

4.13 CLIMATE CHANGE

This section defines climate change and greenhouse gases (GHGs) and presents the current legislation and programs addressing climate change in California. The section quantifies existing and potential future greenhouse gas emissions associated with the proposed project. It also recommends mitigation measures that could be implemented to reduce those emissions.

4.13.1 Existing Conditions

Climate change refers to any significant change in measures of climate such as temperature, precipitation, or wind, lasting for decades or longer (EPA 2007). Climate change may result from:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- Natural processes within the climate system (e.g., changes in ocean circulation); or,
- Human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification, etc.)

Human activities, such as fossil fuel combustion and land use changes release carbon dioxide and other compounds, cumulatively termed GHGs. GHGs are effective in trapping infra-red radiation which otherwise would have escaped the atmosphere, thereby warming the atmosphere, the oceans, and earth's surface (EPA 2007).

4.13.1.1 Greenhouse Gases

GHGs are any gas that absorbs infrared radiation in the atmosphere (EPA 2007). GHGs, as defined in Assembly Bill 32 (AB 32), include the following gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). A brief summary of each GHG is summarized below (EPA 2007).

Carbon Dioxide

CO₂ is a naturally occurring gas and also a byproduct of burning fossil fuels and biomass, as well as land-use changes and other industrial processes (EPA 2007). Anthropogenic CO₂ is about 80% to 90% of the principal GHG that currently affects the Earth's radiative balance. Atmospheric CO₂ has a lifetime of about 50 to 200 years (Environmental Monitor, Spring 2007).

Methane

CH₄ is a hydrocarbon that is a GHG with a global warming potential most recently estimated at 23 times that of CO₂. Methane is produced through anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion. Atmospheric CH₄ has a lifetime of about 12 years (Environmental Monitor, Spring 2007).

Nitrous Oxide

N₂O is a powerful GHG with a global warming potential of 296 to 310 times that of CO₂. Major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning. Atmospheric N₂O has a lifetime of about 120 years (Environmental Monitor, Spring 2007).

Hydrofluorocarbons

HFCs are compounds introduced as alternatives to ozone depleting substances (commonly refrigerants). In serving many industrial, commercial, and personal needs, HFCs are emitted as byproducts of industrial processes and are also released during manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are powerful GHGs with global warming potential ranging from 140 to 11,700 times that of CO₂. Depending on the HFC species, atmospheric HFCs have a lifetime of about one to 15 years (US EPA, 2008; Environmental Monitor, Spring 2007).

Perfluorocarbons

PFCs were introduced as alternatives, along with hydrofluorocarbons, to ozone-depleting substances. PFCs are also emitted as byproducts of industrial processes and are used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they are powerful GHGs with global warming potential ranging from 6,500 to 9,200 times that of CO₂. Atmospheric PFCs have a lifetime of about 10,000 to 50,000 years (Environmental Monitor, Spring 2007).

Sulfur Hexafluoride

SF₆ is a colorless gas soluble in alcohol and ether, slightly soluble in water, with a global warming potential 23,900 times that of CO₂. SF₆ is a very powerful GHG used primarily in electrical transmission and distribution systems and as a dielectric in electronics. Atmospheric SF₆ has a lifetime of about 3,200 years (Environmental Monitor, Spring 2007).

4.13.1.2 Global Climate Change

A series of reports issued by the United Nations Intergovernmental Panel on Climate Change (UNIPCC) have synthesized recent scientific studies of climate change (UNIPCC 2007a, 2007b, 2000c). Key findings of these reports include the following:

- Global atmospheric concentrations of CO₂, CH₄, and N₂O have increased markedly as a result of human activities since 1750, and now are at about double pre-industrial levels. Global increases in CO₂ concentration are due primarily to fossil fuel use and land use change, and global increases in CH₄ and N₂O are due primarily to agriculture.
- Warming of the global climate due to GHGs is unequivocal, as evidenced by increases in air and water temperatures, widespread melting of snow and ice, and rising global average sea level. Most of the increase in global average temperatures since the mid-20th century is very likely due to increases in GHGs from human activities. GHG emissions increased 70% between 1970 and 2004.
- Numerous long-term climate changes observed have included changes in arctic temperatures and ice, precipitation, ocean salinity, wind pattern, and the frequency of extreme weather events such as droughts, heavy precipitation, heat waves, and tropical cyclone intensity.

