

3.2.4 GREENHOUSE GASSES AND CLIMATE CHANGE

ENVIRONMENTAL SETTING

Greenhouse Gases and Climate Change Linkages

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO₂), methane (CH₄), ozone (O₃), water vapor, nitrous oxide (N₂O), and chlorofluorocarbons (CFCs).

Human-caused emissions of these GHGs, in excess of natural ambient concentrations, are responsible for enhancing the greenhouse effect (Ahrens 2003). Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors (California Energy Commission 2006a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (California Energy Commission 2006a).

As the name implies, global climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern, respectively. California produced 492 million gross metric tons of carbon dioxide equivalents in 2004 (California Energy Commission 2006a).

Carbon dioxide equivalents are a measurement used to account for the fact that different GHGs have different potential to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. This potential, known as the global warming potential of a GHG, is also dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO₂ were being emitted.

Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7% of total GHG emissions in the state (California Energy Commission 2006a). This category was followed by the electric power sector (including both in-state and out of-state sources) (22.2%) and the industrial sector (20.5%) (California Energy Commission 2006a).

Effects of Global Climate Change

The effects of increasing global temperature are far reaching and extremely difficult to quantify. The scientific community continues to study the effects of global climate change. In general, increases in the ambient global temperature as a result of increased GHGs are anticipated to result in rising sea levels, which could threaten coastal areas through accelerated coastal erosion, threats to levees and inland water systems and disruption to coastal wetlands and habitat.

If the temperature of the ocean warms, it is anticipated that the winter snow season would be shortened. Snowpack in the Sierra Nevada provides both water supply (runoff) and storage (within the snowpack before melting), which is a major source of supply for the state. According to a California Energy Commission report, the snowpack portion of the supply could potentially decline by 70% to 90% by the end of the 21st century (CEC 2006c). This phenomenon could lead to significant challenges securing an adequate water supply for a growing state population. Further, the increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's levee/flood control system.

Sea level has risen approximately seven inches during the last century and, according to the CEC report, it is predicted to rise an additional 22 to 35 inches by 2100, depending on the future GHG emissions levels (CEC 2006c). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion and disruption of wetlands (CEC 2006c). As the existing climate throughout California changes over time, mass migration of species, or failure of species to migrate in time to adapt to the perturbations in climate, could also result. Under the emissions scenarios of the Climate Scenarios report (California Climate Change Center 2006), the impacts of global warming in California are anticipated to include, but are not limited to, the following.

PUBLIC HEALTH

Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation are projected to increase from 25% to 35% under the lower warming range and to 75% to 85% under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55% more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures will increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

WATER RESOURCES

A vast network of man-made reservoirs and aqueducts capture and transport water throughout the state from northern California rivers and the Colorado River. The current distribution system relies on Sierra Nevada snow pack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snow pack, increasing the risk of summer water shortages.

The state's water supplies are also at risk from rising sea levels. An influx of saltwater would degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta, a major state fresh water supply. Global warming is also projected to seriously affect agricultural areas, with California farmers projected to lose as much as 25% of the water supply they need; decrease the potential for hydropower production within the state (although the effects on hydropower are uncertain); and seriously harm winter tourism. Under the lower warming range, the snow dependent winter recreational season at lower elevations could be reduced by as much as one month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing, snowboarding, and other snow dependent recreational activities.

If GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snow pack by as much as 70% to 90%. Under the lower warming scenario, snow pack losses are expected to be only half as large as those expected if temperatures were to rise to the higher warming range. How much snow pack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snow pack would pose challenges to water managers, hamper hydropower generation, and nearly eliminate all skiing and other snow-related recreational activities.

AGRICULTURE

Increased GHG emissions are expected to cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. Although higher carbon dioxide levels can stimulate plant production and increase plant water-use efficiency, California's farmers will face greater water demand for crops and a less reliable water supply as temperatures rise.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures are likely to worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts, and milk.

Crop growth and development will be affected, as will the intensity and frequency of pest and disease outbreaks. Rising temperatures will likely aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

In addition, continued global warming will likely shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion is expected in many species while range contractions are less likely in rapidly evolving species with significant populations already established. Should range contractions occur, it is likely that new or different weed species will fill the emerging gaps. Continued global warming is also likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

FORESTS AND LANDSCAPES

Global warming is expected to alter the distribution and character of natural vegetation thereby resulting in a possible increased risk of large wildfires. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55%, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. For example, if precipitation increases as temperatures rise, wildfires in southern California are expected to increase by approximately 30% toward the end of the century. In contrast, precipitation decreases could increase wildfires in northern California by up to 90%.

Moreover, continued global warming will alter natural ecosystems and biological diversity within the state. For example, alpine and sub-alpine ecosystems are expected to decline by as much as 60% to 80% by the end of the century as a result of increasing temperatures. The productivity of the state's forests is also expected to decrease as a result of global warming.

RISING SEA LEVELS

Rising sea levels, more intense coastal storms, and warmer water temperatures will increasingly threaten the state's coastal regions. Under the higher warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate coastal areas with saltwater, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

REGULATORY SETTING

Federal

The Environmental Protection Agency (EPA) is the federal agency responsible for implementing the Clean Air Act (CAA). The Supreme Court of the United States ruled on April 2, 2007 that CO₂ is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. In response to the mounting issue of climate change, EPA has taken actions to regulate, monitor, and potentially reduce GHG emissions.

GREENHOUSE GAS PERMITTING REQUIREMENTS ON LARGE INDUSTRIAL FACILITIES

On May 13, 2010, EPA issued the Prevention of Significant Deterioration and Title V Greenhouse Gas Tailor Rule. This final rule sets thresholds for greenhouse gas (GHG) emissions that define when permits under the New Source Review Prevention of Significant Deterioration (PSD) and Title V Operating Permit programs are required for new and existing industrial facilities.

