line threshold would have a nominal, less than cumulatively considerable impact on GHG emissions. Though three thresholds were identified, South Coast AQMD recommends use of 3,000 $MTCO_2e$ per year ($MTCO_2e$/yr) for all project types (South Coast AQMD 2010b).

- **Tier 4.** If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted. South Coast AQMD identified an efficiency target for projects that exceed the bright-line threshold: a 2020 efficiency target of 4.8 $MTCO_2e$ per year per service population ($MTCO_2e$/year/SP) for project-level analyses and 6.6 $MTCO_2e$/year/SP for plan-level projects (e.g., general plans). Service population is generally defined as the sum of residential and employment population of a project. The per capita efficiency targets are based on the AB 32 GHG reduction target and 2020 GHG emissions inventory prepared for CARB's 2008 Scoping Plan.[5]

For purposes of this analysis, the bright-line threshold of 3,000 $MTCO_2e$/yr is used to determine the project's impacts.

Mojave Desert Air Quality Management District

The anticipated site remediation may include the transport of impacted soils to an offsite location outside of the South Coast AQMD jurisdictional area. For purposes of this analysis, it is assumed that any impacted soil removed offsite would be transported to a receiving location in Adelanto. The primary route would take a haul truck through the SoCAB and the Mojave Desert Air Basin (MDAB), which is managed by the Mojave Desert Air Quality Management District (MDAQMD). The MDAQMD has adopted thresholds for GHG emissions generated in the MDAB. Emissions from transport of impacted soil from remediation activities is also compared the MDAQMD CEQA thresholds (MDAQMD 2016) shown in Table 5.8-5, *MDAQMD Greenhouse Gas Significance Thresholds*.

Table 5.8-5 MDAQMD Greenhouse Gas Significance Thresholds

Annual (tons/year)	Daily[1] (lbs/day)
100,000	548,000

Source: MDAQMD 2016.
[1] Project with phases shorter than one year, including construction activities, can be compared to the daily value.

[5] South Coast AQMD took the 2020 statewide GHG reduction target for "land use only" GHG emissions sectors and divided it by the 2020 statewide employment for the land use sectors to derive a per capita GHG efficiency metric that coincides with the GHG reduction targets of AB 32 for year 2020.

5.8.3 Plans, Programs, and Policies

PPP GHG-1 New buildings are required to achieve the current California Building Energy Efficiency Standards (Title 24, Part 6) and California Green Building Standards Code (CALGreen) (Title 24, Part 11). The 2019 Building Energy Efficiency Standards were effective on January 1, 2020, and the 2022 Building Energy Efficiency Standards will become effective January 1, 2023.

PPP GHG-2 New buildings are required to adhere to the California Green Building Standards Code (CALGreen) requirement to provide bicycle parking for new nonresidential buildings, or meet local bicycle parking ordinances, whichever is stricter (CALGreen secs. 5.106.4.1, 14.106.4.1, and 5.106.4.1.2).

PPP GHG-3 California's Green Building Standards Code (CALGreen) requires the recycling and/or salvaging for reuse at minimum of 65 percent of the nonhazardous construction and demolition waste generated during most "new construction" projects (CALGreen secs. 4.408 and 5.408). Construction contractors are required to submit a construction waste management plan that identifies the construction and demolition waste materials to be diverted from disposal by recycling, reused on the project, or salvaged for future use or sale and the amount (by weight or volume).

PPP GHG-4 Construction activities are required to adhere to Title 13 California Code of Regulations Section 2499, which requires that nonessential idling of construction equipment is restricted to five minutes or less.

PPP GHG-5 New buildings are required to adhere to the California Green Building Standards Code and Water Efficient Landscape Ordinance requirements to increase water efficiency and reduce urban per capita water demand.

PPP GHG-6 CARB's Renewable Portfolio Standard (RPS) is a foundational element of the State's emissions reduction plan. These mandates apply directly to investor-owned utilities, which in the case of the proposed project is Southern California Edison. On September 10, 2018, Senate Bill 100 was signed into law and established the following RPS targets: 50 percent renewable resources target by December 31, 2026, and 60 percent target by December 31, 2030. SB 100 also requires that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt-hours of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024; 52 percent by December 31, 2027; and 60 percent by December 31, 2030.

