5.6 GREENHOUSE GAS EMISSIONS

This section of the DEIR evaluates the potential for implementation of the Sierra Madre General Plan Update (General Plan Update) 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 emissions, 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 (SCAQMD). Transportation-sector impacts are based on trip generation data provided in the Traffic Impact Study prepared by Fehr and Peers (see Appendix E) for trips generated in the City of Sierra Madre. GHG emissions modeling for the project is included in Appendix B of this DEIR.

5.6.1 Environmental Setting

5.6.1.1 GREENHOUSE GASES AND CLIMATE CHANGE

Climate change is the variation of earth's climate over time, whether due to natural variability or as a result of human activities. Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. The primary source of these GHG is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHG—water vapor,[1] carbon dioxide (CO_2), methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed within the 20th and 21st centuries. Other GHG 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).[2] The major GHGs are briefly described below.

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 municipal landfills and water treatment facilities.

[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 2014a). However, state and national GHG inventories do not include black carbon yet due to ongoing work resolving the precise global warming potential of black carbon. Guidance for CEQA documents does not yet include black carbon.

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

Fluorinated gases are synthetic, strong GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high global warming potential (GWP) gases.

- ***Chlorofluorocarbons (CFCs)*** are GHGs covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (troposphere, stratosphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down the ozone layer. These gases are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.

- ***Perfluorocarbons (PFCs)*** are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF_4] and perfluoroethane [C_2F_6]) were introduced as alternatives, along with HFCs, to the ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are also used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high global warming potential (GWP).

- ***Sulfur Hexafluoride (SF_6)*** is a colorless gas soluble in alcohol and ether, and slightly soluble in water. SF_6 is a strong GHG used primarily in electrical transmission and distribution systems as an insulator.

- ***Hydrochlorofluorocarbons (HCFCs)*** contain hydrogen, fluorine, chlorine, and carbon atoms. Although they are ozone-depleting substances, they are less potent than CFCs. They have been introduced as temporary replacements for CFCs.

- ***Hydrofluorocarbons (HFCs)*** contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances to serve many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong GHGs (USEPA 2012, IPCC 2001).

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 5.6-1. 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.[3] For example, under IPCC's Second Assessment Report GWP values for CH_4, a project that generates 10 metric tons (MT) of CH_4 would be equivalent to 210 MT of CO_2 (210 $MTCO_2e$).

[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 5.6-1 GHG Emissions and their Relative Global Warming Potential Compared to CO_2

GHGs	Atmospheric Lifetime (Years)	Second Assessment Report Global Warming Potential Relative to CO_2[1]	Fourth Assessment Report Global Warming Potential Relative to CO_2[1]
Carbon Dioxide (CO_2)	50 to 200	1	1
Methane[2] (CH_4)	12 (±3)	21	25
Nitrous Oxide (N_2O)	120	310	298
Hydrofluorocarbons:			
HFC-23	264	11,700	14,800
HFC-32	5.6	650	675
HFC-125	32.6	2,800	3,500
HFC-134a	14.6	1,300	1,430
HFC-143a	48.3	3,800	4,470
HFC-152a	1.5	140	124
HFC-227ea	36.5	2,900	3,220
HFC-236fa	209	6,300	9,810
HFC-4310mee	17.1	1,300	1,030
Perfluoromethane: CF_4	50,000	6,500	7,390
Perfluoroethane: C_2F_6	10,000	9,200	12,200
Perfluorobutane: C_4F_{10}	2,600	7,000	8,860
Perfluoro-2-methylpentane: C_6F_{14}	3,200	7,400	9,300
Sulfur Hexafluoride (SF_6)	3,200	23,900	22,800

Source: IPCC 2001 and IPCC 2007

Note: In its Fifth Assessment Report (2013), the IPCC has published updated global warming potential (GWP) values that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO_2 (radiative forcing is the difference of energy from sunlight received by the earth and radiated back into space). However, GWP values identified in the Second Assessment Report are still used by SCAQMD to maintain consistency in GHG emissions modeling. In addition, the 2008 Scoping Plan was based on the GWP values in the Second Assessment Report.

1 Based on 100-year time horizon of the GWP of the air pollutant relative to CO_2 (IPCC 2001 and IPCC 2007).

2 The methane GWP includes direct 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.

California's GHG Sources and Relative Contribution

California is the tenth largest GHG emitter in the world and the second largest emitter of GHG emissions in the United States, only surpassed by Texas. However, California also has over 12 million more people than the state of Texas. Because of more stringent air emission regulations, in 2001 California ranked fourth lowest in carbon emissions per capita and fifth lowest among states in CO_2 emissions from fossil fuel consumption per unit of Gross State Product (total economic output of goods and services) (CEC 2006a).

The California Air Resources Board's (CARB) last update to the statewide GHG emissions inventory that used the Second Assessment Report GWPs was in 2012 for year 2009 emissions.[4] In 2009, California produced 457 million metric tons (MMT) of CO_2e GHG emissions. California's transportation sector is the single largest generator of GHG emissions, producing 37.9 percent of the state's total emissions. Electricity

4 Methodology for determining the statewide GHG inventory is not the same as the methodology used to determine statewide GHG emissions under Assembly Bill 32 (AB 32).

consumption is the second largest source, producing 22.7 percent. Industrial activities are California's third largest source of GHG emissions, at 17.8 percent (CARB 2012a).

In 2013, the statewide GHG emissions inventory was updated for 2000 to 2012 emissions using the GWPs in IPCC's Fourth Assessment Report. Based on these GWPs, California produced 459 $MMTCO_2e$ GHG emissions in 2012. California's transportation sector remains the single largest generator of GHG emissions, producing 36.5 percent of the state's total emissions. Electricity consumption made up 20.7 percent, and industrial activities produced 19.4 percent. Other major sectors of GHG emissions include commercial and residential, recycling and waste, high GWP GHGs, agriculture, and forestry (CARB 2014b).

Human Influence on Climate Change

For approximately 1,000 years before the Industrial Revolution, the amount of GHG 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 Earth's atmosphere has increased by more than 35 percent since preindustrial times and has increased at an average rate of 1.4 parts per million (ppm) 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).

Projections of climate change depend heavily upon future human activity. Therefore, climate models are based on different emission scenarios that account for historic 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;
- Areas affected by drought increases;
- Intense tropical cyclone activity increases;
- Increased incidence of extreme high sea level (excluding tsunamis).

IPCC's "2007 IPCC Fourth Assessment Report" projects that the global mean temperature increase from 1990 to 2100, under different climate-change scenarios, will range from 1.4 to 5.8°C (2.5 to 10.4°F). 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).

Potential Climate Change Impacts for California

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. 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) a 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). According to the California Climate Action Team (CAT)— 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 actions could be taken to immediately curtail climate change emissions, the potency of emissions that have already built up, their long atmospheric lifetimes (see Table 5.6-1), 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 now considered unavoidable. Global climate change risks to California are shown in Table 5.6-2 and include public health impacts, water resources impacts, agriculture impacts, sea level impacts, forest and biological resources impacts, and energy impacts. Specific climate change impacts that could affect the project include health impacts from a reduction in air quality, water resources impacts from a reduction in water supply, and increased energy demand.

Table 5.6-2 Summary of Global Climate Change Risks to California

Impact Category	Potential Risk
Public Health Impacts	• Poor air quality made worse • More severe heat
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 • Increasing threats from pest and pathogens • Declining forest productivity • 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 2006b; CEC 2008.

5.6.1.2 REGULATORY SETTING

Regulation of GHG Emissions on a National Level

The United States 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 U.S. Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings did not in and of 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).

The EPA's endangerment finding covers 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 SCAQMD's 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 metric tons (MT) or more of (CO_2e) or more per year are required to submit an annual report.

Update to Corporate Average Fuel Economy Standards (2010/2012)

The current Corporate Average Fuel Economy (CAFE) standards (for model years 2011 to 2016) incorporate stricter fuel-economy requirements promulgated by the federal government and California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016 (resulting in a fleet average of 35.5 miles per gallon [mpg] by 2016). Rulemaking to adopt these new standards was completed in 2010. California agreed to allow automakers who show compliance with the national program to also be deemed in compliance with state requirements. The federal government issued new standards in 2012 for model years 2017–2025, which will require a fleet average of 54.5 mpg in 2025.