- Continued GHG emissions at current rates would cause further warming and climate change during the 21st century that would very likely be larger than that observed in the 20th century.
- Climate change is expected to have adverse impacts on water resources, ecosystems, food and forest products, coastal systems and low-lying areas, urban areas, and public health. These impacts will vary regionally, and may be very expensive for agriculture and human activities. In some areas sea level rise may completely inundate now inhabited areas (e.g., river deltas, Pacific Islands).

4.13.1.3 California GHG Emissions and Climate Change

In California, the main sources of GHG emissions are from the transportation and energy sectors. According to the ARB draft GHG emission inventory for the year 2004, 39% of GHG emissions result from transportation and 25% of GHG emissions result from electricity generation. California produced 497 million metric tons of CO₂ equivalent (MMtCO₂e) in 2004 (ARB, 2007). California produces about 2% of the world's GHG emissions, with about 0.55% of the population.

The potential effects of future climate change on California resources include:

- Air temperature: Increases of 3 to 10.4 degrees Fahrenheit (°F) by the end of the century, depending on the aggressiveness of GHG emissions mitigation.
- Sea level rise: 6 to 30 inches by the end of the century, depending on the aggressiveness of GHG emissions mitigation.
- Water resources: Reduced Sierra snowpack, reduced water supplies, increased water demands, changed flood hydrology.
- Forests: Changed forest composition, geographic range, and forest health and productivity; increased destructive wild fires.
- Ecosystems: Changed habitats, increased threats to certain endangered species.
- Agriculture: Changed crop yields, increased irrigation demands, increased impacts from tropospheric ozone.
- Public health: Increased smog and commensurate respiratory illness and weather-related mortality (California Climate Change Portal [CCCCP] 2007).

4.13.2 Regulatory Setting

4.13.2.1 California Climate Change Legislation and Programs

Vehicle Climate Change Standards

AB 1493 (Chapter 200, Statutes of 2002), requires the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light-duty trucks. Regulations were adopted by the ARB in September 2004. The ARB analysis of this regulation indicates emissions savings of 1 MMtCO₂e by 2010 and 30 MMtCO₂e by 2020. For these standards to go into effect, EPA

must approve a waiver of Clean Air Act requirements to allow California (and other states) motor vehicle standards to exceed federal standards.

Assembly Bill 32

The California Global Warming Solutions Act of 2006 (AB 32, Health and Safety Code §§38500 et seq.) requires the ARB to design and implement emission limits, regulations, and other measures. These will reduce, by 2020, statewide GHG emissions in a technologically feasible and cost-effective manner to 1990 levels (representing a 25% reduction). The following summarizes the process and schedule for implementing AB 32:

- June 30, 2007 – ARB publishes a list of discrete early action GHG emission reduction measures that can be implemented prior to the measures and limits to be adopted to meet the 2020 limit.
- On September 7, 2007, the ARB released a list of additional early action measures and discrete early actions:
- January 1, 2008 – ARB determines what the statewide GHG emissions level was in 1990 and approves a statewide GHG limit that is equivalent to that level.
- January 1, 2008 – ARB adopts regulations requiring the reporting and verification of statewide GHG emissions.
- January 1, 2009 – ARB adopts a scoping plan for achieving the maximum technologically feasible and cost-effective reductions in GHG emissions from sources or categories of sources of GHGs by 2020.
- January 1, 2010 – ARB adopts and enforces regulations to implement the GHG emission reduction measures identified on the early action list in 2007.
- January 1, 2011 – ARB adopts regulations to achieve the required reduction of GHG emissions to 1990 levels by 2020.
- January 1, 2012 – GHG emission limits and emission reduction measures adopted by January 1, 2011, become enforceable.

