4.12 GLOBAL CLIMATE CHANGE

4.13.1 ENVIRONMENTAL SETTING

IN THIS SECTION:

- Overview
- Greenhouse Gas Sources & Effects
- Regulatory Setting
- California Emissions Inventory & Scoping Plan
- City & Regional Plans & Targets

OVERVIEW

Climate change refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. Climate change may result from natural factors and processes, and human activities that change the composition of the atmosphere and alter the surface and features of the land. Such changes vary considerably by geographic location. Over time, the earth's climate has undergone periodic ice ages and warming periods, as observed in fossil isotopes, ice core samples, and through other measurement techniques. Recent climate change studies use the historical record to predict future climate variations and the level of fluctuation that might be considered statistically normal given historical trends. Significant changes in global climate patterns have recently been associated with global warming, an average increase in the temperature of the atmosphere near the Earth's surface, attributed to accumulation of greenhouse gas (GHG) emissions in the atmosphere (Office of Planning & Research, June 2008).

Greenhouse gases trap heat in the atmosphere, which in turn heats the surface of the Earth. Some GHGs occur naturally and are emitted to the atmosphere through natural processes, while others are created and emitted solely through human activities (Office of Planning & Research, June 2008). The greenhouse effect helps to regulate the temperature of the planet. It is essential for life on earth and is one of earth's natural processes. It is the result of heat absorption by certain gases in the atmosphere (called greenhouse gases because they effectively 'trap' heat in the lower atmosphere) and re-radiation downward of some of that heat. Water vapor is the most abundant greenhouse gas, followed by carbon dioxide and other trace gases (U.S. Department of Commerce, February 2010).

Natural processes and human activities such as fossil fuel combustion, deforestation and other changes in land use result in the emission of GHGs such as carbon dioxide (CO_2) in the atmosphere. Atmospheric concentrations of both the natural and man-made gases have been rising over the last few centuries. As the global population has increased with reliance on fossil fuels (such as coal, oil and natural gas), emissions of these gases have risen. The emission of GHGs through the combustion of fossil fuels in conjunction with other human activities, appears

to be closely associated with global warming (Office of Planning & Research, June 2008). Pre-industrial levels of carbon dioxide (prior to the start of the Industrial Revolution) were about 280 parts per million by volume (ppmv), and current levels are greater than 380 ppmv and increasing at a rate of 1.9 ppm yr^{-1} since 2000 (U.S. Department of Commerce, February 2010). The global concentration of CO_2 in the atmosphere today far exceeds the natural range over the last 650,000 years of 180 to 300 ppmv (Ibid.). According to the Intergovernmental Panel on Climate Change (IPCC – see description below), by the end of the 21st century, carbon dioxide concentrations could be anywhere from 490 to 1260 ppm (75-350% above the pre-industrial concentration) (Ibid.).

The IPCC modeled several possible emissions trajectories to determine what level of reductions would be needed worldwide to stabilize global temperatures and minimize climate change impacts. Regardless of the analytic method used, global average temperature and sea level rise were predicted to rise under all scenarios (IPCC, 2007). In other words, there is evidence that emissions reductions can minimize climate change effects but cannot reverse them entirely. Emissions reductions can reduce the severity of impacts, resulting in lesser environmental impacts. For example, the IPCC predicted that the range of global mean temperature change from year 1990 to 2100, given different emissions reductions scenarios, could range from 1.1° C to 6.4° C.

This section of the EIR evaluates the potential impacts of global climate change resulting from the proposed General Plan update. It is now widely recognized that anthropogenic (human-caused) emissions of greenhouse gases and aerosols are contributing to changes in the global climate, and that such changes are having, and will have adverse effects on the environment, the economy, and public health. These are cumulative effects of past, present, and future actions worldwide. While worldwide contributions of greenhouse gases are expected to have widespread consequences, it is not possible to link particular changes to the environment of California or elsewhere to greenhouse gases emitted a particular source or location. When considering a project's contribution to impacts from climate change, it is possible to examine the quantity of greenhouse gases that would be emitted either directly from project sources or indirectly from other sources, such as production of electricity. However, that quantity cannot be tied to a particular adverse effect on the environment of California or elsewhere associated with climate change.

California's State's top scientists consider global warming to be a very serious issue requiring changes in resource, water supply, and public health management (California Climate Change Center, July 2006). In 2006, the State of California passed the Global Warming Solutions Act of 2006 (AB 32), which seeks to reduce GHG emission generated by California. AB 32 (which is further described below) states:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

GREENHOUSE GAS SOURCES & EFFECTS

Greenhouse Gases

The California Global Warming Solutions Act of 2006 includes the following Kyoto greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). These greenhouse gases are referenced in the international guidance on the development of national inventories provided by the IPCC, the authoritative scientific body on climate change (California Air Resources Board, November 2007). Three of these greenhouse gases, CO_2, CH_4, and N_2O, may be emitted naturally or through human activities (e.g., the combustion of fossil fuels). The other three, SF_6, HFCs, and PFCs, are synthetically produced for industrial purposes (Ibid.).

The most common GHG that results from human activity is carbon dioxide, followed by methane and nitrous oxide (California Governor's Office of Planning and Research, June 2008). The primary contributors to GHG emissions in California (as of 2008) are transportation (about 37%), electric power production (24%), industry (20%), agriculture and forestry (6%), and other sources, including commercial and residential uses (13%) (California Air Resources Board, November 2007). Approximately 81% of California's emissions are carbon dioxide produced from fossil fuel combustion (California Air Resources Board, September 2010).

Further descriptions of greenhouse gases are provided below.

- *Carbon Dioxide (CO_2)*. The natural production and absorption of carbon dioxide (CO_2) is achieved through the terrestrial biosphere (through uptake by vegetation) and dissolution into the ocean. "CO_2 sinks" absorb, rather than produce, CO_2. Emissions related to human activity are mainly associated with carbon-bearing fossil fuel combustion with a portion of these emissions attributed to out-of-state fossil fuel used for electricity consumption within California (California Energy Commission, December 2006). Other activities that produce CO2 emissions include mineral production, waste combustion, and land use and forestry changes (Ibid.).
- *Methane (CH_4)*. Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane come from landfills, natural gas systems, and enteric fermentation. Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. Agricultural activities (enteric fermentation and manure management) and landfills are the major sources of these emissions (California Energy Commission, December 2006).
- *Nitrous Oxide (N_2O)*. Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. Agricultural soil management activities and mobile source fuel combustion compose the major sources of N_2O emissions in California (California Energy Commission, December 2006).

- *Hydrofluorocarbons (HFCs)*. HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum.
- *Perfluorocarbons (PFCs)*. Perfluorocarbons are compounds consisting of carbon and fluorine. They are primarily created as a byproduct of aluminum production and semi-conductor manufacturing.
- *Sulfur hexafluoride (SF_6)*. Sulfur hexafluoride is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity.

Effects of GHG Emissions & Climate Change

Greenhouse gases are global in their effect. A primary element of global climate change has been a rise in average temperatures. According to the IPCC, "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level" (Intergovernmental Panel on Climate Change, 2007). At continental, regional and ocean basin scales, numerous long-term changes in climate have been observed to include: changes in arctic temperatures and ice, widespread changes in precipitation amounts, ocean salinity, wind patterns and aspects of extreme weather including droughts, heavy precipitation, heat waves and the intensity of tropical cyclones (Ibid.) Furthermore, most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations, and warming of about 0.2°C per decade is projected for the next two decades (Ibid.).

Climate change models predict changes in temperature, precipitation patterns, water availability, and rising sea levels, and these altered coastal conditions can have impacts on natural and human systems in California (California Climate Action Team, April 2010). Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The state has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year (California Natural Resources Agency, 2009). Changes in temperature, precipitation, and sea levels can affect California's public health, habitats, ocean and coastal resources, water supplies, agriculture, forestry, and energy use (California Climate Action Team, April 2010), as well as result in increased droughts and flooding.

According to the California Department of Water Resources ("California Water Plan Highlights"), more changes related to climate change can be expected by the year 2050 and on to the end of the century:

- California's mean temperature may rise 1.5 degrees to 5.0 degrees Fahrenheit by 2050 and 3.5 degrees to 11 degrees by the end of the century.
- Sierra Nevada snowpack may decrease by 25 to 40%.

- Average annual precipitation may show little change, but more intense wet and dry periods can be expected with more floods and more droughts,
- Flood peaks will become higher and natural spring/summer runoff will become lower.
- Global sea levels may rise by 4 to 16 inches by mid-century and 7 to 55 inches by the end of the century, which would increase salinity in California's delta region (California Department of Water Resources, 2009).

According to the California Climate Change Center:

- Sea level in California could rise between approximately10 centimeters to 90 centimeters (4 to 25 inches) above existing mean sea level by 2099 as a result of climate change, also increasing the frequency of 100-year event high tide peaks (California Climate Change Center, March 2006).
- A subsequent study indicated that under medium to medium-high greenhouse-gas emissions scenarios, mean sea level along the California coast is projected to rise from 1.0 to 1.4 meters (about 3 to 4.5 feet) by the year 2100 (California Climate Change Center, March 2009).

Climate change could also have adverse effects on water quality, which would in turn affect the beneficial uses (habitat, water supply, etc.) of surface water bodies and groundwater. Changes in precipitation could result in increased sedimentation, higher concentrations of pollutants, higher dissolved oxygen levels, increased temperatures, and an increase in the amount of runoff constituents reaching surface water bodies.

Climate change is also expected to have effects on diverse types of ecosystems, from alpine to deep sea habitat. As temperatures and precipitation change, seasonal shifts in vegetation will occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The IPCC states that "20 percent to 30 percent of species assessed may be at risk of extinction from climate change impacts within this century if global mean temperatures exceed 2 to 3˚C (3.6 to 5.4˚F) relative to pre-industrial levels." Shifts in existing biomes could also make ecosystems vulnerable to invasive species encroachment. Wildfires, which are an important control mechanism in many ecosystems, may become more severe and more frequent, making it difficult for native plant species to repeatedly re-germinate. In general terms, climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity.