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 stationary sources such as power plants, refineries, and other large sources of emissions. Pursuant to the President's 2013 Climate Action Plan, the EPA will be directed to also develop regulations for existing stationary sources.

Regulation of GHG Emissions on a State Level

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

Executive Order S-03-05

Executive Order 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

Executive Order B-30-15

Executive Order B-30-15, signed April 29, 2015, sets a goal of reducing GHG emissions within the state to 40 percent of 1990 levels by year 2030. Executive Order B-30-15 also directs CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the State and requires state agencies to implement measures to meet the interim 2030 goal of Executive Order B-30-15 as well as the long-term goal for 2050 in Executive Order S-03-5. Executive Order B-30-15 also requires the Natural Resources Agency to conduct triennial updates the California adaption strategy, Safeguarding California, in order to ensure climate change is accounted for in State planning and investment decisions.

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 AB 32, 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 Executive Order S-03-05.

CARB 2008 Scoping Plan

The final Scoping Plan was adopted by CARB on December 11, 2008. AB 32 directed CARB to adopt discrete early-action measures to reduce GHG emissions and outline additional reduction measures to meet the 2020 target. 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 can be met, and develop appropriate regulations and programs to implement the plan by 2012.

The 2008 Scoping Plan identified that GHG emissions in California are anticipated to be approximately 596 $MMTCO_2e$ by 2020. In December 2007, CARB approved a 2020 emissions limit of 427 $MMTCO_2e$ (471 million tons) for the state. The 2020 target requires a total emissions reduction of 169 $MMTCO_2e$, 28.5 percent from the projected emissions of the business-as-usual (BAU) scenario for the year 2020 (i.e., 28.5 percent of 596 $MMTCO_2e$) (CARB 2008).[5]

Since release of the 2008 Scoping Plan, CARB has updated the statewide GHG emissions inventory to reflect GHG emissions in light of the economic downturn and of measures not previously considered in the 2008 Scoping Plan baseline inventory. The updated forecast predicts emissions to be 545 $MMTCO_2e$ by 2020. The revised BAU 2020 forecast shows that the state would have to reduce GHG emissions by 21.7 percent from BAU. The new inventory also identifies that if the updated 2020 forecast includes the reductions assumed from implementation of Pavley (26 $MMTCO_2e$ of reductions) and the 33 percent renewable portfolio standard (RPS) (12 $MMTCO_2e$ of reductions) the forecast would be 507 $MMTCO_2e$ in 2020, and an estimated 80 $MMTCO_2e$ of additional reductions are necessary to achieve the statewide emissions reduction of AB 32 by 2020, or a 15.7 percent of the projected emissions compared to BAU in year 2020 (i.e., 15.7 percent of 507 $MMTCO_2e$) (CARB 2012b).

Key elements of CARB's GHG reduction plan that may be applicable to the proposed project include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards (adopted and cycle updates in progress).

- Achieving a mix of 33 percent for energy generation from renewable sources (anticipated by 2020).

[5] CARB defines BAU in its Scoping Plan as emissions levels that would occur if California continued to grow and add new GHG emissions but did not adopt any measures to reduce emissions. Projections for each emission-generating sector were compiled and used to estimate emissions for 2020 based on 2002–2004 emissions intensities. Under CARB's definition of BAU, new growth is assumed to have the same carbon intensities as was typical from 2002 through 2004.

- A California cap-and-trade program that links with other Western Climate Initiative (WCI) partner programs to create a regional market system for large stationary sources (adopted 2011).

- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets (several Sustainable Communities Strategies have been adopted).

- Adopting and implementing measures pursuant to state laws and policies, including California's clean car standards (amendments to the Pavley Standards adopted 2009; Advanced Clean Car standard adopted 2012), goods movement measures, and the Low Carbon Fuel Standard (LCFS) (adopted 2009).

- Creating target fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the state's long-term commitment to AB 32 implementation (in progress).

Table 5.6-3 shows the proposed reductions from regulations and programs outlined in the 2008 Scoping Plan. Although local government operations were not accounted for in achieving the 2020 emissions reduction, CARB estimates that land use changes implemented by local governments that integrate jobs, housing, and services result in a reduction of 5 $MMTCO_2e$, which is approximately 3 percent of the 2020 GHG emissions reduction goal. In recognition of the critical role that local governments play in the successful implementation of AB 32, CARB is recommending GHG reduction goals of 15 percent of today's levels by 2020 to ensure that municipal and community-wide emissions match the state's reduction target.[6] Measures that local governments take to support shifts in land use patterns are anticipated to emphasize compact, low-impact growth over development in greenfields, resulting in fewer VMT (CARB 2008).

[6] Although the Scoping Plan references a goal for local governments to reduce community GHG emissions by 15 percent from current (interpreted as 2008) levels by 2020, it does not rely on local GHG reduction targets established by local governments to meet the state's GHG reduction target of AB 32. Table 5.6-3 lists the recommended reduction measures, which do not include additional reductions from local measures.

Table 5.6-3 Scoping Plan GHG Reduction Measures and Reductions toward 2020 Target

Recommended Reduction Measures	Reductions Counted toward 2020 Target of 169 $MMTCO_2e$	Percentage of Statewide 2020 Target
Cap and Trade Program and Associated Measures		
California Light-Duty Vehicle GHG Standards	31.7	19%
Energy Efficiency	26.3	16%
Renewable Portfolio Standard (33 percent by 2020)	21.3	13%
Low Carbon Fuel Standard	15	9%
Regional Transportation-Related GHG Targets[1]	5	3%
Vehicle Efficiency Measures	4.5	3%
Goods Movement	3.7	2%
Million Solar Roofs	2.1	1%
Medium/Heavy Duty Vehicles	1.4	1%
High Speed Rail	1.0	1%
Industrial Measures	0.3	0%
Additional Reduction Necessary to Achieve Cap	34.4	20%
Total Cap and Trade Program Reductions	**146.7**	**87%**
Uncapped Sources/Sectors Measures		
High Global Warming Potential Gas Measures	20.2	12%
Sustainable Forests	5	3%
Industrial Measures (for sources not covered under cap and trade program)	1.1	1%
Recycling and Waste (landfill methane capture)	1	1%
Total Uncapped Sources/Sectors Reductions	**27.3**	**16%**
Total Reductions Counted toward 2020 Target	**174**	**100%**
Other Recommended Measures – Not Counted toward 2020 Target		
State Government Operations	1.0 to 2.0	1%
Local Government Operations	To Be Determined	NA
Green Buildings	26	15%
Recycling and Waste	9	5%
Water Sector Measures	4.8	3%
Methane Capture at Large Dairies	1	1%
Total Other Recommended Measures – Not Counted toward 2020 Target	**42.8**	**NA**

Source: CARB 2008.

Notes: The percentages in the right-hand column add up to more than 100 percent because the emissions reduction goal is 169 $MMTCO_2e$ and the Scoping Plan identifies 174 $MMTCO_2e$ of emissions reductions strategies.

$MMTCO_2e$: million metric tons of CO_2e

[1] Reductions represent an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target.

[2] According to the Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 million metric tons of CO_{2e} (or approximately 1.2 percent of the GHG reduction target). However, these reductions were not included in the Scoping Plan reductions to achieve the 2020 target.

2014 Update to the 2008 Scoping Plan

CARB has recently 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 to the Scoping Plan defines CARB's climate change priorities for the next five years and lays the groundwork to reach post-2020 goals in Executive Orders S-03-05 and B-16-2012. The update includes the latest scientific findings related to climate change and its impacts, including short-lived climate pollutants. The GHG target identified in the 2008 Scoping Plan is based on IPCC's GWP identified in the Second and Third Assessment Reports. IPCC's Fourth and Fifth Assessment Reports identified more recent GWP values based on the latest available science. CARB recalculated the 1990 GHG emission levels with the updated GWPs in the Fourth Assessment Report and the 427 $MMTCO_2e$ 1990 emissions level and 2020 GHG emissions limit, established in response to AB 32, is slightly higher at 431 MMTCO2e (CARB 2014a).