The rule establishes a schedule that will initially focus permitting programs on the largest sources and then expands beyond certain permitting programs to cover the largest sources of GHG that may not have been previously covered by the CAA for other pollutants. During Step 1, from January 2, 2011 to June 30, 2011, only sources currently subject to the PSD permitting program (i.e., those that are newly-constructed or modified in a way that significantly increases emissions of a pollutant other than GHGs) would be subject to permitting requirements for their GHG emissions under PSD; and, for these projects, only GHG increases of 75,000 tons (68,039 MT) per year or more, on a CO_{2e} basis, would need to determine the Best Available Control Technology (BACT) for their GHG emissions. Similarly for the operating permit program, only sources currently subject to the program (i.e., newly constructed or existing major sources for a pollutant other than GHGs) would be subject to Title V requirements for GHG. During this time, no sources would be subject to Clean Air Act permitting requirements due solely to GHG emissions.

Step 2 will build on Step 1. During Step 2, from July 1, 2011 to June 30, 2013, PSD permitting requirements will cover for the first time new construction projects that emit GHG emissions of at least 100,000 tons (90,718 MT) per year even if they do not exceed the permitting thresholds for any other pollutant. Modifications at existing facilities that increase GHG emissions by at least 75,000 tons (68,039 MT) per year will be subject to permitting requirements, even if they do not significantly increase emissions of any other pollutant. In Step 2, operating permit requirements will, for the first time, apply to sources based on their GHG emissions even if they would not apply based on emissions of any other pollutant. Facilities that emit at least 100,000 tons (90,718 MT) per year of CO_{2e} will be subject to Title V permitting requirements.

As part of this rule, EPA also commits to undertake another rulemaking, to begin in 2011 and conclude no later than July 1, 2012. That action will consist of an additional Step 3 for phasing in GHG permitting. Step three, if established, will not require permitting for sources with greenhouse gas emissions below 50,000 tons (45,359 MT) per year.

As a stationary source, the proposed Cogen Facility would emit more than 100,000 tons of CO_{2e} per year, which falls within the PSD permitting requirements described above. However, in early 2011, the EPA granted a three-year exemption from this rule for large-scale biomass-burning facilities. At the time of writing of this document, the three-year biomass exemption is in effect. However, this EPA ruling to exempt biomass has been challenged by environmental groups. Given the uncertainties related to when the proposed project will be constructed and operational, and whether or not legal challenges to the EPA's biomass exemption will be successful, it is not known whether or not the proposed Cogen Facility will be required to determine and implement BACT for GHGs under the PSD program.

MANDATORY GREENHOUSE GAS REPORTING RULE

On September 22, 2009, EPA issued a final rule for mandatory reporting of GHGs from large GHG

emissions sources in the United States. In general, this national reporting requirement will provide EPA with accurate and timely GHG emissions data from facilities that emit 25,000 metric tons or more of CO₂ per year. This publically available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost effective opportunities to reduce emissions in the future. Reporting is at the facility level, except that certain suppliers of fossil fuels and industrial greenhouse gases along with vehicle and engine manufacturers will report at the corporate level. An estimated 85% of the total U.S. GHG emissions, from approximately 10,000 facilities, are covered by this final rule. The proposed Cogen Facility will be subject to the GHG reporting requirements established by this rule.

ENERGY POLICY AND CONSERVATION ACT

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the United States (U.S.). Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards.

Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by the U.S. Environmental Protection Agency (EPA), was created to determine vehicle manufacturers' compliance with the fuel economy standards. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

ENERGY POLICY ACT OF 1992 (EPACT)

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

ENERGY POLICY ACT OF 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as

landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for a clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

State

CALIFORNIA STRATEGY TO REDUCE PETROLEUM DEPENDENCE (AB 2076)

AB 2076 (Chapter 936, Statutes of 2000) requires the CEC and the ARB to develop and submit to the Legislature a strategy to reduce petroleum dependence in California. The statute requires the strategy to include goals for reducing the rate of growth in the demand for petroleum fuels. In addition, the strategy is required to include recommendations to increase transportation energy efficiency as well as the use of non-petroleum fuels and advanced transportation technologies including alternative fuel vehicles, hybrid vehicles, and high-fuel efficiency vehicles.

The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and CARB in 2003. The strategy recommends that California reduce inroad gasoline and diesel fuel demand to 15% below 2003 demand levels by 2020 and maintain that level for the foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles (SUVs); and increase the use of non-petroleum fuels to 20% of on-road fuel consumption by 2020 and 30% by 2030.

BIOENERGY ACTION PLAN – EXECUTIVE ORDER #S-06-06

Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20% of its biofuels within California by 2010, 40% by 2020, and 75% by 2050. The executive order also calls for the state to meet a target for use of biomass electricity, including biomass cogeneration facilities.

GOVERNOR'S LOW CARBON FUEL STANDARD (EXECUTIVE ORDER #S-01-07)

Executive Order #S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020 through establishment of a Low Carbon Fuel Standard. The Low Carbon Fuel Standard shall be incorporated into the State Alternative Fuels Plan required by AB 1007 and is one of the proposed discrete early action GHG reduction measures identified by CARB pursuant to AB 32.