Finally, climate change may also increase the risk of vector-borne infectious diseases, particularly those found in tropical areas and spread by insects – malaria, dengue fever, yellow fever, and encephalitis. Cholera, which is associated with algal blooms, could also increase. While these health impacts would largely affect tropical areas in other parts of the world, effects would also be felt in California. Warming of the atmosphere would be expected to increase smog and particulate pollution, which could adversely affect individuals with heart and respiratory problems, such as asthma. Extreme heat events would also be expected to occur with more frequency, and could adversely affect the elderly, children and the homeless.

Lastly, the water supply impacts and seasonal temperature variations expected as a result of climate change could affect the viability of existing agricultural operations, making the food supply more vulnerable.

REGULATORY SETTING

International Efforts

KYOTO PROTOCOL

Over a decade ago, most countries joined an international treaty – the United Nations Framework Convention on Climate Change (UNFCCC) – to consider what can be done to reduce global warming and to cope with whatever temperature increases are inevitable. A number of nations approved an addition to the treaty: the Kyoto Protocol; the goal of the Protocol is to achieve overall emissions reduction targets for six greenhouse gases by the period of 2008 to 2012. The six greenhouse gases regulated under the Protocol are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons. Each nation has an emissions reduction target for which they must reduce greenhouse gas emissions a certain percentage below 1990 levels; the average reduction target for nations participating in the Kyoto Protocol is approximately 5% below 1990 levels (Ibid.). To date, 192 parties have ratified the treaty (Ibid.); the United States has not ratified the Protocol (from the UNFCCC website; online at: http://unfccc.int/essential_background/items/2877.php).

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is the leading body for the assessment of climate change, established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO), to provide the world with a clear scientific view on the current state of climate change and its potential environmental and socio-economic consequences. The IPCC is a scientific body; its main activity is to provide "Assessment Reports" at regular intervals of the state of knowledge on climate change. It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change, but does not conduct research or monitor climate-related data. Thousands of scientists from all over the world contribute to the work of the IPCC on a voluntary basis. The IPCC also produces special reports and technical papers. Review is an essential part of the IPCC process, to ensure an objective and complete assessment of current information. The IPCC seeks to reflect a range of views and expertise (Intergovernmental Panel on Climate Change website, "Organization" page).

The IPCC developed the Global Warming Potential (GWP) concept to compare the ability of each greenhouse gas to trap heat in the atmosphere relative to another gas. The reference gas used is CO_2, and GWP weighted emissions are measured in teragrams (or million metric tons) of CO_2 equivalent (Tg CO_2 Eq.) (U.S. EPA, February 2011). A million metric tons of CO_2 equivalent also is referenced as $MMTCO_2E$.

ICLEI – LOCAL GOVERNMENTS FOR SUSTAINABILITY

ICLEI – Local Governments for Sustainability – is an international organization that assists local governments in reaching their goals of sustainability and climate change mitigation. ICLEI was founded in 1990 as the International Council for Local Environmental Initiatives[1], when more than 200 local governments from 43 countries convened at the inaugural World Congress of Local Governments for a Sustainable Future at the United Nations in New York City. ICLEI is currently a membership association of over 1,200 local governments and their associations from over 70 countries that are committed to sustainable development. ICLEI works with hundreds of local governments through international performance-based, results-oriented campaigns and programs. ICLEI's mission is to build and serve a worldwide movement of local governments to achieve tangible improvements in global sustainability with special focus on environmental conditions through cumulative local actions. The organization provides technical consulting, training and information services to share knowledge and support local governments in the implementation of sustainable development at the local level (ICLEI website).

Federal Programs

The U.S. Environmental Protection Agency (EPA) is responsible for implementing federal policy to address global climate change. The federal government administers a wide array of public-private partnerships to reduce GHG intensity generated by the United States. These programs focus on energy efficiency, renewable energy, methane and other non-CO_2 gases, agricultural practices, and implementation of technologies to achieve GHG reductions. EPA prepares an annual emissions inventory that identifies and quantifies the country's primary anthropogenic[2] sources and sinks of greenhouse gases, in part, as a signatory in 1992 to the United Nations Framework Convention on Climate Change (UNFCCC). Pursuant to the UNFCCC, ratifying parties "shall develop, periodically update, publish and make available…national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases" (U.S. EPA, February 2011). The current inventory presents estimates of U.S. greenhouse gas emissions and sinks for the years 1990 through 2008.

In February 2002, the United States government announced a strategy to reduce the GHG intensity of the American economy by 18 percent over the 10-year period from 2002 to 2012. GHG intensity measures the ratio of GHG emissions to economic output. Meeting this commitment will prevent the release of more than 100 million metric tons of CO_2e emissions to the atmosphere (annually) by 2012 and more than 500 million metric tons (cumulatively) between 2002 and 2012. This policy has three basic objectives: slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation.

[1] In 2003, ICLEI's Members voted to revise the organization's mission, charter and name to better reflect the current challenges local governments are facing. The International Council for Local Environmental Initiatives became ICLEI - Local Governments for Sustainability with a broader mandate to address sustainability issues (ICLEI website at: http://www.iclei.org/index.php?id=about).

[2] The term "anthropogenic" refers to greenhouse gas emissions and removals that are a direct result of human activities or are the result of natural processes that have been affected by human activities.

In *Massachusetts v. Environmental Protection Agency,* decided in 2007, the U.S. Supreme Court held that the EPA has authority to regulate greenhouse gases, and the EPA's reasons for not regulating this area did not fit the statutory requirements. As such, the U.S. Supreme Court ruled that the EPA should be required to regulate CO_2 and other greenhouse gases as pollutants under Section 202(a)(1) of the federal Clean Air Act (CAA).

In December 2010, the U.S. EPA issued its plan for establishing greenhouse gas (GHG) pollution standards under the Clean Air Act in 2011. The agency looked at a number of sectors and is moving forward on GHG standards for fossil fuel power plants and petroleum refineries—two of the largest industrial sources, representing nearly 40% of the GHG pollution in the United States (U.S. EPA, Press Release, 12/23/10).

State Regulations and Programs

California's first statute on climate change was enacted in 1988 when the state legislature ordered a report on the impacts of climate change and recommendations to avoid, reduce, and address them. In 2002 the state led the United States by becoming the first jurisdiction to require standards for greenhouse gas emissions from cars. In 2004, Senate Bill 1107 directed the Secretary of Environmental Protection to coordinate all climate change activities in the state. The Secretary chairs the Climate Action Team, which is made up of agency secretaries and department directors from throughout state government. With the passage of California Global Warming Solutions Act of 2006, also known as Assembly Bill (AB) 32, California became the first state to set a binding, economy-wide target for greenhouse gas emissions (California Climate Action Team, December 2010).

California's climate programs include the following primary initiatives, which are coordinated by the Climate Action Team, under the leadership of the Secretary for Environmental Protection:

- Research: State-specific research supports our understanding of the impacts of climate change in California and informs policymaking.
- Mitigation: The California Global Warming Solutions Act of 2006 establishes a limit on state greenhouse gas emissions in 2020, and recognizes the importance of substantial emission reductions by 2050. The state has a comprehensive set of policies and programs to cost effectively reduce emissions, while advancing new clean energy industries and green jobs.
- Adaptation: The state Adaptation Strategy is designed to reduce California's vulnerability to climate impacts and enhance the resiliency of the state's communities, infrastructure, resources, and people.
- Joint Action: California is leveraging its efforts through regional and international initiatives to expand emission reduction programs and to enable effective adaptation (California Climate Action Team, December 2010).

Key laws and programs are further described below.

ASSEMBLY BILL 1493 – GHG EMISSION STANDARDS FOR AUTOMOBILES (2002)

Assembly Bill 1493 (Pavley, Chapter 200, Statutes of 2002), enacted on July 22, 2002 by the State Legislature (amending Health & Safety Code, § 42823 and adding Health & Safety

Code, § 43018.5), required the California Air Resources Board (CARB) to set greenhouse gas emission standards for passenger vehicles, light duty trucks, and other vehicles determined to be vehicles whose primary use is noncommercial personal transportation in the State manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004, which phase in during the 2009 through 2016 model years. Compared to the 2002 fleet, the standards will result in an approximate 30% reduction in GHG emissions by 2016 (California Environmental Protection Agency, December 2010).

EXECUTIVE ORDER S-3-05(2005)

In June 2005, Governor Schwarzenegger established California's greenhouse gas emissions reduction targets in Executive Order S-3-05, which established the following goals:

- Greenhouse gas emissions should be reduced to 2000 levels by 2010;
- Greenhouse gas emissions should be reduced to 1990 levels by 2020; and
- Greenhouse gas emissions should be reduced to 80 percent below 1990 levels by 2050.

The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various state agencies in order to collectively and efficiently reduce greenhouse gases. A biannual progress report must be submitted to the Governor and State Legislature disclosing the progress made toward greenhouse gas emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, the coastline and forestry and report possible mitigation and adaptation plans to combat these impacts.

The Secretary of CalEPA leads this Climate Action Team (CAT) made up of representatives from state agencies as well as numerous other Boards and Departments. The CAT members work to coordinate statewide efforts to implement global warming emission reduction programs and the state's Climate Adaptation Strategy. The CAT is also responsible for reporting on the progress made toward meeting the statewide greenhouse gas (GHG) targets that were established in the executive order and further defined under the Global Warming Solutions Act of 2006 (Assembly Bill 32). The first Climate Action Team Report to the Governor and the Legislature was released in March 2006, in which it laid out 46 specific emission reduction strategies for reducing GHG emissions and reaching the targets established in the Executive Order. The Climate Action Team Report to the Governor and Legislature will be updated and issued every two years thereafter; the most recent was released in December 2010.

ASSEMBLY BILL 32 – CALIFORNIA GLOBAL WARMING SOLUTIONS ACT (2006)

The State's Legislature enacted Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006 to further the goals of Executive Order S-3-05. (See Stats. 2006, ch. 488, enacting Health & Safety Code, §§ 38500–38599.) The Governor's Executive Order S-3-05 and AB 32 (Health & Safety Code, § 38501 et seq.) both seek to achieve 1990 emissions levels by the year 2020. Executive Order S-3-05 further requires that California's GHG emissions be 80 percent below 1990 levels by the year 2050. AB 32 defines GHGs to include the following, which are also addressed in the international Kyoto Protocol: carbon dioxide, methane, nitrous oxide, hydrocarbons, perfluorocarbons and sulfur hexafluoride.