The update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the original 2008 Scoping Plan. As identified in the Update to the Scoping Plan, California is on track to meeting the goals of AB 32. However, the Update to the Scoping Plan 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 mid-term 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 2014a).

According to the Update to the Scoping Plan, 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 2014b). The new Executive Order B-30-15 requires CARB to prepare another update to the Scoping Plan to address the 2030 target for the State.

Senate Bill 375

In 2008, SB 375, the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reduction 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 regions in California managed by a metropolitan planning organization (MPO). Southern California Association of Governments (SCAG) is the MPO for the Southern California region, which includes the counties of Los Angele, 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. SCAG's targets

are an 8 percent per capita reduction from 2005 GHG emission levels by 2020 and a 13 percent per capita reduction from 2005 GHG emission levels by 2035 (CARB 2010).

The 2020 targets are smaller than the 2035 targets because a significant portion of the built environment in 2020 has been defined by decisions that have already been made. In general, the 2020 scenarios reflect that more time is needed for large land use and transportation infrastructure changes. Most of the reductions in the interim are anticipated to come from improving the efficiency of the region's transportation network. The targets would result in 3 $MMTCO_2e$ reductions by 2020 and 15 $MMTCO_2e$ reductions by 2035. Based on these reductions, the passenger vehicle target in CARB's Scoping Plan (for AB 32) would be met (CARB 2010).

CARB is currently in the process of updating the next round of targets and methodology to comply with the requirement that targets are updated every eight years. Considerations for the next round of targets include whether to change the nature or magnitude of the emissions reduction targets for each of the MPOs. Additionally, CARB is also considering whether the target setting methodology should account for advances in technology that reduces emissions. The latter change in methodology would permit cities to account for emissions reductions from advances in cleaner fuels and vehicles and not only from land use and transportation planning strategies.

SCAG's 2012 RTP/SCS

SB 375 requires the MPOs to prepare a Sustainable Communities Strategy (SCS) in their regional transportation plan. For the SCAG region, the 2012 Regional Transportation Plan/Sustainable Communities Strategy (RTP/ SCS) was adopted in April 2012 (SCAG 2012). The SCS establishes a development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, would reduce GHG emissions from transportation (excluding goods movement). The SCS is meant to provide growth strategies that will achieve the regional GHG emissions reduction targets. However, the SCS does not require that local general plans, specific plans, or zoning be consistent with the SCS, but provides incentives for consistency for governments and developers.

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 is 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 year 2017 through 2025 light-duty vehicles. In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025 (see also the discussion on the update to the CAFE standards under *Federal Laws*, above). The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer global warming gases 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 within the state. Executive Order S-1-07 sets a declining standard for GHG emissions measured in CO_2e gram per unit of fuel energy sold in California. The LCFS requires 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 LCFS applies to refiners, blenders, producers, and importers of transportation fuels and would use market-based mechanisms to allow these providers to choose how they reduce emissions during the fuel cycle using the most economically feasible methods.

Executive Order B-16-2012

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

Senate Bills 1078 and 107 and Executive Order S-16-08

A major component of California's Renewable Energy Program is the renewable portfolio standard (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. Executive Order S-16-08 was signed in November 2008, which expands the state's renewable energy standard to 33 percent renewable power by 2020. In 2011, the state legislature adopted this higher standard in 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.

California Building Code

Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission in June 1977 and updated triannually, and most recently revised in 2013 (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. On May 31, 2012, the CEC adopted the 2013 Building and Energy Efficiency Standards, which went into effect on July 1, 2014. Buildings that are constructed in accordance with the 2013 Building and Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the 2008 standards as a result of better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in homes and businesses.

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (CALGreen) was adopted as part of the California Building Standards Code (Part 11, Title 24, California Code of Regulations). 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.[7] The mandatory provisions of the California Green Building Code Standards became effective January 1, 2011 and were updated most recently in 2013.

2006 Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) were adopted by the California Energy Commission 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.

Regulation of GHG Emissions on a Local Level

City of Sierra Madre Energy Action Plan

The City of Sierra Madre prepared the Energy Action Plan (EAP) in conjunction with the San Gabriel Valley Council of Governments (SGVCOG), a SCAG subregion, and Southern California Edison (SCE) as part of supporting the California Long-Term Energy Efficiency Strategic Plan (CEESP). The EAP, although not officially adopted by the City, is a stand-alone document and was prepared with the intention of serving as an equivalent to an electricity efficiency chapter of a climate action plan. It identifies both municipal and community-wide strategies to achieve long-term electricity efficiency goals. It also serves as part of the state and regional effort for achieving energy efficiency and reducing GHG emissions. The specific objectives of the EAP are to:

- Create a long-term vision for energy efficiency;
- Provide and assess information related to energy use and GHG emissions;
- Establish reduction targets for energy efficiency;
- Identify goals, policies, and actions to achieve energy reductions; and
- Provide a framework to implement the identified goals, policies, and actions.

Under the premise of meeting the State-recommended GHG reduction target of 15 percent below baseline levels by year 2020, the EAP sets the following energy efficiency targets for Sierra Madre:

- Reduce annual existing residential electricity usage by 3,445,656 kilowatt-hours (kWh) to achieve a 10 percent reduction below year 2010 baseline residential electricity use by year 2020.

- Reduce annual existing nonresidential electricity use by 1,272,644 kWh to achieve a 10 percent reduction below year 2010 baseline nonresidential electricity use by year 2020.

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

- Reduce annual municipal electricity use by 342,140 kWh to achieve a 10 percent reduction below year 2010 baseline municipal electricity use by year 2020.

- Achieve a net zero electricity in new residential and nonresidential buildings by 2020.

The EAP strategy to meet these electricity reduction targets involves setting goals, policies, and implementation actions focused around seven topic areas. The seven topic areas are 1) Existing Residential Buildings, 2) Existing Nonresidential Buildings, 3) New Development, 4) Planning Framework, 5) Urban Cooling, 6) Water & Electricity Efficiency, and 7) Municipal Operations. The goals corresponding to these seven topic areas include:

- **Goal 1:** Achieve maximum energy efficiency of the City's aging housing stock while reducing energy costs and enhancing the quality of historic and unique residences.

- **Goal 2:** Energy efficiency will strengthen the operational efficiency, quality, and viability of local businesses and the City's village core.

- **Goal 3:** All new development and significant remodels will have a net zero community-wide energy demand by 2020.

- **Goal 4:** Integrate energy efficiency in the City's regulatory and policy framework.

- **Goal 5:** Enhance the quaint, tree-lined, and pedestrian-scale nature of existing neighborhoods.

- **Goal 6:** Integrate water-related energy conservation and efficiency practices in new and existing development.

- **Goal 7:** Reduce municipal electricity use at City facilities 10 percent below baseline 2010 levels by 2020.

City of Sierra Madre Municipal Code

The City has adopted and incorporated the 2013 California Green Building Standards Code into Chapter 15.30 (Green Building Standards Code) of the municipal code.

5.6.1.3 EXISTING CONDITIONS

Table 5.6-4 identifies the existing community GHG emissions inventory for the City of Sierra Madre. GHG emissions generated within the City were estimated using CalEEMod.

Table 5.6-4 Existing City of Sierra Madre GHG Emissions Inventory

Sector	GHG Emissions $MTCO_2e$/Year	Percent of Emissions
Area	1,285	1%
Energy	20,052	18%
Mobile[1]	82,408	73%
Waste	5,668	5%
Water	3,449	3%
Total	**112,863**	**100%**

Source: CalEEMod, Version 2013.2.2.
Note: $MMTCO_2e$: million metric tons of CO_2e
[1] Based on year 2013 emission rates.

5.6.2 Thresholds of Significance

According to Appendix G of the California Environmental Quality Act (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.