PPP GHG-7 On January 18, 2007, Governor Arnold Schwarzenegger issued Executive Order S-1-07 requiring the establishment of a Low Carbon Fuel Standard (LCFS) for transportation fuels. The LCFS was amended in 2011 and readopted in 2015. This statewide goal required that California's transportation fuels reduce their carbon intensity by at least 10 percent by 2020.

PPP GHG-8 The 2007 Energy Bill creates new federal requirements for increases in fleetwide fuel economy for passenger vehicles and light trucks under the Federal Corporate Average Fuel Economy Standards. The federal legislation requires a fleetwide average of 35 miles per gallon to be achieved by 2020. The National Highway Traffic Safety Administration is directed to phase in requirements to achieve this goal. Analysis by CARB suggests that this will require an annual improvement of approximately 3.4 percent between 2008 and 2020.

PPP GHG-9 On July 22, 2002, Governor Gray Davis signed Assembly Bill 1493 (Pavley) requiring CARB to develop and adopt regulations designed to reduce greenhouse gases emitted by passenger vehicles and light-duty trucks beginning with the 2009 model year. The standards set within the Pavley regulations are expected to reduce GHG emissions from California passenger vehicles by about 22 percent in 2012 and about 30 percent in 2016. California petitioned the EPA in December 2005 to allow these more stringent standards, and California executive agencies have repeated their commitment to higher mileage standards. On July 1, 2009, the EPA granted California a waiver that enabled the state to enforce stricter tailpipe emissions on new motor vehicles.

PPP GHG-10 SB 375 requires the reduction of GHG emissions from light trucks and automobiles through land use and transportation efforts that will reduce vehicle miles traveled. In essence, SB 375's goal is to control GHGs by curbing urban sprawl and through better land use planning. SB 375 essentially becomes the land use contribution to the GHG reduction requirements of AB 32, California's global warming bill enacted in 2006, and SB 32.

5.8.4 Environmental Impacts

5.8.4.1 METHODOLOGY

This GHG evaluation was prepared in accordance with the requirements of CEQA to determine if significant GHG impacts are likely in conjunction with the proposed project. South Coast AQMD has published guidelines that are intended to provide local governments with guidance for analyzing and mitigating environmental impacts, and they were used in this analysis. The analysis in this section is based on buildout of the proposed project as modeled using CalEEMod, version 2020.4.0, for the following sectors:

- **Transportation.** Based on daily trip generation and VMT data from LLG (see Appendix N). The proposed project would generate 9,351 weekday average daily trips (ADT), 12,389 Saturday ADTs, and 10,333 Sunday ADTs at full buildout. Additionally, an average trip distance of 8.95 miles per vehicle is used, based on the calculated 83,659 VMT per weekday for year 2035.

- **Area Sources.** Area sources generated from use of consumer products and cleaning supplies are based on CalEEMod default emission rates and on the assumed building and land use square footages. For fireplaces, it is assumed that single-family detached and attached homes ((i.e. townhomes) are equipped with gas fireplaces per South Coast AQMD Rule 445.

- **Energy.** The CalEEMod default energy rates, which are based on the 2019 Building Energy Efficiency Standards, are used to quantify GHG emissions from energy use (i.e., natural gas and electricity). Use of the CalEEMod default energy rates results in conservative estimates compared to the recently adopted 2022 Building Energy Efficiency Standards because it is anticipated new buildings under the 2022 Standards would result in higher electricity use and lower natural gas use compared to 2019 standards. Furthermore, the carbon intensity factor is based on the CO_2e intensity factor of 512 pounds per megawatt hour (lbs/MWh) as reported in Southern California Edison's 2020 Sustainability Report (SCE 2020). Additionally, because buildout is anticipated for year 2035, the CO_2e intensity factor of 512 lbs/MWh is adjusted to account for the year 2027 RPS goal of 52 percent, which results in a CO_2e intensity factor of 373 lbs/MWh. Overall, using the AR4 GWPs and the default CalEEMod intensity factors of 0.033 lb/MWh for CH_4 and 0.004 lb/MWh for N_2O, the adjusted intensity factor for CO_2 is 371.48 lbs/MWh.