The California Air Resources Board (CARB) has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. The foremost objective of CARB is to adopt regulations that require the reporting and verification of statewide greenhouse gas emissions and achieve GHG emissions equivalent to statewide levels of 1990 by 202 through an enforceable statewide emission cap, which will be phased in starting in the year 2012. Emissions reductions shall include carbon sequestration projects (projects that would remove carbon from the atmosphere), and best management practices that are technologically feasible and cost effective. AB 32 allows CARB to adopt market based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market based compliance mechanism adopted.

EXECUTIVE ORDER S-1-07(2007)

On January 18, 2007, California further solidified its dedication to reducing greenhouse gases by setting a new Low Carbon Fuel Standard for transportation fuels sold within the State. Executive Order S-1-07 sets a declining standard for greenhouse gas emissions measured in carbon dioxide equivalent gram per unit of fuel energy sold in California. The target of the Low Carbon Fuel Standard is to reduce the carbon intensity of California passenger vehicle fuels by at least 10% by 2020. The Low Carbon Fuel Standard 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. The Low Carbon Fuel Standard was approved by the CARB in April 2009 (California Climate Action Team, December 2010).

SENATE BILL 97 (2007) AND RELEVANT GUIDANCE

Senate Bill 97, enacted in 2007, amended the CEQA statute to clearly establish that GHG emissions and effects of GHG emissions are subject to CEQA. It also directed OPR to prepare, develop and transmit draft CEQA Guidelines to address GHG emissions to the Natural Resources Agency to certify and adopt these guidelines by January 1, 2010. The Natural Resources Agency adopted the amendments in January 2010, which went into effect in March 2010. The amendments do not identify a threshold of significance for GHG emission, nor do they prescribe assessment methodologies or specific mitigation measures. The amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion granted by CEQA to lead agencies in making their own determinations based on substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

While the state has not yet adopted any formal significance thresholds, OPR did issue a guidance document on June 19, 2008, to provide interim advice to lead agencies regarding the analysis of GHG emissions in environmental documents. The technical advisory suggests three components for CEQA disclosure: quantification of GHG emissions from a project's construction and operation, determination of significance of the project's impact to climate change, and if the project is found to be significant, the identification of suitable alternatives and mitigation measures. The analysis contained herein follows this guidance.

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) released a white paper, entitled CEQA and Climate Change. The white paper contains the disclaimer that it is "intended as a resource, not a guidance document," and examines various threshold approaches available to air districts and lead agencies for determining whether GHG emissions are significant.

SENATE BILL 375- SUSTAINABLE COMMUNITIES & CLIMATE PROTECTION ACT OF 2008

Senate Bill 375 (SB 375), signed in 2008 (Chapter 728, Statutes of 2008), builds upon the principles set forth in AB 32 and provides a means for addressing climate change in CEQA documents. SB 375 aims to reduce greenhouse gas emissions by aligning regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation, thereby discouraging urban sprawl and reducing vehicle miles traveled. Among other things, SB 375 requires metropolitan planning organizations (MPOs), such as the Association of Monterey Bay Area Governments (AMBAG), to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS), as defined, in their upcoming, updated regional transportation plans (RTPs) to meet greenhouse gas reduction targets. SB 375 also aligns planning for transportation and housing, and creates specified incentives for smart growth development, in the form of streamlined review under CEQA for certain projects consistent with the SCS: transit priority projects (projects comprising at least 50% residential use, a residential density of at least 20 units per net acre and located within one half mile of a regional transit corridor) and residential or mixed use projects with a residential component requiring at least 75% of the total square footage.

SB 375 also details specific roles for MPOs and air districts in the setting GHG emissions targets for the region. ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects will not be eligible for funding programmed after January 1, 2012.

The law also extends the minimum time period for the regional housing needs allocation cycle from five years to eight years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

EXECUTIVE ORDER S-13-08 (2008)

Executive Order S-13-08 launched a major initiative for improving the state's adaptation to climate impacts from sea level rise, increased temperatures, shifting precipitation, and extreme weather events. It ordered a California Sea Level Rise Assessment Report to be requested from the National Academy of Sciences. It also ordered the development of a Climate Adaptation Strategy. The strategy, published in December 2009, assesses the state's vulnerability to

climate change impacts, and outlines possible solutions that can be implemented within and across state agencies to promote resiliency. The Strategy focused on seven areas: public health, biodiversity and habitat, ocean and coastal resources, water management, agriculture, forestry, and transportation and energy infrastructure (California Climate Action Team, December 2010).

Local Programs

CITY OF SANTA CRUZ

The City of Santa Cruz has been a member of ICLEI since 2001, and is one of over 400 U.S. members of the Cities for Climate Protection (CCP) campaign. The CCP campaign provides a framework for local communities to identify and reduce GHG emissions.

The City has been developing emissions strategies to reduce greenhouse gas (GHG) emissions to 1990 levels. In 2006, the Santa Cruz City Council adopted the Santa Cruz Climate Action Declaration, which established the City's commitment to respond to global climate change and now serves as the guiding framework for the City's climate protection programs. In June 2007, the City Council conditionally accepted a set of General Plan goals and policies on climate change, including reducing community-wide greenhouse gas emissions 30% by 2020 and 80% by 2050 (compared to 1990 levels), and for all new buildings to be emissions-neutral by 2030. In 2007, the City's Climate Action Program also was established to create and implement a comprehensive plan to meet the City's community-wide greenhouse gas reduction goals. In August 2008, the City completed an Emissions Inventory, which provides information regarding municipal and community-wide emissions, and was updated in 2010. The City also completed a draft "Climate Action Plan" (CAP) in October 2010, but it has not yet been adopted. It is expected that a revised draft will be released in the fall of 2011.

CLIMATE ACTION COMPACT

In October 2007, the County of Santa Cruz, the City of Santa Cruz and the University of California Santa Cruz partnered to create a *Climate Action Compact (CAC)*. The goal of the CAC is to achieve meaningful and measurable progress towards lowering local greenhouse gas emissions through the implementation of cooperative programs. To that end, the CAC partners initiated a process to develop actions necessary to accomplish the goals outlined in the compact. The members pledged to support public, private and nonprofit partnerships and investments to reach quantifiable reductions in their institutions' GHG emissions (City of Santa Cruz, February 2010). In taking this leadership role, the Climate Action Compact partners pledged themselves to the following:

- Set and present a greenhouse gas (GHG) reduction goal for their organization;
- Identify specific inter-institutional cooperative projects that reduce GHG emissions, stimulate investment in the community and foster economic development;
- Present a comprehensive GHG reduction action plan for their organization; and
- Immediately invite others from the public, private, and non-profit sectors in the region to join in the effort. (City of Santa Cruz, "Climate Action Compact" website).

ASSOCIATION OF MONTEREY BAY AREA GOVERNMENTS (AMBAG)

AMBAG has developed regional emission targets in accordance with requirements of Senate Bill 375. In collaboration with Pacific Gas and Electric Company, AMBAG is also working with local governments to promote energy efficiency and climate action planning. This collaboration has included preparation of GHG emissions inventories.

CALIFORNIA EMISSIONS INVENTORY & SCOPING PLAN

Global and National GHG Emissions Background

California is the fifteenth largest emitter of greenhouse gases on the planet, representing about two percent of the worldwide GHG emissions (California Air Resources Board, December 2008). Anthropogenic GHG emissions worldwide as of 2005 totaled approximately 44,153 CO_2 equivalent million metric tons (MMT CO_2e) (World Resources Institute, July 2009). In 2009, total U.S. greenhouse gas emissions were 6,639.7 Tg CO_2 Eq (U.S. EPA, February 2011). While total U.S. emissions have increased by 7.4% from 1990 to 2009, emissions decreased from 2008 to 2009 by 6% primarily due to a decrease in economic output and energy consumption across all sectors and a decrease in the carbon intensity of fuels used to generate electricity as the price of coal increased and the price of natural gas decreased significantly (Ibid.). Since 1990, U.S. emissions have increased at an average annual rate of 0.4% (Ibid.).

California Emissions Inventory & Reduction Targets

The California Air Resources Board (CARB) is the lead agency for implementing AB 32. The CARB identified 36 "early actions to mitigate climate change in California" in April 2007 as required by AB 32. These actions relate to low carbon and other fuel standards, improved methane capture at landfills, agricultural measures, reduction of hydrocarbons and perfluorocarbons from specified industries, energy efficiency, and a variety of transportation-related actions. As previously indicated, the transportation sector contributes nearly 39% of California's gross GHG emissions, and is the largest contributor of GHG emissions in the State of California.

EMISSIONS INVENTORY

In accordance with provisions of AB 32, CARB[3] completed a statewide Greenhouse Gas (GHG) Inventory that provides estimates of the amount of GHGs emitted to, and removed from, the atmosphere by human activities within California. The inventory includes estimates for carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons and perfluorocarbons. The emissions inventory covers seven sectors: transportation, electricity generation, industrial, residential, agriculture, commercial and forestry. The initial GHG Inventory covered the years 1990 to 2004. CARB recently updated the GHG emissions inventory to include the years 2005 through 2008 (California Air Resources Board, September 2010).

[3] In January 2007, AB 1803 transferred responsibility for developing and maintaining the state's greenhouse gas inventory from the California Energy Commission (CEC) to the CARB, which used the CEC GHG inventory as a starting point to develop 1990 GHG emissions.

In December 2007, CARB approved a greenhouse gas emissions target of 427 $MMTCO_2E$, which is equivalent to the state's calculated GHG emissions level in 1990 (California Air Resources Board, December 2008). The 2020 target requires the reduction of 169 $MMTCO_2E$ or approximately 30% from the state's projected 2020 emissions estimate of 596 $MMTCO_2E$ (business as usual) (Ibid.).