5.6.2.1 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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

- **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 (i.e., city or county), 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, SCAQMD requires an assessment of GHG emissions. SCAQMD is proposing a "bright-line" screening-level threshold of 3,000 $MTCO_2e$ annually for all land use types or the following land-use-specific thresholds: 1,400 $MTCO_2e$ for commercial projects, 3,500 $MTCO_2e$ for residential projects, or 3,000 $MTCO_2e$ for mixed-

use projects. This bright-line threshold is based on a review of the Governor's Office of Planning and Research database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal, and therefore, less than cumulatively considerable impact on GHG emissions:

- **Tier 3.** If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant.

- **Tier 4.** If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted.

SCAQMD has proposed an efficiency target for projects that exceed the screening threshold. The current recommended approach is per capita efficiency targets. SCAQMD is not recommending use of a percent emissions reduction target. Instead, SCAQMD proposes 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., program-level projects such as general plans). Service population is defined as the sum of the residential and employment populations provided by 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.[8] For the purpose of this project, SCAQMD's plan-level efficiency threshold is used to evaluate the new land uses associated with the General Plan Update. If projects exceed both the screening criteria and this per capita efficiency target, GHG emissions would be considered potentially significant in the absence of mitigation measures.

5.6.3 Relevant General Plan Policies and Implementation Program Measures

The following are relevant policies and implementation measures of the Sierra Madre General Plan Update and Implementation Program, respectively, which are designed to reduce potential GHG emissions impacts associated with implementation of the General Plan Update.

General Plan Update Policies

Land Use Element

- **Policy L1.6:** Require that new residential development, substantial remodeling and additions comply with all adopted water conservation measures that reduce and minimize the impact on the City's water supply and its ability to serve its water customers.

- **Policy L4.3:** Ensure that new development and the expansion of existing uses incorporate water conservation measures that reduce and minimize the impact on the City's water supply and its ability to serve its customers.

[8] SCAQMD 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.

- **Policy L8.1:** Encourage the use of sustainable materials in the design and construction of structures and landscapes.

- **Policy L8.2:** Incorporate water conservation measures in the zoning development standards for new construction and substantial remodeling or building expansion, including but not limited to green building construction, the percentage of permeable ground surfaces, building floor area limitations, lot coverage, landscaping and irrigation, greywater plumbing requirements, rainwater capture, and design review.

- **Policy L8.3:** Consider a water impact fee to apply to new residential dwelling units and additions to existing development that increase water consumption, to fund water fixture retrofits of existing homes and other water conservation measures.

- **Policy L8.5:** Provide incentives for property owners to retrofit historically designated homes with water saving fixtures.

- **Policy L15.4:** Limit the use of irrigation systems in landscaping to comply with water conservation measures and provide for natural habitat and erosion control.

- **Policy L16.1:** Minimize the amount of grading and removal of natural vegetation.

- **Policy L16.2:** Require that home sites be planned, developed and designed to:
  - Eliminate fire hazards.
  - Prevent land instability.
  - Prevent exposure to geological and geotechnical hazards.
  - Provide adequate drainage controls to prevent flooding and landslides.
  - Prevent any other hazard or threat to the public health, safety, and welfare.
  - Use the minimum amount of water possible for landscaping and interior uses.

- **Policy L26.4:** Provide incentives for property owners to retrofit historically designated properties with water saving fixtures.

- **Policy L28.1:** Encourage adaptive reuse of the existing structures and prohibit the demolition and replacement of residential structures with development which contains commercial uses only.

- **Policy L29.1:** Allow for existing structures to be converted to limited office and business use, but require that any new development (construction) include residential uses or both residential and limited business uses.

- **Policy L41.2:** Allow for the expansion of existing institutional sites, including height and density beyond that allowed in adjacent commercial and residential areas, provided that a comprehensive master plan is approved by the City which demonstrates that the project:
  - Contains activities and functions which will be a significant asset for the City.
  - Adequately mitigates all impacts attributable to the increase in floor area ratio and height.
  - Conveys the village theme in its siting of structures, massing, scale, use of open space and architectural character.
  - Preserves historic structures to the maximum extent possible.
  - Provides additional benefits to the community above those which can be exacted to account for the direct impacts of the development. Such benefits can include making available parking to the public when not needed for the use, dedicating on-site recreational space or parkland facilities for public meetings, making day care available to the public, contributing to park site acquisition, and offsetting impacts to historic structures with monetary contribution to a preservation fund.
  - Will not displace or encroach into existing commercial uses.
  - Incorporates water conservation practices such as but not limited to greywater plumbing, permeable ground surfaces, drought tolerant landscaping, green building materials, rainwater capture devices, and low- flow fixtures.
- **Policy L49.7:** Improve pedestrian connections between the street and the public parking lots through signage, coordination with property owners, purchase of properties and other mechanisms.
- **Policy L49.9:** Encourage outdoor dining, sidewalk sales, street fairs, and other uses of the sidewalk which encourage pedestrian activity.
- **Policy L51.3:** Maintain existing facilities for bicyclists, pedestrians, and transit users.
- **Policy L51.4:** Explore the development of new facilities for bicyclists, pedestrians and transit users.
- **Policy L51.5:** Encourage and support the use of non-automotive travel throughout the City.
- **Policy L51.6:** Encourage City staff, employees, residents and visitors to walk and bicycle as often as possible.
- **Policy L51.7:** Utilize non-automotive transportation solutions as a tool to further goals related to environmental sustainability and economic development.
- **Policy L51.8:** Prioritize improvements for non-vehicular modes like bicycles, pedestrians, and transit to eliminate the need for new or expanded roadways and intersection improvements like traffic signals.

- **Policy L52.1:** Ensure that all pedestrians, particularly seniors and the disabled, are able to travel safely and easily throughout the City.
- **Policy L52.2:** Prioritize opportunities to implement traffic calming techniques and limit new driveway curb cuts along roadways, such as Sierra Madre Boulevard and East Montecito.
- **Policy L52.3:** Provide safe travel routes for bicyclists including designated bicycle lanes on streets where these facilities can be accommodated.
- **Policy L52.4:** Evaluate the impact of any capital improvement project on the travel needs of bicycles, pedestrians, and vehicle users.
- **Policy L52.6:** Improve pedestrian crossing opportunities work to increase pedestrian safety, and eliminate painted crosswalks where they provide a false sense of security, and make a more concerted effort to enforce laws related to pedestrian safety.
- **Policy L52.7:** Create and implement a City bikeway plan.
- **Policy L52.8:** Require the incorporation of bicycle facilities into the design of land use plans and capital improvements, including bicycle parking within new multi-family and non-residential sites or publicly accessible bicycle parking.
- **Policy L52.9:** Explore the possibility of sidewalk continuity where feasible.

Resource Management Element

- **Policy R6.2:** Discourage continuous all-night exterior lighting and encourage motion-sensored lighting.
- **Policy R7.1:** The City shall use the lowest wattage of lamp that is feasible and encourage the public to do the same.
- **Policy R7.2:** The City shall, whenever possible, turn off the lights or use motion sensor-controlled lighting and encourage the public to do the same.
- **Policy R7.3:** Investigate the possibility of having businesses turn off lights when they are closed.
- **Policy R12.4:** Identify ways in which reclaimed water can be utilized in Sierra Madre.
- **Policy R15.1:** Prohibit washing of concrete surfaces such as sidewalks and driveways with a hose.
- **Policy R15.4:** Restrict hours of water usage for landscape and irrigation.

- **Policy R17.1:** Diligently carry out minimum control measures and source reduction programs as required and/or is beneficial to water quality.

- **Policy R19.1:** Require the waste collection provider to provide recycling bins to all customers in the City, including in the business district. Cardboard should be collected at sites in the business district.

- **Policy R19.3:** Continue to enforce the Construction and Demolition Ordinance to require builders to separate and recycle discarded building materials, including lumber, metal, cement, etc.

- **Policy R19.4:** City offices shall purchase and use post -consumer and feasible.

- **Policy R19.5:** Promote green waste and recycling programs such as "green and clean" which increase the usage of green waste for compost and reduces the amount of green waste exported.

- **Policy R22.1:** Cooperate with the South Coast Air Quality Management District and incorporate the provisions of the Air Quality Management Plan.

- **Policy R22.2:** Prohibit the development of land uses and land use practices which would contribute significantly to poor air quality.