- **Solid Waste Disposal.** Indirect emissions from waste generation are based on a total daily solid waste generation of 16,130 pounds per day (see Impact 5.19-4 for further details).

- **Water/Wastewater.** GHG emissions from this sector are associated with the embodied energy used to supply, treat, and distribute water and treat wastewater, and with fugitive GHG emissions from wastewater treatment. Emissions are based on average water demand and wastewater generation provided by Psomas (see Appendices Q and R).

- **Construction.** For purposes of this analysis, development of the proposed project is anticipated to begin in year 2023 and continue over three development phases in addition to the required remediation (see Table 5.3-10, *Construction Activities, Phasing, and Equipment*). Emissions of GHG would primarily be from operation of off-road construction equipment in addition to construction worker, vendor, and haul vehicles.

Life cycle emissions are not included in this analysis because not enough information is available for the proposed project, and therefore life cycle GHG emissions would be speculative.[6] Black carbon emissions are not included in the GHG analysis because CARB does not include this pollutant in the state's AB 32 inventory but treats this short-lived climate pollutant separately.[7] Additionally, while not anticipated, industrial sources of emissions that require a permit from South Coast AQMD (permitted sources) are not included in

[6] Life cycle emissions include indirect emissions associated with materials manufacture. However, these indirect emissions involve numerous parties, each of which is responsible for GHG emissions of their particular activity. The California Resources Agency, in adopting the CEQA Guidelines Amendments on GHG emissions found that lifecycle analyses was not warranted for project-specific CEQA analysis in most situations, for a variety of reasons, including lack of control over some sources, and the possibility of double-counting emissions (see Final Statement of Reasons for Regulatory Action, December 2009). Because the amount of materials consumed during the operation or construction of the proposed project is not known, the origin of the raw materials purchased is not known, and manufacturing information for those raw materials are also not known, calculation of life cycle emissions would be speculative. A life-cycle analysis is not warranted (OPR 2008).

[7] Particulate matter emissions, which include black carbon, are analyzed in Section 5.3, *Air Quality*. Black carbon emissions have sharply declined due to efforts to reduce on-road and off-road vehicle emissions, especially diesel particulate matter. The State's existing air quality policies will virtually eliminate black carbon emissions from on-road diesel engines within 10 years (CARB 2017a).

the proposed project community inventory since they have separate emission reduction requirements. GHG modeling is included in Appendix C of this DEIR.

5.8.4.2 IMPACT ANALYSIS

The following impact analysis addresses the thresholds of significance; the applicable thresholds are identified in brackets after the impact statement.

Impact 5.8-1: Buildout of the proposed project would generate a substantial increase in GHG emissions compared to existing conditions and would have a significant impact on the environment. [Threshold GHG-1])

Implementation of a development project could contribute to global climate change through direct emissions of GHGs from onsite area sources and vehicle trips generated by the project, and indirectly through offsite energy production required for onsite activities, water use, and waste disposal. Because no single project is large enough to result in a measurable increase in global concentrations of GHG emissions, climate change impacts of a project are considered on a cumulative basis.

Emissions in the SoCAB

The proposed Specific Plan includes sustainable community design guidelines that focus on areas such as land use and transportation planning, energy efficiency, material efficiency, and water efficiency. The land use and transportation design guidelines include providing access to public and common use space within 0.25- to 0.50-mile walking distance from residential neighborhoods in the Specific Plan; including bicycle storage facilities in multifamily residential and community uses; and integrating bicycle paths/trails into the circulation network. Under the energy efficiency guidelines, a focal point is to utilize passive building design to minimize energy demand associated with heating and cooling. The water efficiency guidelines include using ultra low-flush toilets and low-flow fixtures, installing synthetic turf at the proposed Sports Park, and using drought-tolerant plants.