A review of statewide GHG emissions trends by the CARB indicates that 2008 saw a small decrease in statewide GHG emissions, driven by a noticeable drop in on-road transportation emissions and the beginning of the economic recession and fuel price spikes. California's gross emissions of greenhouse gas increased 4.3% from 458 $MMTCO_2E$ in 2000 to 477.7 million in 2008, with a maximum of 483.9 million in 2004. During the same period, California's population grew by 11.8% from 34.1 to 38.1 million people, and GHG emissions per person decreased from 13.4 to 12.5 metric tonnes of CO_2e per person (California Air Resources Board, May 2010).

CALIFORNIA CLIMATE CHANGE SCOPING PLAN

In accordance with requirements of AB 32, a Scoping Plan was released in October 2008 and adopted by CARB in December 2008. The Plan includes programs and measures t to reach the total emissions reduction of 173 million tons by the year 2020. Key elements for reducing the state's greenhouse emissions to 1990 levels by 2020 include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related greenhouse gas emissions for regions throughout California, and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation (California Air Resources Board, October 2008).

The Scoping Plan contains the main strategies California will implement to reduce CO_2e emissions by 169 MMT., The Scoping Plan identifies 18 emissions reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional transportation-related greenhouse gas targets, vehicle efficiency measures, goods movement, solar roofs program, industrial emissions, high speed rail, green building strategy, recycling, sustainable forests, water and air (California Air Resources Board, December 2008).

The measures would result in a total reduction of 174 $MMTCO_2E$ by 2020 (Ibid.). Table 4.12-1 summarizes the Scoping Plan measures and estimated emissions reductions. The Scoping Plan breaks down the amount of GHG emissions reductions ARB recommends for each emissions sector of the state's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMT CO2e),
- The Low-Carbon Fuel Standard (15.0 MMT CO2d),
- Energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO2e), and
- A renewable portfolio standard for electricity production (21.3 MMT CO2e).

The Scoping Plan identifies the role of local governments with the following language:

> "Local Government Targets: In recognition of the critical role local governments will play in the successful implementation of AB 32, ARB added a section describing this role. In addition, ARB recommended a greenhouse gas reduction goal for local governments of 15 percent below today's levels by 2020 to ensure that their municipal and community-wide emissions match the State's reduction target."

Final CARB regulations are not due until January 1, 2011, and will not be operative until January 1, 2012. By the former date, CARB must adopt "greenhouse gas emissions limits and emissions reductions measures … to achieve the maximum technologically feasible and cost-effective reductions in greenhouse gas emissions in furtherance of achieving the statewide greenhouse gas emissions limit[.]" (Health & Safety Code, § 38562(a).)

On March 18, 2011, Judge Ernest Goldsmith of the San Francisco Superior Court issued a ruling in a case brought by a citizens group against the ARB, challenging the agency's CEQA compliance for the approval of the cap and trade component of ARB's Scoping Plan. [*Association of Irritated Residents et al v. California Air Resources Board*, San Francisco Superior Court Case No. CPF-09-509562.] The court found substantive and procedural flaws in how ARB's CEQA compliance and enjoined ARB from any further implementation of the measures contained in the Scoping Plan, including the cap and trade program scheduled to go into effect on January 1, 2012 until after ARB "comes into complete compliance with its obligations" under CEQA. Specifically, the court found that ARB violated CEQA by failing to fully evaluate possible alternatives to the measures described in the Scoping Plan. The decision criticized the Scoping Plan CEQA analysis for failing to specifically discuss in detail a carbon fee alternative to cap and trade.

The ARB appealed the superior court's ruling, and the Court of Appeal for the First Appellate District issued an order on June 3, 2011, temporarily staying the enforcement of the superior court's writ of mandate, giving the parties some time to further brief the issues. (Court of Appeal Case No. A132165.) On August 25, 2011, the ARB adopted a revised environmental analysis while still affirming its original decision. The original plaintiffs asserted at the ARB's August 25, 2011, hearing that the revised analysis still failed to adequately consider other options. At the time of publication of this EIR, it was uncertain what effect this litigation

ultimately would have on ARB's implementation of its Scoping Plan, but at a minimum, it seems likely to slow California's efforts to adopt a cap and trade program. Originally scheduled for implementation next year, industry compliance with the cap-and-trade program will now take effect in 2013. (Online at: http://www.latimes.com/news/local/la-me-cap-trade-20110825,0,1958108,print.story.)

CITY & REGIONAL PLANS AND TARGETS

City of Santa Cruz

CITY OF SANTA CRUZ EMISSIONS INVENTORY

In August 2008, the City completed an Emissions Inventory, which provides information regarding municipal and community emissions. The inventory was updated in 2010 and includes emissions inventories for the years 1996, 2005 and 2008. Emissions levels have been quantified for each community sector (business, residential, municipal, and transportation) and by fuel source (natural gas, electricity, petroleum, other).

According to the City's emissions inventory, the City emitted 384,427 metric tons of carbon dioxide (CO_2e) in 1996 with an effective baseline inventory of 312,508 metric tons[4] (City of Santa Cruz, February 2010). The community of Santa Cruz has reduced annual GHG emissions below baseline levels by approximately 8% between 1996 and 2008 (City of Santa Cruz, September 2010). Most notably, residential home emissions have dropped 22% since 1996 (Ibid.). Recent updates provided by City staff indicate that the baseline year 1996 emissions estimates are 427,280 metric tons per year (Clark, City of Santa Cruz, personal communication, July 2011).

AMBAG also completed an emissions inventory for the City in early 2011 that developed a higher estimate for transportation and landfill (methane emissions) than the City's inventory and also includes UCSC. The City's emission inventory was updated by City staff during preparation of this EIR, concurrent with preparation of the City's draft "Climate Action Plan." The City's numbers differ from AMBAG's, as the City's numbers do not include UCSC and landfill emissions. City staff indicates that in 2008, City emissions totaled 351,321 metric tons (Clark, City of Santa Cruz, personal communication, August 2011) as summarized in Table 4.12-2.

[4] One metric ton = 2,204.62262 pounds.

TABLE 4.12.1
State Scoping Plan Recommended Greenhouse Gas Reduction Measures

Recommended Reduction Measures	Reductions Counted Towards 2020 Target ($MMTCO_2E$)	
ESTIMATED REDUCTIONS RESULTING FROM THE COMBINATION OF CAP-AND-TRADE PROGRAM AND COMPLEMENTARY MEASURES		**146.7**
California Light-Duty Vehicle Greenhouse Gas Standards • Implement Pavley standards • Develop Pavley II light-duty vehicle standards	31.7	
Energy Efficiency • Building/appliance efficiency, new programs, etc. • Increase CHP generation by 30,000 GWh • Solar Water Heating (AB 1470 goal)	26.3	
Renewables Portfolio Standard (33% by 2020)	21.3	
Low Carbon Fuel Standard	15	
Regional Transportation-Related GHG Targets[16]	5	
Vehicle Efficiency Measures	4.5	
Goods Movement • Ship Electrification at Ports • System-Wide Efficiency Improvements	3.7	
Million Solar Roofs	2.1	
Medium/Heavy Duty Vehicles • Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency) • Medium- and Heavy-Duty Vehicle Hybridization	1.4	
High Speed Rail	1.0	
Industrial Measures (for sources covered under cap-and-trade program) • Refinery Measures • Energy Efficiency & Co-Benefits Audits	0.3	
Additional Reductions Necessary to Achieve the Cap	34.4	
ESTIMATED REDUCTIONS FROM UNCAPPED SOURCES/SECTORS		**27.3**
High Global Warming Potential Gas Measures	20.2	
Sustainable Forests	5.0	
Industrial Measures (for sources not covered under cap and trade program) • Oil and Gas Extraction and Transmission	1.1	
Recycling and Waste (landfill methane capture)	1.0	
TOTAL REDUCTIONS COUNTED TOWARDS 2020 TARGET		**174**
Other Recommended Measures	**Estimated 2020 Reductions ($MMTCO_2E$)**	
State Government Operations	1-2	
Local Government Operations	TBD	
Green Buildings	26	
Recycling and Waste • Mandatory Commercial Recycling • Other measures	9	
Water Sector Measures	4.8	
Methane Capture at Large Dairies	1.0	

[16] This number represents an estimate of what may be achieved from local land use changes. It is not the SB 375 regional target. ARB will establish regional targets for each Metropolitan Planning Organization (MPO) region following the input of the Regional Targets Advisory Committee and a public consultation process with MPOs and other stakeholders per SB 375.

Source: California Air Resources Board, December 2008 (*Scoping Plan*, Table 2).

DRAFT CLIMATE ACTION PLAN

A draft "Climate Action Plan" (CAP) for the City of Santa Cruz was completed in September 2010, and a revised draft is expected to be released in the fall of 2011. A baseline greenhouse gas emissions inventory is presented for 1996, which sets the initial levels of emissions from which all reduction goals will be based. Although the international and state standard for a baseline inventory is 1990[5], the City of Santa Cruz did not have enough historical data for that year. Therefore, the City has set reduction goals of 30% below 1996 levels by 2020, and 80% below by 2050; State and county emissions data suggest that emissions between 1990 and 1996 were similar (City of Santa Cruz, September 2010). Furthermore, the baseline inventory was further reduced for the commercial/industrial sector due to closures of significant businesses in the area after 1996 and a corresponding reduction in GHG emissions as a result.

The draft CAP is written to achieve the draft General Plan goals to reduce community-wide greenhouse gas emissions 30% by 2020 and 80% by 2050 (compared to 1990 levels), and for all new buildings to be emissions-neutral by 2030. The draft CAP available at the time this EIR was prepared calls for a reduction of approximately 65,640 metric tons of GHG emissions between 2008 and 2020, which represents an approximate 24% reduction over 2008 levels (City of Santa Cruz, September 2010). The Draft CAP identifies strategies to reduce emissions related to following sectors: energy, transportation and land use, water conservation and wastewater management, and locally generated renewable energy. The City of Santa Cruz Climate Reduction Strategy is based on three key activities: expansion of energy efficiency and conservation efforts; identification and selection of more sustainable products and services; and increased investment in local renewable energy.