- **Policy R22.3:** Establish controls and monitor uses in the City which contain operations or materials characterized by air pollutants which individually or cumulatively could significantly add to the air basin's degradation (e.g., furniture manufacturers using paints and finishes, automobile repair, printing, and reproduction, and dry cleaners).

- **Policy R22.4:** Encourage and participate in regional initiatives and programs to improve the South Coast Air Basin's air quality.

- **Policy R22.5:** Publicize the incentives offered by the Southern California Air Quality Management District, such as leaf blower and lawnmower exchanges.

- **Policy R23.1:** Establish a transportation system management program to encourage the use of transit, carpooling, shuttles and other transportation options to reduce vehicle miles traveled and vehicle trips.

- **Policy R23.2:** Encourage public and school bus owners to convert to lower emission burning fuel, which is part of the Southern California Air Quality Management District Plan.

- **Policy R23.3:** Continue to purchase automobiles and other vehicles that use zero or low emission fuels for the City's fleet of vehicles.

- **Policy R23.4:** Allow for local job opportunities including home based businesses and telecommuting in Sierra Madre.

- **Policy R23.5:** Provide opportunities through appropriate zoning for the development of residential units in concert with commercial uses.
- **Policy R23.6:** Provide and enhance local transit service to reduce personal vehicle trips.
- **Policy R23.7:** Maintain links to the MTA Gold Line light rail system.
- **Policy R23.8:** Pursue funding sources for facilities and programs linked to regional transit.
- **Policy R24.1:** Continue to review guidelines from time to time regarding the use of gas-powered lawn equipment, and consider tightening the restrictions on the type of equipment, hours and duration of operation.

Community Services Element

- **Policy C26.1:** Explore other transit funding sources.
- **Policy C26.2:** Develop inter-jurisdictional coordination of the transportation program with Arcadia and/or Pasadena, thereby sharing the cost of the program.
- **Policy C26.4:** Continue to provide the free fixed route services for the community.
- **Policy C26.5:** Continue to coordinate discounted transit services for seniors, handicapped individuals, or low- income residents.
- **Policy C27.1:** Continue to provide comprehensive information to the transit user that is informative, accessible, and easy to understand.
- **Policy C28.1:** Continue to work with the Los Angeles County Metropolitan Transit Authority (Metro) to maintain the existing bus routes linking the City to the Gold Line train station in Pasadena and Arcadia.
- **Policy C30.6:** Offer bicycle safety and traffic courses for the community sponsored by the Police and Community Services Departments.

Implementation Program Measures

Land Use Implementation Program

- **Measure IM-3:** The City shall amend the Municipal Code as necessary to include a requirement for compliance with all adopted water conservation measures.
- **Measure IM-51:** The City shall amend the C (Commercial) Zoning Ordinance as necessary to prohibit new and the expansion of institutional facilities, allow a diversity of commercial uses for local residents

and visitors, allow residential uses at the rear and above the first floor, and establish a minimum depth for commercial uses with residential at the rear.

- **Measure IM-53:** The City shall amend the M (Manufacturing) Zoning Ordinance as necessary to allow adaptive reuse of existing structures for mixed-use, light manufacturing that supports design-related industries, a diversity of craft-related businesses, entertaining/specialty stores, professional offices, live/work space, and housing units on the second level or to the rear of buildings.

- **Measure IM-56:** The City shall amend the M (Manufacturing) Zoning Ordinance to change the title to "Artisan Mixed Use" Zoning Ordinance and include regulations regarding commercial, light-manufacturing and residential uses, including maximum allowable floor area requirements.

Economic Development Implementation Program

- **Measure IM-4:** The City shall develop a plan that addresses parking, walkability, and pedestrian activity in the core area.

Circulation Implementation Program

- **Measure IM-3:** The City shall continue to set aside sufficient budget to maintain facilities for bicyclists (such as signage and pavement marking), pedestrians and transit users. The City shall also consider whether additional funds are available to develop new facilities.

- **Measure IM-4:** The City shall prepare and implement a Citywide Sidewalk Master Plan, to include sidewalk maintenance and prioritization of sidewalk infill projects.

- **Measure IM-5:** The City shall analyze opportunities to provide bicycle facilities in the city and include them in the new bikeway plan where appropriate.

- **Measure IM-8:** The City shall review Municipal Code Sections relating to parking, crosswalks, and pedestrian safety and amend as necessary.

- **Measure IM-9:** The City shall publicize and encourage the use of public transportation programs, such as light rail, bus, and paratransit services.

Tree Preservation Implementation Program

- **Measure IM-1:** The City shall continue to enforce the City's existing Tree Preservation Ordinance.

- **Measure IM-**3: The City shall implement the recommendations of the Community Forest Management Plan.

Waste Management and Recycling Implementation Program

- **Measure IM-2:** The City shall encourage recycling through the purchase of recycled products, enforcement of recycling of construction and demolition debris, and the promotion of composting and green waste programs.

Air Quality Implementation Program

- **Measure IM-1:** The City shall ensure that it complies with the South Coast Air Quality Management District Air Quality Management Plan, and other regional initiatives and programs to improve air quality.

- **Measure IM-2:** The City shall continue to assess the air quality impacts from proposed developments and land uses through the environmental review process.

- **Measure IM-3:** The City shall continue to enforce and abide by the requirements of the South Coast Air Quality Management District regarding air pollutant thresholds.

- **Measure IM-4:** Staff shall keep apprised of incentives offered by the South Coast Air Quality Management District and shall provide that information to the community.

- **Measure IM-5:** The City shall purchase low or zero emissions alternate-fuel vehicles for its fleet wherever possible.

- **Measure IM-6:** The City shall create a transportation brochure to provide the public with multiple options for reducing miles traveled and vehicle trips.

- **Measure IM-7:** The City shall continue home-based businesses pursuant to the Home Occupation Permit Ordinance.

- **Measure IM-8:** The City shall continue to allow residential business above or at the rear of commercial uses in the Commercial Zone.

- **Measure IM-9:** The City shall continue to provide the fixed route local transportation services and provide increase social media marketing for greater public awareness.

- **Measure IM-10:** The City shall continue to partner with MTA and attend quarterly meetings to ensure access to the Gold Line light rail system.

- **Measure IM-11:** The City shall partner with regional transit providers to identify funding sources to expand transportation programs.

- **Measure IM-12:** The City shall continue to enforce the Noise Ordinance and amend as necessary with respect to the use of gas-powered lawn equipment.

- **Measure IM-13:** The City shall continue to enforce dust abatement measures during grading and construction.

- **Measure IM-14:** The City shall continue to enforce applicable City ordinances, as well as regional regulations pertaining to fugitive dust control.

Transit Services Implementation Program

- **Measure IM-4:** The City will maintain contractual agreements with the transit provider to continue to provide the fixed route service at no cost to users.

- **Measure IM-**6: The City will continue to attend Metro meetings to maintain services within Sierra Madre and access to the Goldline Station.

- **Measure IM-**8: The City will consider the availability of City parking lots to determine whether a Park-and-Ride lot is feasible.

- **Measure IM-**12: The City will develop a new program that teaches bicycle safety.

5.6.4 Environmental Impacts

Methodology

This GHG evaluation was prepared in accordance with the requirements of CEQA to determine if significant GHG impacts are likely to occur in conjunction with future development that would be accommodated by the General Plan Update.[9] The analysis in this section is based on buildout of the proposed land uses of the General Plan Update as modeled using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2., for the following sectors:

- **Transportation:** GHG emissions are based on the trip generation provided in the Traffic Impact Study prepared by Fehr and Peers (see Appendix E to this DEIR).

- **Solid Waste Disposal:** Indirect emissions from waste generation are based on CalRecycle waste generation rates.

- **Water/Wastewater:** GHG emissions from electricity used to supply water, treat water, distribute water, and treated wastewater are based on the City's 2010 Urban Water Management Plan and CalEEMod wastewater generation factors.

- **Area Sources:** GHG emissions are from use of landscaping equipment used for property maintenance.

[9] The methodology used in completing the GHG inventory was employed for purposes of fulfilling the requirements of CEQA and may differ from the methodology used in completing the GHG inventory found in the City's Energy Action Plan.