Annual GHG emissions were calculated for construction and operation of the proposed project and are shown in Table 5.8-6, *Project GHG Emissions Inventory*. The project operational phase emissions are from operation of the proposed land uses, off-road equipment used for daily operations, and project-related vehicle trips. Construction emissions were amortized into the operational phase in accordance with South Coast AQMD's proposed methodology (South Coast AQMD 2009).

Table 5.8-6 Project GHG Emissions Inventory

Source	GHG Emissions	
	$MTCO_2e$ per Year	Percentage
Area	285	2%
Energy[1]	2,285	18%
Mobile[2]	8,228	64%
Solid Waste	1,480	11%
Water	340	3%
Construction-Amortized[3]	275	2%
Total All Sectors	**12,894**	**100%**
Proposed South Coast AQMD Bright-Line Threshold	3,000 $MTCO_2e$	NA
Exceeds Threshold?	**Yes**	**NA**

Source: CalEEMod, Version 2020.4.0.
Notes: Manual summation of values may not equal the shown totals due to rounding.
[1] Utilizes an adjusted CO_2 intensity factor of 371.48 lbs/MWh based on the CO_2e intensity factor of 512 lbs/MWh reported by SCE for year 2020 and normalized to the RPS requirement for year 2027 of 52 percent (SCE 2020).
[2] Based on CalEEMod default calendar year 2035 vehicle emissions data.
[3] Construction emissions are amortized over a 30-year project lifetime per recommended South Coast AQMD methodology.

The Specific Plan has sustainable design guidelines that contribute to reducing GHG emissions, but because of its scale, the proposed project would generate annual GHG emissions of 12,894 $MTCO_2e$/yr and would exceed the bright-line threshold of 3,000 $MTCO_2e$/yr by 9,894 $MTCO_2e$/yr. The primary sources of project-related emissions would be from mobile-source emissions generated by the project-related vehicle trips, followed by energy sector emissions and solid waste sector emissions. Therefore, GHG emissions generated by the proposed project would cumulatively contribute to statewide GHG emissions, and impacts are potentially significant.

Emissions in the MDAB

For purposes of modeling, approximately 21.9 miles of the 75-mile soil haul route would be in the MDAB. Table 5.8-7, *Construction-Related GHG Emissions in the MDAB*, shows that GHG emissions from construction-related activities would be less than the MDAQMD daily and annual significance thresholds. Therefore, GHG impacts from project-related construction activities in the MDAB would be less than significant.

Table 5.8-7 Construction-Related GHG Emissions in the MDAB

Source	Lbs/Day[1]	Tons/Year
Year 2023 (Western Remediation Area)	11,554	81
Year 2024 (Eastern Remediation Area)	10,981	187
MDAQMD's Threshold	548,000	100,000
Exceeds Threshold?	No	No

Source: CalEEMod, version 2020.4.0.
[1] Emissions shown represent the proportion of the total emissions generated from impacted soil haul truck trips that would occur within the MDAB.

Level of Significance Before Mitigation: Potentially significant.

Impact 5.8-2: Implementation of the proposed project would not conflict with plans adopted for the purpose of reducing GHG emissions. [Threshold GHG-2])

Impact Analysis: Applicable plans adopted for the purpose of reducing GHG emissions include CARB's Scoping Plan, SCAG's *Connect SoCal*, and the City's Sustainability Plan. A consistency analysis with these plans is presented below:

CARB Scoping Plan

The CARB Scoping Plan is applicable to state agencies, but is not directly applicable to cities/counties and individual projects (i.e., the Scoping Plan does not require the City to adopt policies, programs, or regulations to reduce GHG emissions). However, new regulations adopted by the state agencies in the Scoping Plan result in GHG emissions reductions at the local level. As a result, local jurisdictions benefit from reductions in transportation emissions rates, increases in water efficiency in the building and landscape codes, and other statewide actions that affect a local jurisdiction's emissions inventory from the top down. Statewide strategies to reduce GHG emissions include the LCFS and changes in the corporate average fuel economy standards (e.g., Pavley I and Pavley California Advanced Clean Cars program).