SENATE BILL 97 (SB 97)

Senate Bill 97 was signed by the Governor on August 24, 2007. This bill would provide that in an environmental impact report, negative declaration, mitigated negative declaration, or other document required by CEQA for either transportation projects funded under the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or projects funded under the Disaster Preparedness and Flood Prevention Bond Act of 2006, the failure to analyze adequately

the effects of greenhouse gas emissions otherwise required to be reduced pursuant to regulations adopted under the Global Warming Solutions Act of 2006 does not create a cause of action for a violation of CEQA. The bill would provide that this provision shall apply retroactively for any of the above documents that are not final and shall be repealed on January 1, 2010.

The bill would require the Office of Planning and Research (OPR), by July 1, 2009, to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency would be required to certify and adopt those guidelines by January 1, 2010. The OPR would be required to periodically update the guidelines to incorporate new information or criteria established by the CARB pursuant to the California Global Warming Solutions Act of 2006.

CLIMATE ACTION PROGRAM AT CALTRANS

In December 2006, the California Department of Transportation, Business, Transportation, and Housing Agency, issued a Climate Action Program. The goal of the Climate Action Program is to promote clean and energy efficient transportation, and provide guidance for mainstreaming energy and climate change issues into business operations. The overall approach to lower fuel consumption and CO₂ from transportation is twofold: (1) reduce congestion and improve efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems; and (2) institutionalize energy efficiency and GHG emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

The reasoning underlying the Climate Action Program is the conclusion that “the most effective approach to addressing GHG reduction, in the short-to-medium term, is strong technology policy and market mechanisms to encourage innovations. Rapid development and availability of alternative fuels and vehicles, increased efficiency in new cars and trucks (light and heavy duty), and super clean fuels are the most direct approach to reducing GHG emissions from motor vehicles (emission performance standards and fuel or carbon performance standards).”

SENATE BILL 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets, land use, and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO’s Regional Transportation Plan (RTP). 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 8 years, but can be updated every 4 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 emission reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012. The ARB assigned the Shasta

County Regional Transportation Planning Agency (Shasta RTPA) with a reduction target of 0% per capita GHG emissions from 2005 levels.

ASSEMBLY BILL 1493

In 2002, then Governor Gray Davis signed AB 1493. AB 1493 required the CARB to develop and adopt, by January 1, 2005, regulations that achieve “the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the ARB to be vehicles whose primary use is noncommercial personal transportation in the state.” To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California’s existing motor vehicle emission standards in 2004.

Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961), and adoption of Section 1961.1 (CCR 13 1961.1) require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016. For passenger cars and light-duty trucks 3,750 pounds or less loaded vehicle weight (LVW), the 2016 GHG emission limits are approximately 37% lower than the during the first year of the regulations in 2009. For medium-duty passenger vehicles and light-duty trucks 3,751 LVW to 8,500 pounds gross vehicle weight (GVW), GHG emissions are reduced approximately 24% between 2009 and 2016.

In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufactures filed suit against the CARB to prevent enforcement of CCR 13 1900 and CCR 13 1961 as amended by AB 1493 and CCR 13 1961.1 (Central Valley Chrysler-Jeep et al., v. Catherine E. Witherspoon, in her official capacity as Executive Director of the California Air Resources Board et al.). The suit, being heard in the U.S. District Court for the Eastern District of California, contends that California’s implementation of regulations that in effect regulate vehicle fuel economy violates various federal laws, regulations, and policies. To date, the suit has not been settled, and the judge has issued an injunction stating CARB cannot enforce the regulations in question before receiving appropriate authorization from the EPA.

CALIFORNIA EXECUTIVE ORDERS S-3-05 AND S-20-06, AND ASSEMBLY BILL 32

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California’s GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by 2020 and 3) 80% below the 1990 levels by 2050.

In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that ARB create a plan, which includes market mechanisms, and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state’s Climate Action Team (CAT). Each CAT working group will

develop a Near-term Implementation Plan (CATNIPs) for the specific climate change mitigation measures and adaptation strategies being addressed by the working group. These will be the measures and strategies that will be underway or completed by the end of 2010. The CATNIP will include a brief description of the measures and strategies, the steps to be taken in implementation, the agency/department responsible, and the timeline for completion. The Energy Working Group of the Climate Action Team focuses its efforts on both green house gas emission reduction and adaptation actions affecting the energy sector.

CARB, which is part of Cal-EPA, develops air quality regulations at the state level. The state regulations mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. California also requires areas to develop plans and strategies for attaining state ambient air quality standards as set forth in the California Clean Air Act of 1988. In addition to developing regulations, CARB develops motor vehicle emission standards for California vehicles.

ASSEMBLY BILL 32- CLIMATE CHANGE SCOPING PLAN

On December 11, 2008 ARB adopted its *Climate Change Scoping Plan* (Scoping Plan), which functions as a roadmap of ARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. The Scoping Plan contains the main strategies California will implement to reduce CO₂e emissions by 169 million metric tons (MMT), or approximately 30%, from the state's projected 2020 emissions level of 596 MMT of CO₂e under a business-as-usual scenario. (This is a reduction of 42 MMT CO₂e, or almost 10%, from 2002–2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.) The Scoping Plan also 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 CO₂e),
- 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 Cal-EPA 2011 Greenhouse Gas Reduction Report Card (January, 2011) reported that in 2009, the date for which the most current data are available, California had achieved a reduction of 1.3 MMT CO₂e compared to 2007 levels from implementation of the RPS program.

SENATE BILL 1368

SB 1368 requires the California Energy Commission (CEC) and the California Public Utilities Commission (CPUC) to set a global warming emissions standard for electricity used in California — regardless of whether it's generated in-state or purchased from plants in other states. The new standard applies to any new long-term financial contracts for base load electricity, and applies both to investor-owned utilities and municipal utilities. The standard for baseload generation owned by, or under long-term contract to publicly owned utilities, is an emissions performance standard (EPS) of 1,100 lbs CO₂ per megawatt-hour (MWh). However, the CPUC has determined that biomass generation of electricity is EPS compliant because alternative means of disposing biomass such as open air burning and landfill deposition have the potential to generate greater concentrations of greenhouse gas in the atmosphere, including methane. This concept is described in greater detail under the impact analysis below.