TABLE 4.12-2
City Of Santa Cruz REVISED 2008 GHG Emissions

Sector	TOTAL
Residential	76,805
Commercial/Industrial	93,304
Transportation	160,762
Municipal	10,261
Waste	10,189
TOTAL	**351,321**

In metric tons CO_2e
Source: City of Santa Cruz Climate Action Program

[5] The year 1990 was set as a worldwide baseline for greenhouse gas emissions and codified in policy by the Kyoto Protocol of 1997. The State of California also set reduction goals based on 1990 levels (AB32) and has quantified state wide emissions for 1990 (City of Santa Cruz, September 2010).

Association of Monterey Bay Area Governments (AMBAG)

EMISSIONS INVENTORY FOR CITY OF SANTA CRUZ

The AMBAG Energy Watch completed a GHG emissions inventory for the City of Santa Cruz for the year 2005. The AMBAG Energy Watch program is a local government partnership between AMBAG and the Pacific Gas and Electric Company (PG&E). The goal of Energy Watch is to promote energy efficiency and climate action planning throughout the tri-county AMBAG region. AMBAG Energy Watch designed a three phase program to assist jurisdictions with what has become known as "climate action planning."

The inventory for Santa Cruz was developed using the "Clean Air and Climate Protection" (CACP 2009) software developed by ICLEI. The inventory examines emissions by community sector and includes direct and indirect emissions. The study also predicts that under a "business-as-usual" scenario, the City of Santa Cruz's GHG emissions are estimated to grow by approximately 9% by the year 2020, which represents an average annual rate of increase of about 0.6% per year with the total increase between 2005 and 2020.

SB 375 REGIONAL TARGET

Senate Bill 375 established a basis for establishment of regional reduction targets related to transportation and land use. It is one of the CARB's *Scoping Plan* strategies to reduce greenhouse gas emissions from the transportation sector. As shown on Table 4.12-1, the "regional transportation-related GHG targets" reduction measure is estimated to reduce statewide GHG emissions by 5 million metric tons, approximately 3% of the total statewide GHG emissions reduction identified in the strategies outlined in the *Scoping Plan*.

In order to achieve these reductions, SB 375 requires metropolitan transportation plans to include a "*Sustainable Communities Strategy*" (SCS) to meet GHG reduction targets for vehicle travel set by CARB. SB 375 requires that CARB certify that the SCS will reach these targets by decreasing GHG emissions per capita from automobiles and light trucks for 2020 and 2035. Ultimately, transportation projects that are part of the SCS will have state transportation funding priority and will be eligible for streamlined CEQA processes (AMBAG, August 2011).

In September of 2010, the CARB adopted regional per capita greenhouse gas targets for each of California's eighteen metropolitan planning regions as required under SB 375. The Monterey Bay Area's specific mandate is to reduce per capita greenhouse gas emissions from cars and light trucks to 2005 levels by 2020 and to reduce per capita levels to 5% below 2005 levels by 2035. This results in a regional per capita GHG emissions target of 14.1 pounds per day per capita for 2020 and 13.4 pounds per day per capita for 2035.

Under SB 375, the AMBAG is required to adopt a "Sustainable Communities Strategy" (SCS) in the next Metropolitan Transportation Plan. This strategy will build on information developed through "Envisioning the Monterey Bay Area" study (AMBAG, March 2011). "Envisioning the Monterey Bay Are – A Blueprint for Sustainable Growth and Smart Infrastructure" is a blueprint for the future describing how the communities of the Monterey Bay area might grow in a sustainable fashion over the next 25 years. Regional and local agencies worked together to evaluate current trends regarding the distribution of population and employment in comparison to: 1) improving mobility; 2) reducing GHG emissions; 3) providing housing and employment

opportunities; and 4) protecting natural and cultural resources. The study develops a preferred growth scenario that maximizes the achievement of these outcomes that will serve as the basis for SB 375's Sustainable Communities Strategy that will demonstrate how the region will reduce per capita greenhouse emissions by 5% from the automobiles and light trucks by 2035 (AMBAG, March 2011).

Under the "Sustainable Growth Patterns" scenario developed as an alternative to current growth patterns, the region's urban footprint would increase by 20,000 acres by 2035, which is less than half of the approximately 43,000 acres that are projected to otherwise be developed. Under this scenario, the majority of the region's forecast growth occurs within a comfortable walking distance to transit corridors and neighborhood centers within "Blueprint Priority Areas" identified in the study that are primarily higher density lands within cities in proximity to transit and walking opportunities. The City of Santa Cruz is as a "Blueprint Priority Area." Consideration of policies and specific actions to see this sustainable pattern become a reality would be within the purview of individual agencies.

4.12.2 RELEVANT PROJECT ELEMENTS

PROPOSED GOALS, POLICIES & ACTIONS

The proposed *General Plan 2030* includes goals, policies and actions that address climate change. The NATURAL RESOURCES AND CONSERVATION chapter includes one goal with four polices and19 accompanying actions that address climate change, including preparation and implementation of a "Climate Action Plan" to attain emissions reductions goals. The proposed climate change goal is:

> NRC4 *Effective leadership and action in reducing and responding to global warming.*

Overall, the proposed *General Plan 2030*'s policies and actions seek to:

- Reduce community-wide GHG emissions 30% by 2020 and 80% by 2050 (compared to 1990 levels);
- Require all new development be carbon neutral by 2030;
- Support initiatives, legislation, and actions for reducing and responding to climate change;
- Encourage community involvement and public-private partnerships to reduce and respond to global warming; and
- Minimize impacts of future sea level rise.

Additionally, policies in other chapters of the draft General Plan support local, state and federal actions to reduce carbon dioxide and GHG emissions (HZ2.1.1, HZ2.1.2) and efforts to improve local energy efficiency (NRC7.1), including a reduction in gas and electricity consumption (NRC7.1.1). A number of policies are also directed to reducing automobile trips and creating sustainable development and land use patterns, which would result in further reductions of automobile trips, and thus, emissions as reviewed in the TRAFFIC AND

TRANSPORTATION (Chapter 4.4) section of this EIR. LAND USE goal LU1 and supporting policies and actions seek sustainable land uses within the City.

FUTURE DEVELOPMENT POTENTIAL

The *General Plan 2030* Land Use Map and land use designations are largely unchanged from the 1990-2005 General Plan / Local Coastal Program, except for three new mixed use land designations that have been developed and would be applied to the following major transportation corridors: Mission Street, Ocean Street, Soquel, Avenue, and Water Street. Additionally, land use designation changes are proposed for three specified sites (Swenson, Golf Club Drive area, and an addition to the Dimeo Lane landfill site [for non-landfill uses]). Some of the draft *General Plan 2030* policies and actions support certain types of land uses and/or intensified redevelopment. In particular, infill, high density and mixed use development is encouraged and supported as summarized in Table 4.1-5 in the LAND USE (Chapter 4.1) section of this EIR.

4.12.3 IMPACTS AND MITIGATION MEASURES

CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with the California Environmental Quality Act (CEQA), State CEQA Guidelines (including Appendix G), City of Santa Cruz plans, policies and/or guidelines, and agency and professional standards, a project impact would be considered significant if the project would:

12a Generate greenhouse gas emissions, either directly or indirectly, that in conjunction with other global greenhouse gas emissions that will make a cumulatively considerable contribution to substantial adverse physical effects on the environment related to global climate change; or

12b Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

An interpretation of these thresholds is described below.

AB 32, the California Global Warming Solutions Act of 2006, requires that greenhouse gases emitted in California be reduced to 1990 levels by the year 2020 and 80 percent below 1990 levels by 2050. The 2020 reduction target equates to a decrease of approximately 30 percent below the 1990 GHG emissions. Under AB 32, the CARB published its Scoping Plan in 2008, which details measures that could achieve the reduction goals of AB 32. The reduction goals are derived from the IPCC's climate stabilization models, which predict the CO_2e concentrations needed to stabilize mean global warming at approximately 2°C rise from current global mean temperature. The Scoping Plan encourages local governments to reduce their GHG emissions by 15 percent as part of the overall statewide efforts to achieve reductions on the order of 30 percent.

To date, no state agency has adopted significance criteria for GHG emissions. As part of OPR's revisions to the CEQA Guidelines regarding GHG emissions in 2010, CARB was asked to provide technical recommendations for setting thresholds of significance for GHG emissions, and recommendations for establishing a threshold approach were released by CARB technical staff in October 2008. The recommendations set forth an approach for industrial, residential and commercial projects with a numeric threshold level recommended only for industrial uses. The recommendations have not been adopted or included in other state-adopted documents. On December 30, 2009, the Natural Resources Agency adopted the CEQA Guidelines Amendments addressing greenhouse gas emissions, but these amendments do not specify significance thresholds for GHG emissions. Instead, the regulations support the discretion of local agencies to develop their own thresholds based on credible substantial evidence. (CEQA Guidelines, section 15064.4.)

The project site is located within the jurisdiction of the Monterey Bay Unified Air Pollution Control District (MBUAPCD), which to date, has not adopted significance criteria or thresholds. In June 2010, the Bay Area Air Quality Management District (BAAQMD) in the San Francisco Bay area adopted its revised CEQA Guidelines, which include thresholds of significance for greenhouse gas emissions. The BAAQMD is the first regional air district to adopt numeric thresholds for greenhouse gas emissions for residential and commercial projects. These guidelines identify 6.6 MT CO_2e per year per capita (residents and employees) or a qualified GHG Reduction Strategy as a significance threshold for General Plans (Bay Area Air Quality Management District, June 2010). The per capita threshold was based on the state's emissions goal for 2020 divided by the state's estimate of total residents and employees in that year (Bay Area Air Quality Management District, May 2010).

The project site is located within the jurisdiction of the Monterey Bay Unified Air Pollution Control District (MBUAPCD), which to date, has not adopted significance criteria or thresholds. However, in June 2011, the MBUAPCD initiated a process to develop GHG emission thresholds for project and plan level impact analyses. District staff have recommended a threshold of 6.6 MT CO_2e /year per service population (residents/employees) for General Plans (Monterey Bay Unified Air Pollution Control District, May 2011), which is the same threshold adopted by the BAAQMD. As indicated above, this approach is based on the total emissions target for the state of California divided by the state's projected service population. GHG thresholds are under review by the MBUAPCD, but have not yet been adopted.