Development projects accommodated under the proposed project are required to adhere to the programs and regulations identified by the Scoping Plan and implemented by state, regional, and local agencies to achieve the statewide GHG reduction goals of AB 32. These future individual development projects would comply with these statewide GHG emissions reduction measures. For example, new buildings under the proposed project would meet the current CALGreen and Building Energy Efficiency Standards. Project GHG emissions shown in Table 5.8-6 include reductions associated with statewide strategies that have been adopted since AB 32. Therefore, the proposed project would not obstruct implementation of the CARB Scoping Plan, and impacts are considered less than significant.

SCAG's Regional Transportation Plan/Sustainable Communities Strategy

Connect SoCal finds that land use strategies that focus on new housing and job growth in areas rich with destinations and mobility options would be consistent with a land use development pattern that supports and complements the proposed transportation network. The overarching strategy in *Connect SoCal* is to plan for the southern California region to grow in more compact communities in transit priority areas and priority growth areas; provide neighborhoods with efficient and plentiful public transit; establish abundant and safe opportunities to walk, bike, and pursue other forms of active transportation; and preserve more of the region's remaining natural lands and farmlands (SCAG 2020). *Connect SoCal*'s transportation projects help more efficiently distribute population, housing, and employment growth, and forecast development is generally consistent with regional-level general plan data to promote active transportation and reduce GHG emissions. The projected regional development, when integrated with the proposed regional transportation network in *Connect SoCal*, would reduce per-capita GHG emissions related to vehicular travel and achieve the GHG reduction per capita targets for the SCAG region.

The proposed project would provide up to 1,100 additional housing units that would serve the local population. As discussed in Impact 5.14-1 of this DEIR, the city is currently jobs-rich, at 2.98 jobs per

housing unit. Implementation of the proposed project, which would provide additional housing, would decrease the jobs-housing ratio to 2.80. Because the recommended jobs-housing ratio is between 1.3 and 1.7, implementation of the proposed project would improve the jobs-housing balance for the City overall and could contribute to reducing the average distance traveled between where people live and work, therefore reducing passenger VMT. Additionally, as discussed under Impact 5.17-2, the project-generated VMT per service population would be lower than the City of Brea General Plan Buildout VMT per population threshold; overall, the proposed project would result in less than significant VMT impacts. Therefore, the proposed project would not interfere with SCAG's ability to implement the regional strategies in the RTP/SCS, and impacts are considered less than significant.

City of Brea Sustainability Plan

The Sustainability Plan goals and measures focus on reducing GHG emissions through increasing building energy efficiency, increasing use of renewable energy, waste diversion, water conservation, and reducing VMT. The Sustainability Plan has 88 measures divided over three implementation phases to achieve the emissions reduction target under the plan. Implementation of the Sustainability Plan would achieve emissions reductions of 35,144 $MTCO_2e$, which would exceed the reduction target of 34,772 $MTCO_2e$ by year 2020.

As discussed in Impact 5.8-1, the proposed Specific Plan has sustainable community design guidelines that focus on land use and transportation planning, energy efficiency, material efficiency, and water conservation and efficiency. Consistent with the Sustainability Plan's focus on improving active transit, the proposed Specific Plan land use and transportation design guidelines include providing access to public and common use space within a 0.25- to 0.50-mile walking distance from residential neighborhoods in the project site. The proposed guidelines also include incorporation of bicycle storage facilities in multifamily residential and community uses and integrating bicycle paths/trails into the circulation network.

Furthermore, a focal point of the energy efficiency guidelines of the proposed Specific Plan is to use passive building design to minimize energy demand associated with heating and cooling. At a minimum, the residential units accommodated under the proposed project would be built to comply with the 2019 Building Energy Efficiency Standards and CALGreen standards. Compliance with these two standards would increase the energy efficiency of the proposed residential uses. Under the 2019 Building Energy Efficiency Standards, single-family homes and multifamily buildings of three stories or less would be required to install solar photovoltaic (PV) systems. Moreover, the water efficiency guidelines include using ultra low-flush toilets and low-flow fixtures, synthetic turf at the proposed sports park, state-of-the art irrigation controllers, self-closing nozzles on hoses, and drought-tolerant plants. Furthermore, starting on January 1, 2023, homes would be subject to the 2022 Building Energy Efficiency Standards, which would require single-family homes and multifamily buildings of three stories or less to be designed and built "electric ready"—that is, accommodate replacing natural gas-powered appliances (e.g., stove) and systems to their electric counterparts. Thus, overall, the proposed project would generally be consistent with the goals of the City's Sustainability Plan. Therefore, implementation of the proposed project would not be inconsistent or interfere with implementation of the City's Sustainability Plan, and impacts are considered less than significant.