- **Energy:** GHG emissions from use of electricity and natural gas by residential and non-residential land uses. New buildings are assumed to comply with the 2013 Building and Energy Efficiency Standards, which are 25 and 30 percent more energy efficient for residential and nonresidential buildings, respectively, than the 2008 standards.

Life cycle emissions are not included in this analysis because not enough information is available for the General Plan Update, and therefore life cycle GHG emissions would be speculative.[10] GHG modeling is included in Appendix C of this DEIR.

Impact Analysis

The following impact analysis addresses thresholds of significance for which the Notice of Preparation (see Appendix A) disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

For the impact analysis of all thresholds below, it should be noted that the large infill opportunity site shown in Figure 3-5*, Infill Opportunity Sites*, just north of Carter Avenue, which is associated with the residential subdivision known as Stonegate, is an approved development project and was analyzed under separate environmental documentation in accordance with CEQA. The GHG-emissions-related impact resulting from Stonegate were addressed and mitigated for in that environmental documentation. Also, all residential lots within Stonegate are subject the provisions of the City's Municipal Code and the Hillside Management zone regulations (Chapter 17.52) of the City's Municipal Code, , which requires that each residential development within Stonegate obtain approval of a hillside development permit.

For the purpose of the following analysis, it is also important to note that, based on the requirements of CEQA, this analysis is based on a comparison to existing land uses and does not address the differences that would result from a comparison with the existing General Plan land use map, from which there is little variation when compared to the proposed General Plan land use map.

Furthermore, it is important to note that while the General Plan Update establishes City-wide policy level guidance, includes a revision to the current land use plan (see Figures 3-4, *Current Land Use Plan*, and 3-6, *Proposed Land Use Plan*), and modifies the development potential of certain parcels in the City (see Figure 3-5, *Infill Opportunity Sites*), it does not contain specific development project proposals. The General Plan Update is a regulatory document that sets forth the framework for future growth and development (e.g., infill development, redevelopment, and revitalization/restoration) in the City and does not directly result in development in and of itself. Before any development can occur in the City, all such development is required to be analyzed for conformance with the City's General Plan, zoning requirements, and other applicable local

[10] 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).

and state requirements; comply with the requirements of CEQA (e.g., preparation of site-specific environmental documentation in accordance with CEQA); and obtain all necessary approvals, clearances, and permits.

Impact 5.6-1: Implementation of the General Plan Update would result in a net decrease of GHG emissions compared to existing conditions and would not have a significant impact on the environment. [Threshold GHG-1]

Impact Analysis: Future development that would be accommodated under the General Plan Update would contribute to global climate change through direct and indirect emissions of GHG from land uses within the City.

General Plan Buildout

The change in GHG emissions is based on the difference between existing land uses and land uses associated with buildout of the General Plan Update. The community-wide GHG emissions inventory for the City of Sierra at buildout (post-2035) compared to existing conditions is provided in Table 5.6-5. The post-2035 inventory includes reductions from federal and state measures identified in CARB's Scoping Plan, including the Pavley fuel efficiency standards, LCFS for fuel use (transportation and off-road), and state reductions for non-transportation measures. It is likely that new federal and state programs would be adopted, resulting in further GHG reductions post-2035.

Table 5.6-5 Post-2035 City of Sierra Madre GHG Emissions Inventory

	GHG Emissions in $MTCO_2e$/Year				
Sector	Existing 2013	General Plan Buildout With State & Federal Reductions	General Plan Buildout Percent of Total	Change from 2013	Percent Change from 2013
Area	1,285	1,316	1%	31	2%
Energy	20,052	20,698	21%	645	3%
Mobile	82,408	69,079	69%	-13,329	-16%
Waste	5,668	5,827	6%	159	3%
Water	3,449	3,553	4%	104	3%
Total	**112,863**	**100,474**	**100%**	-12,389	-5%
Service Population (SP)[1]	12,636	13,036	—	—	—
$MTCO_2e$/SP	8.9 $MTCO_2e$/SP	7.7 $MTCO_2e$/SP	—	—	—

Source: CalEEMod, Version 2013.2.2.
[1] Existing based on a service population of 11,030 people and 1,606 employees in the City of Sierra Madre. General Plan Update buildout based on a service population of 11,306 people and 1,730 employees in the City of Sierra Madre.

Compared to the existing emissions inventory, the City of Sierra Madre would experience a decrease of 12,389 $MTCO_2e$ of GHG emissions at buildout as a result of regulations adopted to reduce GHG emissions and turnover of California's on-road vehicle fleets. As identified by the California Natural Resources Agency's "Final Statement of Reasons for Regulatory Action, Amendments to the State CEQA Guidelines Addressing Analysis and Mitigation of Greenhouse Gas Emissions Pursuant to Senate Bill 97" (2009), the CEQA

Guidelines do not establish a zero emissions threshold of significance because there is no one molecule rule in CEQA. Therefore, emissions generated by additional growth in the City would be offset by a reduction in existing emissions from implementation of federal and state regulations. As a result, the City of Sierra Madre would not experience an increase in GHG emissions at buildout of the General Plan Update. GHG emissions generated in the City would be approximately 5 percent less than the City's 2013 community GHG emissions, even with the additional growth that would be accommodated under the General Plan Update. Therefore, project-related impacts would not be significant.

Impact 5.6-2: Growth of the City under the General Plan Update would not meet the GHG emissions reduction targets of Executive Orders B-30-15 and Executive Order S-03-05 without additional federal, state, and local GHG reduction measures and plans. [Threshold GHG-2]

Impact Analysis: The following discusses the consistency of the General Plan Update to the CARB Scoping Plan and SCAGs 2012 RTP/SCS in addition to the City's Energy Action Plan.

CARB Scoping Plan

In accordance with AB 32, CARB developed the Scoping Plan to outline the state's strategy to achieve 1990 level emissions by year 2020. To estimate the reductions necessary, CARB projected statewide 2020 BAU GHG emissions and identified that the state as a whole would be required to reduce GHG emissions by 28.5 percent from year 2020 BAU to achieve the targets of AB 32 (CARB 2008). Since release of the 2008 Scoping Plan, CARB has updated the 2020 GHG BAU forecast to reflect GHG emissions in light of the economic downturn and measures not previously considered in the 2008 Scoping Plan baseline inventory. The revised BAU 2020 forecast shows that the state would have to reduce GHG emissions by 21.6 percent from BAU without Pavley and the 33 percent RPS, or 15.7 percent from the adjusted baseline (i.e., with Pavley and 33 percent RPS) (CARB 2012b).

Since adoption of the 2008 Scoping Plan, state agencies have adopted programs identified in the plan, and the legislature has passed additional legislation to achieve the GHG reduction targets. Statewide strategies to reduce GHG emissions include the LCFS, California Appliance Energy Efficiency regulations, California Building Standards (i.e., CALGreen and the 2013 Building and Energy Efficiency Standards), 33 percent RPS, and changes in the corporate average fuel economy standards (e.g., Pavley I and California Advanced Clean Cars [Pavley II]). Future individual development projects that would be accommodated under the General Plan Update would comply with these state GHG emissions reduction measures as they are statewide strategies. Therefore, the implementation of the General Plan Update would not obstruct implementation of the CARB Scoping Plan. However, for the purpose of this environmental assessment, the community GHG inventory and forecast for the City was also compared to the long-term GHG reduction goals of the state to provide a conservative assessment of the targets requested of local governments by CARB.

Although Table 5.6-5, *Post-2035 City of Sierra Madre GHG Emissions Inventory*, identifies that buildout of the General Plan Update would result in less emissions than currently generated in the City, the overall goal in the state is to achieve an 80 percent reduction from 1990 levels by 2050. In 2014, CARB adopted an update to the Scoping Plan. As identified in the update, as California continues to build its climate policy framework,

and there is a need for local government climate action planning to adopt midterm and long-term reduction targets that are consistent with scientific assessments and the statewide goal of reducing emissions 80 percent below 1990 levels by 2050. CARB identifies that local government reduction targets should chart a reduction trajectory that is consistent with, or exceeds, the trajectory created by statewide goals (CARB 2014a). Table 5.6-6 estimates a goal for 2035 that would place the state and the City of Sierra Madre on track to achieve the long-term emissions reduction goals of Executive Order S-03-05.