Senate Bill 1368

SB 1368 (Public Utilities Code §8340 et seq.) is an AB 32 companion bill that was signed into law in 2006. It requires the CPUC to establish a GHG performance standard for base load generation from investor-owned utilities, and the California Energy Commission (CEC) to establish a similar standard for publicly-owned utilities. These standards may not exceed the GHG emission rate from a base load combined-cycle natural gas fired plant. The bill also requires all imported electricity provided to California to be generated from plants meeting CPUC and CEC standards.

Renewable Portfolio Standard Program

The CPUC and CEC coordinate the Renewable Portfolio Standard (RPS), which calls for more energy to come from clean, renewable sources such as wind and sun. In 2003, the Governor called for an acceleration of the RPS to 20% by 2010 rather than 2017; this goal was codified

by SB 107 (Chapter 464, Statutes of 2006). In 2005, the Governor called for an acceleration of the RPS to 33% by 2020.

Senate Bill 97

By enacting Senate Bill (SB) 97 in 2007, California's lawmakers expressly recognized the need to analyze greenhouse gas emissions as a part of the CEQA process. SB 97 required the Office of Planning and Research (OPR) to develop, and the Natural Resources Agency to adopt, amendments to the CEQA Guidelines addressing the analysis and mitigation of greenhouse gas emissions. Those CEQA Guidelines amendments clarified several points, including the following:

- Lead agencies must analyze the greenhouse gas emissions of proposed projects, and must reach a conclusion regarding the significance of those emissions. (See CEQA Guidelines §15064.4.)
- When a project's greenhouse gas emissions may be significant, lead agencies must consider a range of potential mitigation measures to reduce those emissions. (See CEQA Guidelines §15126.4(c).)
- Lead agencies must analyze potentially significant impacts associated with placing projects in hazardous locations, including locations potentially affected by climate change. (See CEQA Guidelines §15126.2(a).)
- Lead agencies may significantly streamline the analysis of greenhouse gases on a project level by using a programmatic greenhouse gas emissions reduction plan meeting certain criteria. (See CEQA Guidelines §15183.5(b).)
- CEQA mandates analysis of a proposed project's potential energy use (including transportation-related energy), sources of energy supply, and ways to reduce energy demand, including through the use of efficient transportation alternatives. (See CEQA Guidelines, Appendix F.)

As part of the administrative rulemaking process, the Natural Resources Agency developed a Final Statement of Reasons explaining the legal and factual bases, intent, and purpose of the CEQA Guidelines amendments. Other rulemaking documents can be accessed on the Natural Resources Agency's rulemaking website (<http://ceres.ca.gov/ceqa/guidelines/>). The amendments to the CEQA Guidelines implementing SB 97 became effective on March 18, 2010 (State of California, 2011).

Governor's Executive Orders

Executive Order S-3-05 was signed in 2005, and calls for a reduction of GHG emissions to 2000 levels by 2010, a reduction of GHG emissions to 1990 levels by 2020, and a reduction of GHG emissions to 80% below 1990 levels by 2050. The order directs the CalEPA secretary to coordinate development and implementation of strategies to achieve the GHG reduction targets in conjunction with the secretary of Business, the Transportation and Housing Agency, the secretary of the Department of Food and Agriculture, the secretary of the Resources Agency, the chairperson of the ARB, the chairperson of the CEC, and the president of the CPUC.

CalEPA developed the Climate Action Team (CAT), made up of representatives from the agencies listed above, to implement the strategies to reduce GHG emissions. The order also includes a reporting requirement for CalEPA to the governor and legislature. The first report was released in March 2006 (CalEPA, 2006), and a report will be issued bi-annually in the future. CAT has also issued a report on proposed early actions to mitigate climate change in California (CAT 2007).

Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS) (issued on January 18, 2007), calls for a reduction of at least 10% in the carbon intensity of California's transportation fuels by 2020. The executive order instructed CalEPA to coordinate activities between the University of California, the CEC, and other state agencies to develop and propose a draft compliance schedule to meet the 2020 target. Furthermore, the order directed the ARB to consider initiating regulatory proceedings to establish and implement the LCFS. The LCFS regulation was approved and went into effect on April 15, 2010.