SENATE BILLS 1078 AND 107 AND EXECUTIVE ORDER S-14-08

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Energy Standard to 33% renewable power by 2020.

CALIFORNIA RENEWABLES PORTFOLIO STANDARD (RPS)

Established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires electric corporations to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually, until they reach 20% by 2010. Biomass generated electricity is considered an eligible renewable energy source for the RPS program.

ANALYSIS METHODOLOGY

At the time of preparation of this Recirculated Draft EIR, neither CARB nor the Shasta County Air Quality Management District has formally adopted a recommended methodology for evaluating GHG emissions associated with stationary sources and/or new projects.

The California Office of Planning and Research's (OPR) recommends that lead agencies under CEQA make a good-faith effort, based on available information, to estimate the quantity of GHG emissions that would be generated by a proposed project, including the emissions associated with construction activities, stationary sources, vehicular traffic, and energy consumption: to determine whether the impacts have the potential to result in a significant project or cumulative environmental impact; and, where feasible mitigation is available, to mitigate any project or cumulative impact determined to be potentially significant. More recently, OPR prepared amendments to the State CEQA Guidelines, pursuant to SB 97 (Statutes of 2007) for adoption by the California Natural Resources Agency. The amendments added several provisions reinforcing

the requirements to assess a project's GHG emissions as a contribution to the cumulative impact of climate change. The amendments went into effect on March 18, 2010.

Specifically, CEQA Guidelines Section 15064.4, as amended March 18, 2010, state:

(a) The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in section 15064. A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

(1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or

(2) Rely on a qualitative analysis or performance based standards.

(b) A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Analysis Approach

The proposed SPI Anderson Cogen Facility was analyzed for potential GHG emissions. Table 3.2.4-1 summarizes the proposed biomass project-related activities for which the GHG emissions were estimated, the key input parameters, and the source of the emission factors to be used. The operational emissions are principally the GHG emissions from the combustion of biomass in the facility (the stationary source) plus there are numerous support emissions, which are emissions that directly support power plant operations and would not otherwise occur. Avoided emissions are those GHG emissions that would no longer occur due to operation of the proposed Cogen Facility.

TABLE 3.2.4-1 METHODOLOGIES USED TO ESTIMATE GHG EMISSIONS FOR PROJECT

SOURCE OF GHG	KEY INPUT PARAMETER	GHG EMISSION FACTORS MODELS AND SOURCES
OPERATIONAL EMISSIONS		
Biomass Combustion at Power Plant	Biomass fuel energy content	CARB Mandatory Reporting of GHG Emissions regulations (Title 17 §§95100 to 95133)
Natural Gas Combustion at Power Plant	Natural gas energy content	CARB Mandatory Reporting of GHG Emissions regulations (Title 17 §§95100 to 95133)
Fuel Yard Loader	Hours of off-road equipment use	CARB Offroad2007, CA Climate Action Registry General Reporting Protocol 2009
Truck Idling at Power Plant	Truck idling hours	CARB Emfac2007, CA Climate Action Registry General Reporting Protocol 2009
Employee trips	VMT of employee commute trips	CARB URBEMIS, CA Climate Action Registry General Reporting Protocol 2009
Biomass Hauling	VMT of haul routes	CA Climate Action Registry General Reporting Protocol 2009, CARB EMFAC2007
Hauling of Ash	VMT of haul routes	CA Climate Action Registry General Reporting Protocol 2009
Biomass Harvesting/Processing	On-road vehicle miles traveled (VMT) and hours of off-road equipment use	CARB Offroad2007, Forest Biomass Removal on National Forest Lands (Sierra Nevada Conservancy, November 2008)
AVOIDED EMISSIONS		
Decomposition of Urban Wood Waste	Mass of biomass decomposed	IPCC National Inventory Guidelines, Volume 5
Agricultural Woody Waste Burning	Mass of biomass burned	IPCC National Inventory Guidelines, Volume 4
Forest Thinnings/Slash Burning	Mass of biomass burned	IPCC National Inventory Guidelines, Volume 4

NOTES: IPCC IS THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

The methodology used to analyze the project’s contribution to global climate change includes the calculation of GHG emissions using the best available methodologies and specified GHG emission factors available from a variety of models, protocols, and regulatory sources (as listed in Table 3.2.4-1) and the GHG Analysis supporting Excel spreadsheets, which are included as Appendix B. As examples, GHG emission factors for the calculation of total GHG emissions from the combustion of biomass were sourced from the California Code of Regulations, and the equations used in the GHG analysis were obtained from published California Air Resources Board (CARB) guidance documents. In the avoided emissions calculations for forest thinning and harvesting residues, emissions factors were sourced from IPCC protocols, and equations for the

calculation of the total also sourced from IPCC protocols. For the processing of forest residues by off-road equipment, GHG emission factors were obtained via the CARB OFFROAD2007 model. These models and protocols represent established standards used by California regulatory agencies and the scientific community. The analysis was prepared by TSS Consultants, Inc., a professional firm with extensive experience quantifying GHG impacts associated with biomass power plant operations.

THRESHOLDS OF SIGNIFICANCE

As described previously, the State Legislature and the global scientific community have found that global climate change poses significant adverse effects to the environment of California and the entire world.

Per Appendix G of the CEQA Guidelines, climate change-related impacts are considered significant if implementation of the proposed project under consideration would do any of the following:

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.