Level of Significance Before Mitigation: Less than significant.

5.8.5 Cumulative Impacts

Project-related GHG emissions are not confined to a particular air basin, but are dispersed worldwide. Therefore, impacts under Impact 5.8-1 are not project-specific impacts to global warming, but the proposed project's contribution to this cumulative impact.

5.8.6 Level of Significance Before Mitigation

Upon implementation of the plans, programs, and policies, the following impact would be less than significant: 5.8-2.

Without mitigation, these impacts would be **potentially significant**:

- **Impact 5.8-1** Buildout of the proposed project would generate a substantial increase in GHG emissions compared to existing conditions and would have a significant impact on the environment.

5.8.7 Mitigation Measures

Impact 5.8-1

GHG-1 The project developer(s) shall design and build all residential homes to meet/include the following:

a) Tier 2 requirements for Division A4.1, Planning and Design, as outlined under Section A4.203.1.2.2 of Appendix A4 Residential Voluntary Measures of the 2019 California Green Building Standards Code.

b) Tier 2 requirements for Division A4.2, Energy Efficiency, as outlined under Section A4.203.1.2.2 of Appendix A4 Residential Voluntary Measures of the 2019 California Green Building Standards Code.

c) Tier 2 requirements for Division A4.3, Water Efficiency and Conservation, as outlined under Section A4.601.5.2 of Appendix A4 Residential Voluntary Measures of the 2019 California Green Building Standards Code; comply with at least three elective measures selected from Division A4.3 of Appendix A4 Residential Voluntary Measures of the 2019 California Green Building Standards Code.

d) No wood-burning or gas-powered fireplaces shall be installed in any of the dwelling units.

e) Install a home battery storage unit (e.g., Tesla Powerwall) for all single-family units that are fitted with a solar photovoltaic generation system. At minimum, all installed battery storage units shall meet the requirements in Reference Joint Appendix 12 of the 2022 Building Energy Efficiency Standards.

f) Install a battery storage unit(s) (e.g., Tesla Powerwall) for all multifamily residential buildings that are fitted with a solar photovoltaic generation system. At minimum, all installed battery storage units shall meet the requirements in Reference Joint Appendix 12 of the 2022 Building Energy Efficiency Standards.

g) All buildings will be all electric, meaning that electricity is the only permanent source of energy for water heating; mechanical; heating, ventilation, and air conditioning (HVAC) (i.e., space-heating and space cooling); cooking; and clothes-drying, and there is no gas-meter connection. All major appliances (e.g., dishwashers, refrigerators, clothes washers and dryers, and water heaters) provided/installed shall be electric-powered EnergyStar-certified or of equivalent energy efficiency, where applicable.

Prior to the issuance of building permits for new development projects within the project site, the project developer(s) shall show provide documentation (e.g., building plans) to the City of Brea Building Division official or his/her designee, to verify implementation of the of the design requirements listed above in this mitigation measure. Prior to the issuance of the certificate of occupancy, the City of Brea shall verify implementation of the design requirements specified above.

GHG-2 The project developer shall design public-use parking lots that:

a) Provide electric vehicle (EV) charging stations. At minimum, the number of EV charging stations shall equal the Tier 2 Nonresidential Voluntary Measures of the California Green Building Standards Code, Section A5.106.5.3.2.

b) Provide parking for low-emitting, fuel-efficient, and carpool/van vehicles. At minimum, the number of preferential parking spaces shall equal the Tier 2 Nonresidential Voluntary Measures of the California Green Building Standards Code, Section A5.106.5.1.2

Prior to the issuance of building permits for new development projects within the project site, the project developer(s) shall provide documentation (e.g., site plans) to the City of Brea Building Division official or his/her designee, to verify implementation of the of the design requirements specified above in this mitigation measure. Prior to the issuance of the certificate of occupancy, the City of Brea shall verify implementation of the design requirements specified above.