4.13.2.2 San Luis Obispo County GHG Emission Reduction Program

San Luis Obispo County Air Pollution Control District

Local efforts to quantify and reduce GHG emissions have primarily been undertaken by the SLOAPCD. Many of the programs currently implemented by SLOAPCD to reduce emissions and exposure to criteria and toxic air pollutants may also reduce GHG emissions. The following is a brief summary of these programs:

- **Rules and Regulations:** Numerous rules adopted by the County Board of Supervisors and implemented by SLOAPCD to address criteria pollutant emissions also have the side benefit of reducing GHGs. For instance, several SLOAPCD rules address conventional emissions from combustion sources such as boilers, heaters, and engines that often result in equipment modifications or replacement that improves the energy efficiency of those units and reduces fossil fuel use. Similarly, rules that regulate or prohibit open burning activities reduce CO₂ emissions from that activity. SLOAPCD Rule 426 regulates landfill emissions of methane.
- **Clean Fuels:** SLOAPCD is actively involved in and supports the efforts of the Central Coast Clean Cities Coalition (C5), a local nonprofit coalition which promotes the use of cleaner alternative fuel technologies. With over 40% of the GHG emissions coming from mobile sources, these efforts are an essential tool in reducing fossil fuel use and associated CO₂ emissions.
- **Development Review:** Through the CEQA review process, SLOAPCD evaluates impacts from land use development projects and recommends measures to reduce emissions. Mitigation measures focus on reducing emissions from motor vehicles and improving energy efficiency, both of which directly reduce criteria pollutants and GHGs. Such strategies include incorporation of energy efficiency measures (increased insulation, high efficiency appliances and lighting, passive and active solar systems, etc.) that go beyond current building standards, and including Smart Growth principles into the project design to reduce vehicle trips and increase the viability of alternative transportation.
- **Grant Programs:** Many emission reduction projects funded through the various grant programs administered by SLOAPCD result in replacement or retrofit of older, high emission engines with cleaner and more efficient engines that simultaneously reduce

fuel use, thus reducing CO₂ emissions. Conversion of stationary and mobile diesel engines to natural gas or electric motors also serves to reduce CO₂ emissions.

- **Transportation Choices Program:** In partnership with San Luis Obispo Regional Rideshare, Ride-On, and SLOAPCD, the Transportation Choices Program (TCP) is a free program offered to businesses and organizations throughout San Luis Obispo County to reduce employee and student commute trips and promote the use of alternative transportation.
- **Pollution Prevention:** The Pollution Prevention Program promotes the use of, and publicly recognizes small businesses which successfully employ, pollution prevention and emission reduction techniques as part of routine operating procedures. Many of the businesses so recognized have incorporated operational changes that reduce their emissions through efficiency improvements that also reduce fuel and product use and save energy.
- **Public Outreach:** SLOAPCD implements a number of outreach campaigns to promote a variety of clean air programs, including backyard burning reduction programs, clean car awareness, pollution prevention, energy efficiency, and transportation alternatives, all of which promote community consciousness and lifestyle choices that can help reduce our impacts on climate change.”

San Luis Obispo County EnergyWise Plan (Climate Action Plan)

The County has prepared a Draft EnergyWise Plan (Climate Action Plan) – Designing Energy and Climate Solutions for the Future. This plan identifies strategies to reduce the county’s GHG emissions by 15% below the baseline year of 2006 by the year 2020. This goal is consistent with AB 32. The plan includes the following:

- Scientific and regulatory framework for addressing climate change and GHGs at the local level.
- Identifies sources of GHG emissions from sources within the unincorporated county and estimates how these emissions may change over time.
- Forecasts emissions to reflect the County’s desired growth projections without regulatory or technical intervention to reduce GHG emissions and provides an emissions reduction target consistent with AB 32 and the County’s General Plan.
- Provides energy use, transportation, land use, water use, and solid waste strategies to reduce San Luis Obispo County’s GHG emissions and quantifies the potential emissions reductions that will be achieved by implementing each strategy.
- Identifies existing and proposed strategies to reduce emissions from County operations and facilities.
- Addresses adaptation to climate change - climate adaptation is an adjustment in natural or human systems in response to actual or expected climatic change and its effects.
- Presents an implementation program to assist with monitoring and prioritization of the reduction strategies through 2020.