Therefore, a threshold of 6.6 MT CO_2e /year per service population (residents/employees) will be used for this EIR as it is being considered as such by the MBUAPCD and already has been adopted as a threshold for general plans in the Bay Area. Furthermore, it is based on the state's overall population and emission goals, and as such, is supported by substantial evidence.

As noted above, on a local level, in its draft Climate Action Plan, the City of Santa Cruz has set reduction goals of 30% below 1996 levels by 2020, and 80% below by 2050 (City of Santa Cruz, September 2010). The draft CAP is written to achieve the draft General Plan goals to reduce community-wide greenhouse gas emissions 30% by 2020 and 80% by 2050 (compared to 1990 levels), and for all new buildings to be emissions-neutral by 2030. Because the City has not yet adopted the CAP, however, this plan does not yet have the force of law; however, it is presented to show the City is proposing to provide GHG reductions locally that will complement State and international efforts to stabilize climate change.

IMPACT ANALYSIS

Based on the significance criteria identified above, the following impact analyses address: generation of greenhouse gas emission (12a) and potential conflicts with plans adopted for the purpose of reducing greenhouse gas emission (12b).

Potential Future Development & Buildout

Adoption and implementation of the proposed *General Plan 2030* would not directly result in increased new development. However, the draft General Plan includes policies and a land use map that support additional development. As described in the PROJECT DESCRIPTION and LAND USE sections of this EIR (Chapters 3.0 and 4.1, respectively), buildout projections were estimated for the draft General Plan to provide an estimate of the amount of development that may be expected to occur by the year 2030.[6] The projected development includes 3,350 additional residential dwelling units with an associated population increase of 8,040 residents as discussed in the POPULATION AND HOUSING (Chapter 4.2) section of this EIR.

The buildout projections also estimate approximately 3,140,000 additional square feet of new commercial, office and industrial uses by the year 2030. Based on the non-residential uses, it is estimated that approximately 8,665 new jobs could be generated. This is based on an estimated 2.0 employees per 1,000 square feet of commercial and retail; 2.3 employees per 1,000 square feet for industrial space, and 3.3 employees per 1,000 square feet of office space, which results in approximately 4,335 commercial and industrial jobs and approximately 4,205 office jobs..

Development under the proposed General Plan would primarily occur on remaining vacant infill sites, on underutilized properties that could redeveloped at higher densities and/or land use intensities, and in the new mixed-use districts along the City's four major street corridors: Mission Street, Ocean Street, Soquel Avenue, and Water Street. Based on the estimated development occurring under the proposed plan,[7] approximately 55% of all new housing, 45% of new commercial development and 52% of new office development would located along these corridors.

[6] The projections are based on the draft Land Use Map, taking into account land use map changes, vacant lands, sites subject to reuse or redevelopment, and underutilized parcels, assuming that not all development will occur at maximum density. On average it is assumed that all new development will occur at 80% of the permitted residential density or floor area ratio. See Appendix B for further discussion.

[7] See Table 3.3 in the PROJECT DESCRIPTION (Chapter 3.0) section of this EIR and Figure 2-3 for estimated distribution of new development in specific areas in the City.

Impact 4.12-1 Generation of Greenhouse Gas Emissions
Adoption and implementation of the proposed *General Plan 2030* could indirectly result in increased greenhouse gas emissions from development accommodated by the proposed plan. However, the emissions level would not be considered substantial compared to long-term forecasts and state and regional targets, and implementation of the proposed *General Plan 2030* policies and actions, as well as planned implementation statewide actions, would further reduce emissions. Therefore, this is considered a *less-than-significant impact*.

As indicated above, adoption and implementation of the proposed *General Plan 2030* would not directly result in new development. However, the draft General Plan includes policies and a land use map that support additional development. This potential development, as summarized above, would result in an increase in GHG emissions related to transportation, energy use, and utilities and indirect emissions related to wastewater treatment and waste disposal.

A calculation of GHG emissions associated with potential development under the proposed General Plan was prepared by Donald Ballanti, Certified Consulting Meteorologist, and is included in Appendix E. The emissions were estimated using the BGM Model developed by the BAAQMD and the URBEMIS-2007 model. The URBEMIS model is a land use based model with land use and trip generation inputs. The trip rates were adjusted to account for interactivity between land uses and smart growth factors (enhanced mixed uses, local serving retail, transit/bike/pedestrian accessibility) included in the proposed General Plan, which were developed as part of the traffic impact analysis for this EIR. BAAQMD's Greenhouse Gas Model (BGM) is an Excel spreadsheet program that allows users to estimate operational greenhouse gas (GHG) emissions from land development projects. BGM reads URBEMIS-2007 project files to generate a portion of a project's GHG emission estimates.

The models were run for the estimated General Plan related development for the year 2030. A second URBEMIS-2007 and BGM run was made for the same land use/trip inputs but for the year 2008.[8] Comparison of the two sets of results revealed the BGM includes the effects of vehicle fleet changes and California fuel rules, as transportation emissions from the same land use inputs drop 30% between 2008 and 2030. The URBEMIS-2007/BGM results were further adjusted to reflect the State energy efficiency regulations and AB 32 programs based on the BAAQMD's estimated reductions due to implementation of state programs, which have also been applied to the proposed project. The results are summarized in Table 4.12-3.

The total GHG emissions generated in the City as a result of potential buildout under the General Plan to the year 2030 is estimated as 53,172 metric tons/year CO_2 equivalent (MT CO_2e), which would occur sometime between now and 2030. Emissions for the same level of development if it all occurred in 2008 are estimated at approximately 71,121 MT CO_2e. Thus, greenhouse emissions resulting from General Plan projected buildout would be reduced roughly by 25% with implementation of some of the expected statewide programs in effect (Ballanti,

[8] The year 2008 was used as the City has developed an emission inventory for 2008, and it is the closest available emissions inventory to when the EIR Notice of Preparation was released in March 2009.

2011). As indicated above, these results also indicate that the BGM model includes the effects of vehicle fleet changes and California fuel rules, as transportation emissions from the same land use inputs drop almost 30% between 2008 and 2030.

TABLE 4.12-3
General Plan 2030 Growth GHG Emissions (in CO_2e Equivalent Metric Tons/Year)

Source	2008	2030 [Based on New Travel in City Limits]
Transportation	39,805.84	28,208.41
Area Sources	2,918.54	2,918.54
Electricity	14,861.48	9,148.39
Natural Gas	6,809.85	6,162.91
Water & Wastewater Treatment	679.88	636.05
Solid Waste	6,045.40	6,061.82
Total	71,120.98	53,172.12

Source: Donald Ballanti, April 2011

Table 4.12-4 shows existing (2008) emissions and provides estimated community emissions in 2030 that were developed by City staff for this EIR, using AMBAG's recent 2011 emissions inventory for the City as updated by the City. The City's projection includes AMBAG's projections, but does not account for existing landfill operations, only future operations, and thus, are slightly lower than AMBAG's. These projections are based on historic growth patterns, and identify an increase of approximately 70,821 MT CO_2e between 2005 and 2030. The estimated *General Plan 2030* GHG emissions would result in a total City emissions of 404,493 MT CO_2e over 2008 levels (351,321 in 2005 + 53,172 = 404,493), which is close to, but less than, the 408,983 MT CO_2e forecast for 2030 for the residential, commercial/industrial and transportation sections. In this respect, the growth accommodated by the proposed General Plan would not result in a substantial increase in GHG emissions over what has been estimated.

TABLE 4.12-4
City Of Santa Cruz Projected Community GHG Emissions Projections

Sector	2008 [1]	2030 [2]	Annual Growth Rate
Residential	76,805	76,383	0.0046
Commercial/Industrial	93,304	142,292	0.0064
Transportation	160,762	190,248	0.0046
Municipal	10,261	10,313	0.0077
Waste	10,189	2,906	0.0077
TOTAL	**351,321**	**422,142**	

In metric tons Co_2e
[1] City of Santa Cruz Climate Action Team
[2] AMBAG Energy Watch Program as updated by the City of Santa Cruz

As indicated above, to date, no state agency has adopted significance criteria for GHG emissions, although the (BAAQMD in the San Francisco Bay area adopted revised CEQA Guidelines, which identify 6.6 MT CO_2e per year per capita (residents and employees) or a qualified GHG Reduction Strategy as a significance threshold for General Plans. Staff of the MBUAPD are also considering this standard as a significance threshold for General Plans. The City does not yet have an adopted GHG Reduction Strategy. Since the BAAQMD's significance threshold for general plans is directly linked to the State's reduction goals, and the MBUAPCD is currently the same standards, it is an appropriate method to gauge the overall significance of GHG emissions.

Based on the emissions data in Table 4.12-4, in 2008, the City had a 3.82 MT CO_2e per capita GHG emission rate (residents and employees[9]). Thus, the City's per capita emissions is already below the overall rate of 6.6 MT CO_2e per year per capita that is based on the state's reduction goals. With addition of the indirect General Plan emissions, the annual per capita would be about 3.72 MT CO_2e per year per capita, slightly less than the existing per capita rate and still less than the overall projected state rate as embodied in the GHG significance threshold for General Plans. Thus, under this approach, emissions resulting from the proposed general plan would not be considered substantial.

According to the Draft *General Plan 2030*, the City seeks to further reduce its contribution to greenhouse gas emissions through land use planning, program development, investment in energy efficient infrastructure, and increased use of renewable energy. Green building policies and actions will incorporate energy efficiency measures, water stewardship, use of sustainable building materials derived from renewable resources, reduction of waste through recycling and reuse, and smart growth and sustainable development practices. In addition to defining shorter-term strategies to address likely impacts of climate change on city infrastructure and resources, the City must also set planning goals to minimize future risks of sea level rise and climate change.