Table 5.6-6 Statewide Trajectory to Achieve Interim Goal under Executive Order S-03-05

Year	Description	CARB 2008 Scoping Plan ($MMTCO_2e$)		CARB 2014 Scoping Plan and Inventory Update ($MMTCO_2e$)	
		Second Assessment Report GWP[2]	Percent Reduction to Target	Fourth Assessment Report GWP[2]	Percent Reduction to Target
1990	AB 32 and Executive Order S-03-05 base year	433.29	—	431.00	—
2008	Percent Reduction from 2008 to meet 1990 level	512.40	15%	487.10	12%
2012	Percent Reduction from 2012 to meet 1990	—	—	458.68	6%
2030	Percent Reduction from 2012 to meet 40 percent below 1990 levels (EO B-30-15)	—	—	258.60	44%
2035	Percent Reduction from 2012 to be on a Trajectory in 2035 that would meet the 80 percent below 1990 levels (EO B-30-15 and EO S-03-05)	—	—	215.50	53%
2035	2035 Interim Target for City of Sierra Madre based on 2013 Inventory			59,837 $MTCO_2e$	
2035	Reductions needed by 2035 to be on a Trajectory Toward the Long-Term Target			53,026 $MTCO_2e$	

Notes:
GWP: global warming potential; $MTCO_2e$: metric tons of carbon dioxide-equivalent; $MMTCO_2e$: million metric tons of carbon dioxide-equivalent
[1] CARB 2008.
[2] CARB 2014a and CARB 2014b.

To meet the mid-term year 2030 reduction goal of Executive Order B-30-15, the City would need to reduce GHG emissions by 49,232 $MTCO_2e$ to achieve an emissions inventory of 63,631 $MTCO_2e$. To place Sierra Madre on a trajectory to meet the long-term GHG reduction goal of d Executive Order S-03-05 in consideration of the mid-term reduction goal set by Executive Order B-30-15, the City would need to reduce GHG emissions by 59,837 $MTCO_2e$ to achieve an emissions inventory of 53,026 $MTCO_2e$ in 2035. The City would require assistance from additional federal and state programs and regulations to achieve the long-term GHG emissions goal. Due to the magnitude of emissions reductions required statewide to achieve an interim target consistent with Executive Order S-03-05, such an achievement is unlikely for the majority of jurisdictions in California without additional federal and state programs and regulations. The Scoping Plan Update assessed programs to achieve the 2020 target for the state, but at this time, no additional GHG reductions programs are available that achieve the post-2020 target. The California Council on Science and Technology determined that the state cannot meet the 2050 goal without major advancements in technology

(CCST 2012). Therefore, impacts from GHG emissions in the City of Sierra Madre would be significant in the absence of federal, state, and local plans to achieve the long-term GHG reduction targets for the state.

SCAG's 2012 RTP/SCS

SCAG's 2012 RTP/SCS is a regional growth-management strategy that targets per capita GHG reduction from passenger vehicles and light-duty trucks in the Southern California region. The 2012 RTP/SCS incorporates local land-use projections and circulation networks in city and county general plans. The projected regional development pattern, including locations of land uses and residential densities included in local general plans, when integrated with the proposed regional transportation network identified in the 2012 RTP/SCS, would reduce per capita vehicular travel-related GHG emissions and achieve the GHG reduction per capita targets for the SCAG region of 8 percent per capita from 2005 GHG emission levels by 2020 and 13 percent per capita from 2005 GHG emission levels by 2035. Table 5.7-1, *Consistency with SCAG's 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy Goals*, of Section 5.7, *Land Use and Planning*, provides an assessment of the proposed project's relationship to the applicable 2012 RTP/SCS goals. As identified in this table, the General Plan Update and its policies would be consistent with the applicable 2012 RTP/SCS goals. Implementation of General Plan Update Policies L29.1, L35.4, L37.1, L37.6, and L38.2 and creation of the Artisan Mixed Use land use designation (see Figure 3-6, *Proposed Land Use Plan*) would encourage mixed-use development. These policies, in addition to General Plan Update circulation policies associated with improving pedestrian and bicycle networks and facilities would contribute to reducing overall VMT per capita and GHG emissions from passenger vehicles. Therefore, the General Plan Update is considered to be consistent with SCAG's 2012 RTP/SCS.

City of Sierra Madre Energy Action Plan

Table 5.6-7 evaluates the General Plan Update's consistency with the goals and policies contained in the City's EAP. The EAP goals and policies focus on reducing GHG emissions through reducing citywide and municipal electricity demand (Sierra Madre 2012). As shown in the table, a wide range of measures are covered and include retrofits of existing land uses; development of new more energy efficient land uses; use of energy-efficient appliances; use of shade trees; and water conservation. The General Plan Update Dark Sky and Tree Preservation policies in addition to the various policies pertaining to water conservation and efficiency would be aligned with the focus of the EAP in reducing community-wide energy usage. Therefore, overall, the General Plan Update would generally not be inconsistent with the City's EAP.

Table 5.6-7 Consistency with the City of Sierra Madre Energy Action Plan

EAP Goal	EAP Policies	Compliance with Goals
Goal 1: Achieve maximum efficiency of the City's aging housing stock while reducing energy costs and enhancing the quality of historic and unique residences.	**Policy 1.1:** Promote household energy conservation by residents in existing structures through education and outreach.	**Consistent:** The General Plan Update does not contain policies or implementation measures pertaining to energy retrofits of existing housing units. However, with implementation of Mitigation Measures 6-1, the energy measures of the EAP would be integrated into the applicable elements of the General Plan Update.
	Policy 1.2: Encourage residential upgrades to more energy-efficient, cost-saving appliances and equipment.	
	Policy 1.3: Protect and preserve the City's mature housing stock by encouraging voluntary residential retrofits.	
Goal 2: Energy efficiency will strengthen the operational efficiency, quality, and viability of local businesses and the City's village core.	**Policy 2.1:** Promote commercial energy conservation by business in existing structures through education and outreach.	**Consistent:** Policies under the Dark Sky Section of the Resource Management Element would discourage continuous all-night exterior light fixtures and promote use of motion-sensored light systems in addition to having business turn off lights during off hours. Applicable policies include: **Policies R6.2, R7.1, R7.2, and R7.3.**
	Policy 2.2: Support the use of energy-efficient appliances and equipment in leased and owner-occupied business.	
	Policy 2.3: Preserve and enhance the downtown business core by facilitating retrofits and energy efficiency improvements within the nonresidential building stock.	
	Policy 2.4: Encourage energy efficiency benchmarking as a tool to help businesses assess and identify opportunities to improve business energy performance.	
Goal 3: All new development and significant remodels will have a net zero community-wide energy demand by 2020.	**Policy 3.1:** Maximize the energy efficiency of new buildings through a community-wide green building framework.	**Consistent:** The General Plan Update does not contain policies or implementation measures pertaining to promoting energy efficiency of new development projects. However, with implementation of Mitigation Measures 6-1, the energy measures of the EAP would be integrated into the applicable elements of the General Plan Update.
	Policy 3.2: Encourage the use of smart-grid-integrated and energy star appliances in new development.	
Goal 4: Integrate energy efficiency in the City's regulatory and policy framework.	**Policy 4.1:** Encourage energy efficiency through development standards, permitting, and plan review processes.	**Consistent:** The General Plan Update does not contain policies or implementation actions pertaining to integrating energy efficiency into the City's regulatory and policy framework. However, with implementation of Mitigation Measures 6-1, the energy measures of the EAP would be integrated into the applicable elements of the General Plan Update.
	Policy 4.2: Enhance the City's historic preservation process to facilitate energy efficiency in significant historic properties while maintaining building quality and the unique nature of historic districts.	
Goal 5: Enhance the quaint, tree-lined, and pedestrian-scale nature of existing neighborhoods.	**Policy 5.1:** Reduce residential electricity demands by promoting voluntary plantings of on-site shade trees that shade air-conditioned structures.	**Consistent:** The Tree Preservation section of the Resource Management Element includes various policies for the preservation and planting of new trees within the City. Applicable policies include: **Policies R10.1 through R11.2.**
	Policy 5.2: Reduce citywide electricity demands with nonresidential and municipal shade trees.	
	Policy 5.3: Reduce electricity demand by encouraging the installation of cool roofs on residential and nonresidential buildings.	