Very few public agencies in California have adopted GHG thresholds of significance for CEQA, and no GHG thresholds have been developed specifically for facilities that generate electricity. Neither the Shasta County Air Quality Management District nor Shasta County has developed thresholds. Some agencies have adopted thresholds of significance for stationary-source GHGs that focus on the mass emissions of a project. When using a mass emissions approach, in general the larger the project, the greater the potential that project-generated GHG emissions would exceed the threshold of significance. Using a mass emission approach may be appropriate for evaluating stationary sources if no GHG policies, goals, or regulations have been established that apply to those specific types of stationary sources. Applying this type of approach for the proposed project would overlook the fact that California has determined how (and the degree to which) it will address the sector of GHG emissions associated with electricity production. Indeed, by establishing the 33% Renewable Portfolio Standard, California has established an aggressive goal to shift to renewable energy to substantially reduce GHG emissions. Thus, in this more appropriate context, the larger the renewable electricity project, the closer the state comes to achieving the Renewable Portfolio Standard and associated GHG reductions. Thus, a mass emissions threshold would not be an appropriate metric to determine significance of GHG emissions associated with the proposed project.

Shasta County has determined that the establishment of a numerical threshold of significance is not appropriate for the proposed project. Consistent with the guidance provided in CEQA Guidelines Section 15064.4, Shasta County has prepared this EIR in a manner which includes a detailed quantification of the projected GHG emissions that would result from project implementation, and has established an appropriate threshold of significance, as directed by CEQA Guidelines Section 15064.4(b)(3).

For the purposes of this EIR, a GHG impact would be considered significant if implementation of the proposed project would:

- Conflict with, or impede implementation of, the State's Renewable Energy Standard that aims to have 33% of the State's electricity come from renewable energy sources by 2020; or
- Not assist in meeting the Statewide GHG reduction goals outlined in AB 32.

GHG IMPACTS AND MITIGATION MEASURES

Impact 3.2.4.1: Project implementation would result in the generation of GHG emissions, but would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. (Less than significant impact)

The analysis of this impact includes two primary areas of focus. The first area of focus in this impact analysis is the quantification and disclosure of the anticipated GHG emissions that would result from construction and operation of the proposed project. GHGs are quantified in order to show the extent to which the proposed project may increase GHGs as compared to the existing environmental setting.

The second area of focus is the project's consistency with applicable statewide regulations and programs adopted to achieve statewide reductions in GHG emissions. These regulations and programs include AB 32, the AB 32 Scoping Plan and the Renewables Portfolio Standard.

As described previously in this section, a numerical threshold of significance for GHG emissions has not been established by Shasta County. Rather, Shasta County has determined that the appropriate threshold of significance for this project is consistency with applicable regulations and programs, including AB 32, the AB 32 Scoping Plan and the Renewables Portfolio Standard.

GHG EMISSIONS QUANTIFICATION

CONSTRUCTION-RELATED GHG EMISSIONS

Project-related construction activities would result in increased GHG emissions. Heavy-duty off-road equipment, materials transport, and worker commutes during construction of the proposed project would result in exhaust emissions of GHGs. GHG emissions generated by construction would be primarily in the form of CO₂. Although emissions of other GHGs, such as CH₄ and N₂O, are important with respect to global climate change, the emission levels of these other GHGs from on- and off-road vehicles used during construction are relatively small compared with CO₂ emissions, even when factoring in the relatively larger global warming potential of CH₄ and N₂O.

The estimated construction GHG emissions are presented below in Table 3.2.4-2.

TABLE 3.2.4-2: CONSTRUCTION GREENHOUSE GASES

GREENHOUSE GAS	UNMITIGATED EMISSIONS (TONS/YEAR)
Carbon dioxide	120.29

SOURCE: DE NOVO PLANNING GROUP, 2010 (URBEMIS 2007 MODELING)

Information and Methodology used for Analysis of Operational Emissions

Biomass Combustion at Power Plant

The proposed Cogen Facility is to produce 31 MW (gross) of electrical power by consuming 220,000 bone dry tons (BDT) of woody biomass gathered from a variety of sources. Based on information supplied by the project applicant, there were different estimates of the project's biomass fuel blend by fuel type. One estimate assumed that the entire project (100%) could be fueled by mill residuals from the SPI Anderson and the SPI Shasta Lake sawmill operations. It is reported that the SPI Anderson Sawmill facility has the capability to provide sixty-five percent (65%) of the fuel requirements of the proposed biomass facility by using 100% of the SPI Anderson mill residuals. The remaining 35% of the annual biomass needed can be mill residuals from the SPI Shasta Lake Sawmill facility, located eighteen (18) miles north of the SPI Anderson facility. An alternative fuel type mix was, however, used for this GHG analysis, in order to present a more likely, average, fuel mix over the life of the facility. It assumes that not all the woody biomass for fuel comes from mill residues, but also may come from forest harvesting operations (as harvest slash), forest thinning operations (to reduce wildfire hazards), agricultural woody waste from the Sacramento Valley agricultural areas, and some urban wood waste. The mix of biomass fuel types is presented in Table 3.2.4-3 below.

TABLE 3.2.4-3: REPRESENTATIVE WOODY BIOMASS FUEL MIX OF PROJECT

ANNUAL FUEL USE	MILL	HARVEST SLASH	THINNINGS	AGRICULTURE	URBAN WOOD	TOTAL
BDT per year	140,000	20,000	20,000	25,000	15,000	220,000
Percentage of BDT	64%	9%	9%	11%	7%	100%

It should be noted though, that in the calculation of total potential GHG emissions from the combustion of the woody biomass, it is the total of 220,000 BDT that was used, as the location of where it came from for this calculation does not affect the total GHG emissions of the woody biomass. The fuel type mix does have effects on other portions of the GHG analysis as explained below.