The proposed *General Plan 2030* includes a number of policies and actions that, if implemented, would reduce greenhouse gas emissions and the project's contribution to global climate change impacts as a result of development accommodated under the General Plan. In particular, the City seeks to achieve a 30% reduction in GHG emissions by 2020 and 80% by 2050 (NRC4.1.1) with all new development being carbon neutral by the year 2030. Other policies and actions seek to reduce vehicle emissions by 30% (NRC4.1.3) in addition with other transportation policies to reduce vehicle trips, and promote energy efficiency. Table 4.12-5 summarizes policies that directly or indirectly reduce greenhouse gas emissions and impacts. The current draft CAP does not extend to the year 2030 or specifically account for General Plan growth, but could be amended to do so. Additionally, implementation of the state's "Scoping Plan" will improve fuel, vehicle and energy efficiency, among other actions, that would also

[9] In 2008, the City had 58,125 residents (per California Department of Finance records) and approximately 33,925 employees (per AMBAG estimates, June 2008) for a total service population of 92,050. Buildout under the draft General Plan could result in 8,040 new residents and 8,665 new employees for an increase of 16,705 and total service population of 108,755.

result in reduced GHG emissions for General Plan buildout, although some reductions have been accounted for in the emissions modeling for the project growth.[10]

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not directly result in new development, but new development accommodated by the plan would result in greenhouse gas emissions that contribute to global climate change impacts. However, the amount of estimated emissions are generally within future forecasts, and the addition of the project's emissions would not substantially change per capita emission rates within the City, and would in fact, slightly reduce them. Both the 2005 and 2030 per capita rates are below the per capita rate that has been determined necessary to successfully implement the State's AB 32 reduction goals statewide. Thus, indirect GHG emissions resulting from the project would not make a cumulatively considerable contribution to substantial adverse physical effects on the environment related to global climate change. Additionally, the proposed *General Plan 2030* includes goals, policies and actions that set forth measures to reduce GHG emissions as summarized on Table 4.12-5, including implementation of a Climate Action Plan with specified strategies for GHG emissions' reductions. Therefore, the proposed General Plan 2030's indirect generation of GHG emissions and contribution to global climate change impacts would be considered less-than-significant.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified. However, revision of the following *General Plan 2030* action is recommended.

Recommended Revisions to the *Draft General Plan 2030*

Revise or add policies/actions as indicated below. Deleted text is shown in ~~strikeout~~ typeface, and new text is shown in underlined typeface.

NRC4.1.2 Revise *Climate Action Plan* to include projected *General Plan 2030* growth to the year 2030, and implement municipal, community, and business sections of the Climate Action Plan on energy efficiency and expanded use of renewable energy.

[10] Measures such as the Renewable Portfolio Standard, improvements in energy efficiency through periodic updates to Title 24, Solar Roofs program and other measures were determined to account for an estimated 9.5% reduction in natural gas GHG emissions and a 38.2% percent reduction in GHG emissions from electricity by 2020 according to BAAQMD studies These reductions were applied to the BGM emission calculations (Ballanti, April 2011). Future improvements related to wastewater, water efficiency and solid waste generation reductions would also reduce water/wastewater and solid waste emissions, but BGM cannot take this into account. Therefore, the emissions projections developed for this EIR are conservative.

TABLE 4.12-5
Proposed General Plan Policies & Actions that Reduce GHG Emissions & Global Climate Change Impacts

Type of Measure / Action	Policies / Actions
REDUCE GHG EMISSIONS & VEHICLE EMISSIONS	• 30% by 2020 and 80% by 2050, compared to 1990 levels: NRC4.1.1 • Vehicle emissions reduced 30% by 2020: NRC4.1.3 • Develop carbon dioxide emissions limits: HZ2.1.1 • Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1, M3.1.1, M3.1.2 • Public outreach to reduce energy use by 30%: NRC4.3.1 • Implement Climate Action Plan, which addresses energy efficiency: NRC4.1.2, NRC4.3.3, NCR4.1.8 (tracking & reporting) • Develop City carbon dioxide budget: HZ2.1.2
PROMOTE ENERGY EFFICIENCY	• Expand municipal energy efficiency programs: NRC4.1.4. • Support solar energy, including solar generation on municipal buildings: NRC4.1.5, NRC4.3.4, NRC4.3.5. • Establish Energy Conservation Team & work with Santa Cruz Regional Compact on Climate Change for County-wide reduction of greenhouse gas emissions: NRC4.1.6, NRC4.1.7, NRC4.2.1 • Promote efficiency upgrades and renewable energy over use of carbon offsets to meet climate reduction goals: NRC4.1.9 • Energy reduction & efficiency: NRC7.1 & actions • Promote energy-efficient local transportation: NRC7.3 & actions
SUPPORT LEGISLATION & FUTURE PROGRAMS	• Support legislation and actions that reduce GHG emissions: NRC4.2, HZ2.1.1 • Implement future programs developed by the Regional Compact that meet city greenhouse gas reduction goals: NRC4.2.2 • Support & implement local, state, federal actions to reduce GHG emission: HZ2.1.2 • Community involvement and public outreach efforts to reduce energy use and GHG emissions: NRC4.3, NRC4.3.1, NRC4.3.2.
ALTERNATIVE TRANSPORTATION MODES TO REDUCE EMISSIONS	• Plan and support alternative transportation options, modes and strategies: NRC4.4.2. • Encourage use of alternative transportation modes: M.2.1.2 • See TABLE 4.4-4 in the TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list
SUPPORT LAND USE PATTERNS TO REDUCE VEHICLE TRIPS & EMISSIONS	• Reduce auto use with pedestrian/transit-oriented activity centers (M1.1) and Encourage land use changes that reduce auto use: LU4.2 • Encourage home occupations & telecommuting: LU4.4, LU4.4.1 and Live-work units: LU4.1.4, HA4.4 (artists) • Encourage mixed uses: LU3.5 (Lower Pacific), LU3.6 (River) , LU3.10 & LU3.10.1 (commercial uses allowed in all districts), LU4.1.1, LU4.2.2 (new districts) & Encourage assembly of small parcels along transit: CD3.3, CD3.3.1, CD3.3.2 • SEE TABLE 4.4-4 in the TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list
PREPARE FOR CLIMATE CHANGE	• Early actions on issues (NRC4.4) and draft policies to address development in High Risk areas (NRC4.4.1) • Minimize impacts of future sea level rise (NRC4.5); complete City Vulnerability Study and Climate Change Risk Assessment (NRC4.51)

Impact 4.12-2: Conflicts with Applicable Plans
Potential development that could be accommodated in the draft *General Plan 2030* would result in increased greenhouse gas emissions, but the proposed project would not conflict with adopted plans. Therefore, there is *no impact*.

The project would not conflict with state plans adopted for the purpose of reducing greenhouse gas emissions. The City of Santa Cruz is in the process of preparing a Climate Action Plan to address citywide greenhouse emissions, but a final plan has not been completed or adopted. The City's draft "Climate Action Plan" is being prepared in accordance with the proposed *General Plan 2030* policies and actions, which call for preparation and implementation of such a plan.

The State's "Scoping Plan" includes strategies for transportation, energy, water and other sectors that are not directly applicable to the proposed General Plan, but nonetheless, the proposed General Plan includes several policies that are consistent with the State's strategies, and therefore, if implemented, would assist the State in meeting its reduction goals under AB 32. In particular, the draft *General Plan 2030* seeks to reduce emissions by 30% by 2020 and 50% by 2050 compared to 1990 levels, which is consistent with the goals set forth in the California Global Warming Solutions Act of 2006. The draft plan also includes new mixed-use land use designations and numerous policies that support higher density infill projects along transit corridors in conjunction with transportation policies to reduce auto trips. This is consistent with the intent of the Regional Transportation Target component of the Scoping Plan, which is being further defined by AMBAG and preparation of a Blueprint Plan in to achieve compliance with SB 375's Sustainable Communities Strategy.

Additionally, the California Attorney General Office (AGO) has developed a list of examples of policies to address climate change and sustainability in General Plans (California Attorney General, 1/22/10), as well as a list of project-level mitigation measures. This list was updated in 2010. In particular the AGO list references the top ten strategies recommended by CAPCOA[11] for local agencies to consider in General Plans. Table 4-12-6 summarizes these strategies with a cross reference to proposed *General Plan 2030* policies and actions that are consistent with these strategies. As shown, the proposed plan includes policies that address most of these key strategies.

Therefore, the project would not conflict with any adopted plans, policies or regulations of an agency adopted for the purpose of reducing greenhouse gas emissions.

Conclusion. Adoption and implementation of the proposed *General Plan 2030* would not result in conflicts or inconsistencies with policies adopted to protect

[11] CAPCOA (California Air Pollution Control Officers Association). June 2009. "Model Policies for Greenhouse Gases in General Plans." Appendix E identifies ten strategies are widely applicable throughout California in varying degrees and are the recommended initial local government focus for future General Plan policies, Climate Action Plan development, and Blueprint Planning, while acknowledging that not all strategies will work equally within the diversity of cities and counties in California.

biological resources. Thus, there is *no impact* related to this issue as summarized on Table 4.8-5. Therefore, the project would not result in conflicts with adopted plans.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

TABLE 4.12-6
Proposed General Plan Policies & Actions: Consistency with California Attorney General Recommendations

Recommended Strategy	Policies / Actions
1) Promote • Smart growth, • Jobs/housing balance, • Transit-oriented development, • Infill development through land use designations.	• Reduce auto use with pedestrian/transit-oriented activity centers: M1.1, M3.1, M3.1.1, M3.1.2 • Encourage mixed uses: LU3.5 (Lower Pacific), LU3.6 (River) , LU3.10 & LU3.10.1 (commercial uses allowed in all districts), LU4.1.1, LU4.2.2 (new districts) & Encourage assembly of small parcels along transit: CD3.3, CD3.3.1, CD3.3.2 • Vehicle emissions reduced 30% by 2020: NRC4.1.3 • Reduce auto dependence, vehicle trips and peak hour trip & increase vehicle occupancy: M1.1, M3.1, M3.1.1, M3.1.2 • Ensure optimum utilization of infill parcels: LU1.1
2) Support for and funding of transit, bicycle, and pedestrian connections through transit and trail planning and regional cooperation.	• Plan and support alternative transportation options, modes and strategies: NRC4.4.2. • Encourage use of alternative transportation modes: M.2.1.2 • See TABLE 4.4-4 in the TRANSPORTATION & TRAFFIC section of this EIR (Chapter 4.4) for a complete list of policies and actions that support transit, bicycle and pedestrian
3) Promotion of energy- and water-efficient buildings (e.g., LEED buildings) through green building ordinances, project timing prioritization, and other implementing tools.	• Energy reduction & efficiency: NRC7.1 & actions • Reduce electricity and natural gas use by 20%: NRC7.1.1 • Adopt Model Lighting Ordinance: NRC7.1.2 • Improve energy efficiency in parks: NRC7.1.10 • Continue to install energy efficient systems in park and recreational facilities: NRC7.1.11 • Install energy-efficient street lighting: MC.2.10 • Increase local use and production of renewable energy:NRC7.1.3 • Require passive heating and cooling in new development: NRC7.1.4 • Require City facilities to increase green electricity: NRC7.1.5 • Install energy and water efficient appliances: NRC7.4.1 • Require new development to use high efficiency fixtures: NRC7.4.2 • Support gray water collection and reuse: NRC7.4.2, NRC7.4.3
4) Promotion of green procurement and alternative fuel vehicle use through municipal mandates and voluntary bid incentives.	• Reduce consumption of fuels: NRC7.3.1 • Establish telecommuting for City staff: NRC7.3.3 • Investigate partnerships with UCSC for electric car use: NRC7.3.5 • SEE TABLE 4.4-4 in Chapter 4.4 for policies-actions to reduce auto use. **(CONTINUED ON NEXT PAGE)**