5.8.8 Level of Significance After Mitigation

Impact 5.8-1

Implementation of Mitigation Measures GHG-1 and GHG-2 would contribute to minimizing emissions. Table 5.8-8, *Project GHG Emissions Inventory with Mitigation*, shows emissions reductions associated with measures *d* and *g* of Mitigation Measure GHG-1. Because there are no specific project-level building designs for the proposed future residences, the potential emissions reductions associated with measures *a* through *c*

of Mitigation Measure GHG-1 are not quantified and cannot be accounted for in the mitigated inventory shown in the table. Additionally, potential emissions reductions associated with Mitigation Measure GHG-2 are not quantified and not accounted for in Table 5.8-8 because use of EV chargers and the preferred vehicle parking spaces would be voluntary, and their frequency of use would be speculative. Measures *e* and *f* are also not quantified.

Table 5.8-8 Project GHG Emissions Inventory with Mitigation

Source	GHG Emissions ($MTCO_2e$ Per Year)		
	Unmitigated Inventory	Mitigated Inventory	Net Change
Area	285	19	-266
Energy[1]	2,285	1,809[2]	-477
Mobile[3]	8,228	8,228	0
Solid Waste	1,480	1,480	0
Water	340	340	0
Construction-Amortized[3]	275	275	0
Total All Sectors	**12,894**	**12,152**	**-742**
Proposed South Coast AQMD Bright-Line Threshold	3,000 $MTCO_2e$	3,000 $MTCO_2e$	N/A
Exceeds Threshold?	**Yes**	**Yes**	**N/A**
Amount Exceeding the Bright-Line Threshold	9,979	7,904	N/A

Source: CalEEMod, Version 2020.4.0.
Notes: Manual summation of the values may not equal the shown totals due to rounding.
1 Utilizes an adjusted CO_2 intensity factor of 371.48 lbs/MWh based on the CO_2e intensity factor of 512 lbs/MWh reported by SCE for year 2020 and normalized to the RPS requirement for year 2027 of 52 percent (SCE 2020).
2 The change in energy consumption associated with an all-electric home compared to a mixed-fuel (i.e., natural gas and electricity) is based on applying an adjustment factor to the CalEEMod default energy rates using data from Table A-9 of the Sacramento Metropolitan Air Quality Management District Greenhouse Gas Thresholds for Sacramento County (SMAQMD 2020).
3 Based on CalEEMod default calendar year 2035 vehicle emissions data.
4 Construction emissions are amortized over a 30-year project lifetime per recommended South Coast AQMD methodology (South Coast AQMD 2009).

As shown in the table, implementation of measures *d* and *f* of Mitigation Measure GHG-1 would provide a net reduction in emissions of 742 $MTCO_2e$/yr and reduce overall project emissions to 12,152 $MTCO_2e$/yr. Implementation of the other measures under Mitigation Measure GHG-1 would also contribute to reducing GHG emissions. For example, installation of battery storage for the proposed homes would further enable homes to rely on more renewable electricity to meet their energy needs and rely less on grid electricity. An all-electric home paired with both a PV and battery storage system could reduce GHG emissions by 76 to 77 percent compared to standard mixed-fuel homes designed and built to the 2019 Building Energy Efficiency Standards (Frontier 2019).[8] However, even with the additional reductions associated with Mitigation Measure GHG-1 and Mitigation Measure GHG-2, it is anticipated that the proposed project would still exceed the bright-line threshold of 3,000 $MTCO_2e$/yr. Therefore, Impact GHG-1 would be significant and unavoidable.

8 Based on single-family and low-rise multifamily homes (one to three stories) built in Climate Zone 8 of California.

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5. Environmental Analysis
GREENHOUSE GAS EMISSIONS

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