4.13.3 Thresholds of Significance

No formal statewide or local guidance currently exists for determining climate change thresholds of significance for large projects such as the one proposed. There is no legally adopted threshold for what emission levels constitute a significant amount. Information is being evaluated at the state and local level in response to the serious threat of climate change effects and subsequent legislation. There is some developing guidance, and this is discussed below.

According to draft California Air Pollution Control Officers Association (CAPCOA) guidance (*CEQA & Climate Change Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, January 2008), a reasonable significance threshold could be a 900 tons per year emissions increase compared to “business as usual” levels. The project’s climate impact would be significant if this goal is not met. This 900 ton level would capture approximately 90% or more of expected new projects and require mitigation. This allows small projects to go forward without onerous conditions.

The ARB has surveyed large industrial sources such as oil refineries, cement plants, and electricity generating facilities and found that a reporting threshold of 25,000 tons per year would capture 90% or more of them. The control measures aimed at these sources would have the greatest impact while not being onerous to small operations. Alternatively, a 10,000 metric tons (11,000 tons) threshold has been proposed by the Market Advisory Committee for a Cap and Trade program.

AB 32 requires state agencies to take actions that will reduce 2020 GHG emissions to those of 1990, and then substantially further reduce emissions by 2050. To achieve the intermediate goal of 2020, it seems reasonable for existing projects that may result in substantial GHG emissions, such as at the level of a landfill, to be held to a net increase of zero new emissions.

4.13.3.1 California Environmental Quality Act Guidelines

Appendix G of the CEQA Guidelines provides the following thresholds for determining significance with respect to greenhouse gas emissions. Impacts would be considered significant if the proposed project would:

1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
2. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

4.13.4 Impact Assessment and Methodology

Long-term operational emissions of CO₂ were calculated by use of the URBEMIS air quality modeling program. Due to the programmatic nature of the project, and lack of grading plans and predicted construction schedule(s) for project actions, short-term construction impacts are qualitatively assessed. The proposed project was evaluated for consistency with measures identified by the SLOAPCD to address GHG emissions.

4.13.5 Project-specific Impacts and Mitigation Measures

4.13.5.1 Generation of GHG Emissions

GHG emissions directly generated during construction of the project will be a short-term increase. As noted in Section 4.2, Air Quality, operation of the project would exceed combined ROG and NO_x thresholds. Estimated CO₂ emissions would be 6,766.52 lbs/day during construction, and 14,118.65 lbs/day (or 34.91 tons per year) during operation. Mitigation is identified to reduce operational emissions for these precursors to ozone, including energy efficiency measures, use of landscaping to minimize energy use for heating and cooling, use of green building materials, and incorporation of engineering and design (i.e., insulation, windows, lighting) to minimize energy demand (AQ/mm-2).

In addition, the project includes several actions that would reduce regional generation of GHG emissions, including improved safe alternative access to the park, including safer pedestrian and bicycle crossings, and improvements to existing public facilities within an urban area. Based on the size and location of the proposed project, this impact would be *less than significant* (Class III).

4.13.5.2 Conflict with Plans and Policies

The project will not conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions. Air quality, energy efficiency, and water conservation measures are identified to mitigate identified impacts; implementation of these measures would also reduce operational GHG emissions. In addition, the project would be consistent with goals to reduce vehicle miles traveled by providing recreational opportunities and alternative transportation linkage within an urban area, and in close proximity to residential areas, and by promoting walking and bicycling by improving safe access into the park and providing path linkages to bike paths and sidewalks.

4.13.6 Cumulative Impacts

No single project is considered large enough to individually affect climate change. GHG impacts, including those described above, all contribute cumulatively with those produced worldwide, to affect climate change. Compliance with identified air quality, energy efficiency, and water conservation mitigation measures would reduce the project's contribution to cumulative GHG emissions, and subsequent climate change. Cumulative effects would be *less than significant* (Class III).

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