Natural Gas Combustion at the Power Plant

The proposed project will utilize natural gas during start up and shut down activities, as well as for flame stabilization. The Cogen Facility boiler will be equipped with two (2) natural gas burners, each with a maximum rated heat input of 62.5 MMBtu/hours. The air quality permit for the facility has not yet been issued, but may have the maximum annual natural gas usage set at 10% of the burner annual capacity factor. This would mean that that the natural gas burners could

operate at nearly 3,000 hours per year. However, it is expected that the actual usage will be considerably less than this. Thus, for the purposes of GHG emissions calculations, the natural gas usage was set at 500 hours of the two burners operating. The assumption of 500 hours per year of burner operation is based on a review of the operational characteristics of similar facilities in Shasta County, discussions with Shasta AQMD staff, and professional knowledge of biomass facility operations. This assumption is likely an overestimate of actual burner operations on an annual basis, and is considered a very conservative estimate for use in this quantification.

It should be noted that these GHG emissions will be additive to the biomass GHG emissions.

Fuel Yard Loader

The GHG emissions of the fuel yard equipment are included in the operational GHG emissions inventory. The equipment proposed for use in the woody biomass fuel yards is a Caterpillar 980B Front End Bucket Loader. Proposed operational parameters are: Operating 16 hours per day, at six days a week would equal 112 hour/week, or a total of 5,284 hours per year.

Truck Idling

Woody biomass from the forest, agriculture, and urban sources, as well as a portion of the mill residuals coming from other SPI facilities will require that the chip van trucks may idle at the facility while waiting to off load woody biomass fuel. The idling time for each truck was assumed to be 15 minutes. Ash hauling trucks were also included in this GHG emissions calculation.

Employee Trips

The SPI Anderson Cogen Facility project will increase the number of employees by six. Thus, the GHG emissions for six new employees and their commute to and from the facility were calculated. Average trip length defaults were obtained from the CARB approved emissions models as well as average mix of vehicle types that might be used by the new, additional, employees.

Biomass Hauling

Woody biomass delivered from the variety of off-site sources, including mill residuals from other SPI facilities involve the use of truck and chip trailers combinations. Based upon biomass fuel source data supplied from SPI, via the County of Shasta, the average amount of miles traveled by the chip trucks was calculated for the following off-site biomass fuel sources. Included is the calculated amount of fuel from these sources as well:

Mill Residues

- SPI Shasta Lake - 30,135 BDT @ 18 miles
- SPI Red Bluff - 15,043 BDT @ 26 miles
- SPI Arcata - 3,724 BDT @ 155 miles

Forest Thinnings and Slash

- Various locations - 40,000 BDT @ 68 miles

Agricultural Woody Waste

- Sacramento Valley various locations - 25,000 BDT @ 108 miles

Urban Wood Waste

- Sacramento urban area - 15,000 BDT @ 152 miles

The total miles that the chip trucks would travel (round trips) was calculated and then divided by 13.5, this being the average BDT of woody biomass per delivery truck. GHG emissions factor for heavy-duty diesel trucks were then applied and the total GHG emissions burden for diesel fuel consumed by the trucks was calculated.

Hauling of Ash

For the purposes of this GHG emissions calculation it was assumed that all the ash would be transported to the Anderson Landfill for disposal (approximately 7.2 miles away). An ash hauling truck was assumed to hold 18 tons, and with a projected annual generation of 11,155 tons of ash, it is calculated that there will be 1,248 trips to the landfill. Again, assuming the truck hauling the ash would be a heavy-duty diesel, the GHG emissions for the diesel fuel consumed was calculated.

Biomass Harvesting and Processing

The fuel types that will require harvesting, collection, and processing that contribute to the project's GHG emissions burden include the forest thinnings and slash, agricultural woody waste, and urban wood waste. Much of this diesel-fired equipment (such as feller bunchers, grinders, etc.) is off-road diesel equipment. There are some on-road vehicles associated with the forest thinnings/slash and agricultural woody waste that was also used in GHG emissions calculations.

Information and Methodology used for Analysis of Avoided Emissions

The term "avoided emissions" refers to emission that would otherwise occur if the proposed project were not implemented. For example, as described in greater detail below and in the Project Description section of this EIR, many agricultural operations yield woody waste, often in the form of orchard trimmings and removed trees. Much of this agricultural woody waste is currently disposed of through open burning. By utilizing this agricultural woody waste as fuel for the Cogen Facility, the emissions associated with the open burning of this fuel would not occur. Combustion of these materials in the Cogen Facility would result in emissions. These emissions are shown in Table 3.2.4-4 as Biomass Combustion Emissions.

Decomposition of Urban Wood Waste

The principal alternative fate of urban wood waste, if not used for biomass power generation is that it is chipped and used as either mulch (landscaping application), soil amendment in a compost facility, or as alternative daily cover at landfills. It is assumed for the purposes of this GHG analysis that all urban wood waste destined for the proposed SPI Anderson Cogen Facility will come from the Sacramento urban area. Solid waste diversion requirements in the Sacramento area prevent the direct disposal of urban wood waste into landfills. Therefore, all 15,000 BDT of urban wood waste, if not used for biomass power generation, is expected to be composted or decompose in some way. GHG emissions are avoided as the biomass power from the urban wood wastes produced can offset the use of fossil fuels for electricity generation.

It is also further assumed in the calculation of GHG emissions for the decomposing of the urban wood waste that approximately 50% of the CO₂ emissions would be released. The other 50% of the degradable organic carbon would be sequestered into the soil or finished compost.