Table 5.6-7 Consistency with the City of Sierra Madre Energy Action Plan

EAP Goal	EAP Policies	Compliance with Goals
Goal 6: Integrate water-related energy conservation and efficiency practices in new and existing development.	**Policy 6.1:** Reduce per capita water demand by 30% by 2020 from 262 gallons per day to 183 gallons per day to conserve energy used to pump, treat, and convey water.	**Consistent:** The General Plan Update includes policies that range from requiring all new developments and substantial remodels to comply with all water conservation measures; incorporation of water conservation measures into the City's zoning code; consideration of water impact fees for new developments and additions; providing incentives for retrofitting existing structures with water saving fixtures; use of reclaimed water; and a restriction of hours of water usage for landscape and irrigation. Applicable policies include the following: **Policies L1.6, L4.3, L8.2, L8.3, L8.5, L15.4, L26.4, L41.2, R12.4, R15.1, R15.4, R17.1.**
Goal 7: Reduce municipal electricity use at City facilities 10 percent below baseline 2010 levels by 2020.	**Policy 7.1:** Model the benefits of cost-effective energy management practices.	**Consistent:** Policies under the Dark Sky section of the Resource Management Element would discourage continuous all-night exterior light fixtures and promote use of motion-sensored light systems in addition to having business turn off lights during off hours. Applicable policies include: **Policies R6.2, R7.1, R7.2, and R7.3.**
	Policy 7.2: Maximize the energy efficiency of existing building envelopes.	
	Policy 7.3: Identify long-term options to replace the City's heating, ventilation, and air conditioning (HVAC) equipment with models that yield lower operational costs.	
	Policy 7.4: Maximize the efficiency of equipment in City facilities to reduce maintenance and energy costs and support operational efficiencies.	
	Policy 7.5: Continue to monitor opportunities to reduce energy use for motors and pumps, including the water service facility.	
	Policy 7.6: Create a municipal financial system that supports energy efficiency.	
	Policy 7.7: Enhance outdoor lighting to maintain Sierra Madre's traditional village feel while reducing municipal maintenance and utility costs.	
	Policy 7.8: Work with the SGVCOG and regional partners for creation of a regional energy management position to track energy use at City facilities, identify opportunities for efficiencies and cost savings, and implement energy efficiency projects.	

Source: City of Sierra Madre Energy Action Plan (Sierra Madre 2012).

5.6.5 Existing Regulations

State

- California Global Warming Solutions Act (AB 32)
- Sustainable Communities and Climate Protection Act (SB 375)
- Greenhouse Gas Emission Reduction Targets (Executive Orders S-03-05 and B-30-15)
- Clean Car Standards – Pavley (AB 1493)
- Renewable Portfolio Standards (SB 1078)
- California Integrated Waste Management Act of 1989 (AB 939)
- California Mandatory Commercial Recycling Law (AB 341)
- California Advanced Clean Cars CARB (Title 13 CCR)
- Low-Emission Vehicle Program – LEV III (Title 13 CCR)
- Heavy-Duty Vehicle Greenhouse Gas Emissions Reduction Measure (Title 17 CCR)
- Low Carbon Fuel Standard (Title 17 CCR)
- California Water Conservation in Landscaping Act of 2006 (AB 1881)
- California Water Conservation Act of 2009 (SBX7-7)
- Statewide Retail Provider Emissions Performance Standards (SB 1368).
- Airborne Toxics Control Measure to Limit School Bus Idling and Idling at Schools (13 CCR 2480)
- Airborne Toxic Control Measure to Limit Diesel-Fuel Commercial Vehicle Idling (13 CCR 2485)
- In-Use Off-Road Diesel Idling Restriction (13 CCR 2449)
- Building Energy Efficiency Standards (Title 24, Part 6)
- California Green Building Code (Title 24, Part 11)
- Appliance Energy Efficiency Standards (Title 20)

5.6.6 Level of Significance Before Mitigation

Upon compliance with the regulatory requirements and implementation of the General Plan Update policies and Implementation Program measures, the following impact would be less than significant: 5.6-1.

Without mitigation, the following impacts would be **potentially significant**:

- **Impact 5.6-2** Growth of the City under the General Plan Update would not meet the GHG emissions reduction target of Executive Orders B-30-15 and S-03-05 without additional federal, state, and local GHG reduction measures and plans.

5.6.7 Mitigation Measures

Impact 5.6-2

6-1 The City of Sierra Madre shall incorporate the Energy Action Plan (EAP) policies into the General Plan Update to ensure that the City continues on a trajectory that aligns with the mid-term and long-term state GHG reduction goals of Executive Orders B-30-15 and S-03-05, respectively. The policies to be incorporated into the General Plan Update include, but are not limited to:

- Promote household energy conservation by residents in existing structures through education and outreach.
- Encourage residential upgrades to more energy-efficient, cost-saving appliances and equipment.
- Protect and preserve the City's mature housing stock by encouraging voluntary residential retrofits.
- Promote commercial energy conservation by business in existing structures through education and outreach.
- Support the use of energy-efficient appliances and equipment in leased and owner-occupied business.
- Preserve and enhance the downtown business core by facilitating retrofits and energy efficiency improvements within the nonresidential building stock.
- Encourage energy efficiency benchmarking as a tool to help businesses assess and identify opportunities to improve business energy performance.
- Maximize the energy efficiency of new buildings through a community-wide green building framework.
- Encourage the use of smart-grid-integrated and energy star appliances in new development.
- Encourage energy efficiency through development standards, permitting, and plan review processes.
- Enhance the City's historic preservation process to facilitate energy efficiency in significant historic properties while maintaining building quality and the unique nature of historic districts.
- Reduce residential electricity demands by promoting voluntary plantings of on-site shade trees that shade air-conditioned structures.

- Reduce citywide electricity demands with nonresidential and municipal shade trees.
- Reduce electricity demand by encouraging the installation of cool roofs on residential and nonresidential buildings.
- Reduce per capita water demand by 30% by 2020 from 262 gallons per day to 183 gallons per day to conserve energy used to pump, treat, and convey water.
- Model the benefits of cost-effective energy management practices.
- Maximize the energy efficiency of existing building envelopes.
- Identify long-term options to replace the City's heating, ventilation, and air conditioning (HVAC) equipment with models that yield lower operational costs.
- Maximize the efficiency of equipment in City facilities to reduce maintenance and energy costs and support operational efficiencies.
- Continue to monitor opportunities to reduce energy use for motors and pumps, including the water service facility.
- Create a municipal financial system that supports energy efficiency.
- Enhance outdoor lighting to maintain Sierra Madre's traditional village feel while reducing municipal maintenance and utility costs.
- Work with the SGVCOG and regional partners for creation of a regional energy management position to track energy use at City facilities, identify opportunities for efficiencies and cost savings, and implement energy efficiency projects.

5.6.8 Level of Significance After Mitigation

Impact 5.6-2

Mitigation Measure 6-1 would ensure that the City continues to implement actions that reduce GHG emissions from buildout of the General Plan Update. However, additional federal and state measures would be necessary to reduce GHG emissions to meet the mid-term and long-term GHG reduction goals under Executive Orders B-30-15 and S-03-05, which identified a mid-term goal to reduce GHG emissions to 40 percent of 1990 levels by 2030 and by 80 percent of 1990 levels by 2050. At this time, there is no plan past 2020 that achieves the mid-term and long-term GHG reduction goals established under B-30-15 and S-03-05, respectively. As identified by the California Council on Science and Technology, the state cannot meet the 2050 goal without major advancements in technology (CCST 2012). Since no additional federal or state measures are currently available that would ensure that the City of Sierra Madre could achieve an interim post-2020 target, Impact 5.6-2 would remain **significant and unavoidable**.

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5. Environmental Analysis
GREENHOUSE GAS EMISSIONS

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