TABLE 4.12-6
Proposed General Plan Policies & Actions: Consistency with California Attorney General Recommendations

Recommended Strategy	Policies / Actions
5) Support for alternative fuel facilities and infrastructure through land use designations, zoning, and public-private partnerships.	• Purchase City vehicles with fuel efficient or alternative fuel systems: NRC7.3.2, NRC7.3.4
6) Support for renewable energy generation (utility and residential) through feasibility evaluations, land use designations, and zoning.	• Expand municipal energy efficiency programs: NRC4.1.4. • Support solar energy, including solar generation on municipal buildings: NRC4.1.5, NRC4.3.4, NRC4.3.5. • Promote efficiency upgrades and renewable energy over use of carbon offsets to meet climate reduction goals: NRC4.1.9
7) Promotion of waste diversion, recycling, energy efficiency and energy recovery in cooperation with public services districts and private entities.	• Zero Waste goal: CC6.1 • Reduce recyclable materials at landfill: CC6.4.4, CC6.1.13 (plastic bags), CC6.1.17 & HZ2.1.4 (ban polystyrene foam), CC6.4.4 • Prepare & implement recycling and reduction plans and incentives to encourage recycling: CC6.1.1, CC6.1.2, CC6.1.3, CC6.1.7 (new development), CC6.1.14 • Provide efficient waste & recycling service: CC6.2, CC6.2.2
8) Support for urban and rural forestry through tree planting requirements and Programs.	• Protect tree resources & heritage trees: NRC5.1, CD4.3.4 • Maintain & increase urban tree canopy & tree diversity: NRC5.1.2, NRC5.2, NRC5.2.1 (additional street trees) • Educational programs to promote urban forest: NRC5.1.1
9) Community outreach and education to foster community involvement, input, and support for GHG reduction planning and implementation.	• Public outreach to reduce energy use: NRC4.3.1 • Community involvement and public outreach efforts to reduce energy use and GHG emissions: NRC4.3, NRC4.3.1, NRC4.3.2.
10) Regional cooperation to find cross-regional efficiencies in GHG reduction investments and to plan for regional transit, energy generation, and waste recovery facilities.	• Establish Energy Conservation Team & work with Santa Cruz Regional Compact on Climate Change for County-wide reduction of greenhouse gas emissions: NRC4.1.6, NRC4.1.7, NRC4.2.1 • Support legislation and actions that reduce GHG emissions: NRC4.2, HZ2.1.1 • Implement future programs developed by the Regional Compact that meet city greenhouse gas reduction goals: NRC4.2.2 • Support & implement local, state, federal actions to reduce GHG emission: HZ2.1.2 • Community involvement and public outreach efforts to reduce energy use and GHG emissions: NRC4.3, NRC4.3.1, NRC4.3.2.
Based on California Attorney General Recommendations for General Plans (1.22.10), which references the CAPCOA "Top Ten Actions" local governments can utilize in General Plans to address greenhouse gas reduction (CAPCOA, June 2009).	

REFERENCES

Association of Monterey Bay Area Governments (AMBAG).

- March 2011. "Envisioning the Monterey Bay Area – A Blueprint for Sustainable Growth and Smart Infrastructure." Online at:
- http://www.ambag.org/programs/blueprint/index.html
- September 9, 2010. Letter to California Air Resources Board regarding "Greenhouse Gas Targets for the Monterey Bay Area."
- August 11, 2010. Memorandum to AMBAG Board of Directors regarding "Recommendations for a Regional GHG Target Pursuant to SB 375."
- August 11, 2010. Memorandum to AMBAG Board of Directors regarding "Adoption of a Regional GHG Target Pursuant to SB 375."
- August 2, 2010. Memorandum to California Air Resources Board regarding "Scenario Testing for Regional GHG Target Setting Pursuant to RTAC Recommendations Under SB 375.

Association of Monterey Bay Area Governments Energy Watch Program. "City of Santa Cruz Greenhouse Gas Emissions Inventory - 2005 Community Wide Baseline Report."

Donald Ballanti, Certified Consulting Meteorologist. August 29, 2011. Memorandum regarding "Santa Cruz GP Criteria Pollutant Emissions."

Bay Area Air Quality Management District. June 2010. "California Environmental Quality Act Guidelines." Online at: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx

California Air Resources Board.

- September 22, 2010 (Last Updated). "Greenhouse Gas Inventory Data – 2000 to 2008." Online at: http://www.arb.ca.gov/cc/inventory/data/data.htm
  - MAY 12, 2010. "California Greenhouse Gas Inventory for 2000-2008 – By — by Category as Defined in the Scoping Plan"
  - May 28, 2010. "Trends in California Greenhouse Gas Emissions for 2000 to 2008 – by Category as Defined in the Scoping Plan."
- August 9, 2010. "Staff Report – Proposed Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375."
- December 2008. *Climate Change Proposed Scoping Plan – A Framework for Change*." December 2008. Online at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf
- October 24, 2008. "Preliminary Draft Staff Proposal – Recommended Approaches for Setting Interim Significance Thresholds for Greenhouse Gases under the California Environmental Quality Act."
- November 16, 2007. "Staff Report – California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit."
- April 20, 2007. "Proposed Early Actions to Mitigate Climate change in California."

California Attorney General's Office. 20112011. "CEQA and General Plans" website; Online at: http://ag.ca.gov/globalwarming/ceqa/generalplans.php

- 1/22/10 [REV]. "Sustainability and General Plans: Examples of Policies to Address Climate Change." Online at:

California Climate Action Team.

- December 2010. "Climate Action Team Report to governor Schwarzenegger and the California Legislature." California Environmental Protection Agency.
- April 2010. "Biennial Report." Executive Summary.

California Climate Change Center.

- March 2009. "The Impacts of Sea-Level Rise on the California Coast." Prepared by Matthew Heberger, Heather Cooley, Pablo Herrera, Peter H. Gleick, and Eli Moore of the Pacific Institute.
- July 2006. "Our Changing Climate, Assessing the Risks to California."
- March 2006. "Projecting Future Sea Level Rise." Prepared by Dan Cayan, Peter Bromirski, Katharine Hayhoe, Mary Tyree, Mike Dettinger, and Reinhard Flick.

California Department of Water Resources. 2009 Update. "California Water Plan Highlights." http://www.waterplan.water.ca.gov/docs/cwpu2009/0310final/highlights_cwp2009_page.pdf

California Energy Commission. December 2006. "Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004". Online at: http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. April 2009. *Indicators of Climate Change in California.*

California Governor's Office of Planning and Research.

- April 13, 2009. Proposed SB97 CEQA Guidelines Amendments and Transmittal Letter Submitted to the Natural Resources Agency.
- California Governor's Office of Planning and Research. June 19, 2008. "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review."

California Natural Resources Agency. "2009 California Climate Adaptation Strategy." A Report to the Governor of the State of California in Response to Executive Order S-13-2008. Online at: http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F-ES.PDF

CAPCOA (California Air Pollution Control Officers Association). June 2009. "Model Policies for Greenhouse Gases in General Plans."

City of Santa Cruz, Climate Action Program.

- October 2010. *Draft City of Santa Cruz Climate Action Plan – Executive Summary.*
- September 2010. *Draft City of Santa Cruz Climate Action Plan*

- February 2010. "City of Santa Cruz Inventory of Municipal and Community Greenhouse Gas Emissions, 1996, 2000 and 2005 Revisions & Draft 2008 Inventory."
- August 2008. "City of Santa Cruz Greenhouse Gas Emissions Inventory – 2005 Municipal and Community Emissions."

Climate Action Compact [from city website at: http://www.cityofsantacruz.com/index.aspx?page=1231).

ICLEI, Local Governments for Sustainability website: http://www.iclei.org/index.php?id=about).

International Panel on Climate Change.

- IPCC website, "Organization" page; online at: http://www.ipcc.ch/organization/organization.shtml).
- 2007. R.B. Alley et al. "Summary for Policymakers" in *Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. Online at: http://www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html.

Monterey Bay Unified Air Pollution Control District. May 18, 20ll. Staff Report regarding " Presentation on Thresholds of Significance for Greenhouse Gases and Provide Suggestions to Staff for the Recommendation to be Presented at the June 2011 Board Meeting."

United Nations Framework Convention on Climate Change (UNFCCC). Website, online at: http://unfccc.int/essential_background/items/2877.php.

U.S. Department of Commerce. National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center, NOAA Satellite and Information Service. February 23, 2010. "Greenhouse Gases Frequently Asked Questions." Online at: www.ncdc.noaa.gov/faqs/climfaq02.html

U.S. Environmental Protection Agency. FEBRUARY 15, 2011. "Draft Inventory of U.S. greenhouse Gas Emissions and Sinks:1990 – 2009." Publication 430-R-11-005.

World Resources Institute. July 2009. "World Greenhouse Gas Emissions in 2005." Working Paper by Tim Herzog. Online at: http://www.wri.org/publication/world-greenhouse-gas-emissions-in-2005