Agricultural Woody Waste Burning

The diversion of agricultural woody waste from open field burning to the Cogen Facility results in an avoided emissions of GHG, even though the combustion of biomass results in its own GHG emissions. GHG emissions are avoided as the biomass power from the agricultural woody wastes produced can offset the use of fossil fuels for electricity generation. It is assumed that approximately 95% of the agriculture woody waste burned in the field releases its full GHG emissions.

Forest Thinning/Slash Burning

Similar to agricultural woody waste, the diversion of forest biomass thinnings and slash from being open pile burned in the forest to the Cogen Facility results in avoided emissions of GHGs, even though the combustion of biomass results in its own GHG emissions. GHG emissions are avoided as the biomass power from the forest wood wastes produced can offset the use of fossil fuels for electricity generation. It is assumed that about 95% of the forest wood waste burned in the field releases its full GHG emissions.

Existing 4 MW Cogeneration Facility

Sierra Pacific Industries currently operates a 4 MW-cogeneration facility on the project site. Upon approval and completion of the proposed Cogen Facility, the existing 4 MW-cogeneration facility would cease operations. As described in greater detail in the Project Description section of this EIR, the two facilities would never operate simultaneously. The existing 4 MW-facility currently generates GHGs. These GHGs will not be generated once the proposed Cogen Facility is operational, thus, these are also avoided emissions.

Analysis Results

Table 3.2.4-4 displays the results of the GHG analysis for the operations of the proposed Cogen Facility. Included are the avoided emissions, which results in the net GHG emissions burden of the proposed facility. Detailed calculation worksheets associated with this table are provided in Appendix B.

TABLE 3.2.4-4 GHG EMISSIONS GENERATED AND AVOIDED BY THE PROJECT

SOURCE	CO ₂ E (MT/YEAR)
OPERATIONAL EMISSIONS	
Biomass Combustion at Power Plant	317,497
Natural Gas Combustion at Power Plant	3,419
Fuel Yard Loader	926
Truck Idling at Power Plant	18
Employee Trips	39
Biomass Hauling	1,979
Ash Hauling	26
Biomass Harvesting/Processing	5,944
<i>Subtotal of emissions generated</i>	329,848
AVOIDED EMISSIONS	
Decomposition of Urban Wood Waste	10,586
Agricultural Woody Waste Burning	35,294
Forest Thinning/Slash Burning	62,246
Existing 4 MW Cogeneration Facility	46,181
<i>Subtotal of emissions avoided</i>	154,307
NET INCREASE IN OPERATIONAL EMISSIONS	175,541

SOURCE: TSS CONSULTANTS, AUGUST 2011.

As shown in the table above, operation of the proposed Cogen Facility would result in the net increase of approximately 175,541 metric tons of CO₂e per year. This quantified analysis of GHGs that would be generated by project operations is included in this EIR in order to provide the public, interested agencies, organizations, and County decision makers with information and details regarding projected GHG emissions associated with project operation.

Analysis of Consistency with Adopted State Programs to Reduce GHG Emissions

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order S-3-05. The goal of this Executive Order is to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by the 2020 and 3) 80% below the 1990 levels by the year 2050.

In 2006, this goal was further reinforced with the passage of Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006. AB 32 sets the same overall GHG emissions reduction goals while further mandating that ARB create a plan, which includes market mechanisms, and implement

rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state’s Climate Action Team.

The AB 32 Scoping Plan was developed by ARB as the mechanism, or tool, to achieve the target GHG emissions reductions required by AB 32. The AB 32 Scoping Plan, adopted in December 2008, established the business as usual (BAU) 2020 GHG emissions baseline at 596 million metric tons (MMT) of CO₂e. Since 2008, ARB has updated projected BAU emissions based on current economic forecasts (i.e., as influenced by the economic downturn) and reduction measures already in place. Two new reduction measures [Pavley I and the Renewables Portfolio Standard (12% - 20%)] are incorporated into the updated baseline which, was not included earlier. These measures are expected to reduce the 2020 statewide emissions projection to 507 MMTCO₂e by 2020.¹ The updated forecast of 507 MMT CO₂e is referred to as the AB 32 2020 baseline.

The AB 32 Scoping Plan has established a 2020 GHG emissions target of 427 MMTCO₂e, which is 80 MMTCO₂e below the projected 2020 GHG BAU calculations of 507 MMTCO₂e. Of the 80 MMTCO₂e reduction needed to meet the 2020 GHG emissions target, 21.3 MMTCO₂e are targeted for reductions achieved through the Renewables Portfolio Standard.

Established in 2002 under Senate Bill 1078 and accelerated in 2006 under Senate Bill 107, California's Renewables Portfolio Standard is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities (IOUs), electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources by at least 1% of their retail sales annually, until they reach 20% by 2010. Governor Arnold Schwarzenegger signed Executive Order (EO) S-21-09 on September 15, 2009 directing the California ARB to adopt regulations requiring 33% of electricity sold in the state come from renewable energy by 2020. Governor Schwarzenegger had previously established a 33% state goal in EO S-14-08. The California Public Utilities Commission (CPUC) and the California Energy Commission (CEC) jointly implement the RPS program.

The CEC has determined that it is appropriate to define eligible renewable energy resources by renewable resource or fuel, rather than by the specific technology used.² For certain eligible renewable energy resources, however, the law contains specific requirements, and the Energy Commission must consider both the resource or fuel and the technology to determine RPS eligibility.

¹ California Air Resources Board, Supplement to the AB 32 Scoping Plan Functional Equivalent Document. June 13, 2011. Available at: <http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm>

² California Energy Commission, Commission Guidebook, Renewables Portfolio Standard Eligibility (Fourth Edition). January 2011. Available at: <http://www.energy.ca.gov/renewables/documents/index.html#rps>

To qualify as eligible for California's RPS, a generation facility must use one or more of the following renewable resources or fuels:

- Biodiesel
- Biogas (including pipeline biomethane)
- Biomass
- Conduit hydroelectric
- Digester gas
- Fuel cells using renewable fuels
- Geothermal
- Hydroelectric incremental generation from efficiency improvements
- Landfill gas
- Municipal solid waste
- Ocean wave, ocean thermal, and tidal current
- Photovoltaic
- Small hydroelectric (30 megawatts or less)
- Solar thermal electric
- Wind

The generation from a biomass facility is eligible for the RPS provided the facility uses a "biomass" fuel as defined in the *Overall Program Guidebook*. The CEC defines biomass as: "*any organic material not derived from fossil fuels, including, but not limited to, agricultural crops, agricultural wastes and residues, waste pallets, crates, dunnage, manufacturing, construction wood wastes, landscape and right-of-way tree trimmings, mill residues that result from milling lumber, rangeland maintenance residues, biosolids, sludge derived from organic matter, and wood and wood waste from timbering operations.*"³

As described above, the proposed project would burn biomass that meets the CEC's definition of eligible fuels for RPS certification of the facility.

The CEC maintains a list of facilities currently certified under the RPS program. SPI, the project applicant, has received pre-certification approval from the CEC to register the proposed facility as an renewable energy production facility under the RPS program.⁴ The existing 4MW cogeneration biomass facility located and operational at the project site is currently approved and certified as an

³ California Energy Commission, Commission Guidebook, Renewable Energy Program Overall Program Guidebook (Third Edition). January 2011. Available at: <http://www.energy.ca.gov/renewables/documents/index.html#rps>

⁴ California Energy Commission, California's Renewables Portfolio Standard (RPS) List of Facilities. August 1, 2011. Available at: http://www.energy.ca.gov/portfolio/documents/list_RPS_certified.html

RPS facility. The project applicant also operates several other RPS certified biomass energy facilities throughout California.

In summary, the proposed project has received pre-certification approval as an RPS facility. Implementation of the proposed project will further the goals established through AB 32 and will assist with implementation of the AB 32 Scoping Plan by increasing the availability of certified renewable energy sources in California. The ARB has determined that the AB 32 Scoping Plan, which relies on implementation of the RPS, is the most feasible and aggressive program available to reduce statewide GHG emissions. Energy produced from biomass is a key component of the RPS, and the proposed project will assist in implementing the AB 32 Scoping Plan and RPS through contributing to the State's goal of 33% of California's energy needs coming from renewable sources. Therefore, the proposed project is consistent with the applicable regulations and programs established by the State to reduce GHG emissions. This is a **less than significant impact**, and no mitigation is required.

Impact 3.2.4.2: The effects of global climate change could result in adverse impacts on facility operations and structures. (Less than significant impact)

Recent increases in GHG concentrations in the atmosphere have led to increase average global temperatures (global warming) through the intensification of the greenhouse effect, and associated changes in local, regional, and global average climatic conditions.

Although there is strong scientific consensus that global climate change is occurring and is influenced by human activity, there is less certainty as to the timing, severity, and potential consequences of the climate phenomena. Scientists have identified several ways in which global climate change could alter the physical environment in California.⁵ These include:

- increased average temperatures;
- modifications to the timing, amount, and form (rain vs. snow) of precipitation;
- changes in the timing and amount of runoff;
- reduced water supply;
- deterioration of water quality; and,
- elevated sea levels.

⁵ California Energy Commission, The Future is Now: An Update on Climate Change Science, Impacts, and Response Options for California. May 2009. Available at: http://www.climatechange.ca.gov/publications/biennial_reports/index.html

These changes may translate into a variety of issues and concerns that may affect the project area, including, but not limited to:

- decreased water supply, reliability, and quality;
- increased frequency and intensity of wildfire as a result of changing precipitation patterns and temperatures; and,
- increased risk of flooding and landslides associated with changes to precipitation patterns.

Although uncertainty exists to the precise levels of these impacts, there is consensus regarding the range, frequency, or intensity of these impacts that can be expected. The proposed project could be subject to potential hazards that could be exacerbated by climate change, such as reduced water supply, increased flooding that might prevent haul trucks from accessing the facility, and increased grass or wildland fires from adjacent parcels that are primarily open space and/or used for grazing. Because the project site is located sufficiently far above sea level (more than 430 feet) it is not anticipated that the proposed project would be affected by sea level rise.

Although operation of the biomass facility may result in increased exposure to such hazards, the extent to which the hazards would increase is speculative, and increases in hazard levels would occur over a long time frame (e.g., 100 years or more) compared to the design life of the project (estimated at approximately 30 years). Also, the project would include features that enable it to avoid, adapt to, and be resilient in the face of climate change-associated impacts. These features include:

- Use of non-potable water for operation of the steam turbine and direct reliance on a source of water that appears highly reliable given historical groundwater monitoring of the local aquifer;
- Use of water conservation technologies, including extensive on-site recycled water systems;
- Drainage features for handling storm water runoff on-site during extreme storm events;
- Non-vegetated setbacks between the biomass piles stored in the fuel yard and adjacent parcels that may contain dry vegetation; and
- The existing on-site fire suppression system and available water in the on-site detention ponds.

Inclusion of these features in the design and operation of the proposed project would reduce the extent and severity of climate change-related impacts to the project by providing methods for adapting to these changes. Additionally, the extent to which the climate change-related hazards would increase is speculative, and any increases in hazard levels would occur over a long time frame compared to the design life of the project. For these reasons, this impact is considered **less than significant**, and no mitigation is required.