4.7 GREENHOUSE GAS EMISSIONS

This section provides an overview of existing Greenhouse Gas (GHG) Emissions within the project study area and identifies applicable Federal, State, and local policies related to global climate change. The impact assessment provides an evaluation of potential adverse effects with regards to GHG Emissions based on criteria derived from the California Environmental Quality Act *(*CEQA) Guidelines in conjunction with actions proposed in Chapter 3, Project Description. Scientific Resources Associated (SRA) prepared an Air Quality/GHG Emissions Technical Report in October 2011 for the projects, including Mt. Signal Solar Farm 1 (MSSF1), Calexico Solar Farm 1 Phase A (CSF1(A)), Calexico Solar Farm 1 Phase B (CSF1(B)), Calexico Solar Farm 2 Phase A (CSF2(A)), Calexico Solar Farm 2 Phase B (CSF2(B) and the off-site transmission lines (OTF-Private and OTF-BLM Lands). The report is included in Appendix D of this Environmental Impact Report (EIR).

4.7.1 Environmental Setting

Global Climate Change (GCC) refers to changes in average climatic conditions on Earth as a whole, including temperature, wind patterns, precipitation and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), which are known as greenhouse gases (GHGs). These gases allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. Gases that trap heat in the atmosphere are often called greenhouse gases, analogous to a greenhouse. GHGs are emitted by both natural processes and human activities. The accumulation of GHGs in the atmosphere regulates the Earth's temperature. Emissions from human activities, such as burning fossil fuels for electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere.

The State of California has been at the forefront of developing solutions to address GCC. GCC refers to any significant change in measures of climate, such as average temperature, precipitation, or wind patterns over a period of time. GCC may result from natural factors, natural processes, and/or human activities that change the composition of the atmosphere and alter the surface and features of land.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The IPCC concluded that a stabilization of GHGs at 400 to 450 ppm CO_2 equivalent concentration is required to keep global mean warming below 3.6 degrees Fahrenheit (ºFahrenheit) (2º Celsius), which is assumed to be necessary to avoid dangerous climate change (Association of Environmental Professionals 2007).

State law defines greenhouse gases as any of the following compounds CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety, Code Section 38505(g)).

The State of California GHG Inventory performed by the California Air Resources Board (ARB), compiled statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, HFCs, and PFCs. The current inventory covers the years 1990 to 2008, and is summarized in Table 4.7-1. Data sources used to calculate this GHG inventory include California and Federal agencies, international organizations, and industry associations. The calculation methodologies are consistent with guidance from the IPCC. The 1990 emissions level is the sum total of sources and sinks from all sectors and categories in the inventory. The inventory is divided into seven broad sectors and categories in the inventory. These sectors include: agriculture, commercial, electricity generation, forestry, industrial, residential, and transportation.

TABLE 4.7-1. CALIFORNIA GHG EMISSIONS INVENTORY 1990 - 2008

Sector	Total 1990 Emissions ($MMTCO_2e$)[1]	Percent of Total 1990 Emissions	Total 2008 Emissions ($MMTCO_2e$)	Percent of Total 2008 Emissions
Agriculture	23.4	5 %	28.06	6 %
Commercial	14.4	3 %	14.68	3 %
Electricity Generation	110.6	26 %	116.35	25 %
Forestry (excluding sinks)	0.2	<1 %	0.19	<1 %
Industrial	103.0	24 %	92.66	20 %
Residential	29.7	7 %	28.45	6 %
Transportation	150.7	35 %	174.99	37 %
Recycling and Waste	-	-	6.71	1 %
High GWP Gases	-	-	15.65	3 %
Forestry Sinks	(6.7	-	(3.98)	-

Source: SRA 2011.
Note: $MMTCO_2e$ = million metric tons of CO_2 equivalent.

When accounting for GHGs, all types of GHG emissions are expressed in terms of CO_2 equivalents (CO_2e) and are typically quantified in metric tons (MT) or millions of metric tons (MMT).

GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the cumulative radiative forcing effect of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas (U. S. EPA 2006). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main GHGs that have been attributed to human activity include CH_4, which has a GWP of 21, and N_2O, which has a GWP of 310. Table 4.7-2 presents the GWP and atmospheric lifetimes of common GHGs.

TABLE 4.7-2. GLOBAL WARMING POTENTIAL AND ATMOSPHERIC LIFETIMES OF COMMON GHGS

GHG	Formula	100-Year Global Warming Potential	Atmospheric Lifetime (Years)
Carbon Dioxide	CO_2	1	Variable
Methane	CH_4	21	12 ± 3
Nitrous Oxide	N_2O	310	120
Sulfur Hexaflouride	SF_6	23,900	3,200

Source: SRA 2011.

4.7.1.1 Regulatory Setting

On a national scale, federal agencies are addressing emissions of GHGs by reductions mandated in federal laws and Executive Orders, most recently, Executive Order 13423 Strengthening Federal Environmental, Energy, and Transportation Management (January 24, 2007) was enacted. Several states have promulgated laws as a means to reduce statewide levels of GHG emissions. In particular, the California Global Warming Solutions Act of 2006 directs the State of California to reduce statewide GHG emissions to 1990 levels by the year 2020.

Federal

Recent actions by the U.S. EPA have allowed for the regulation of GHGs. On April 17, 2009, the U.S. EPA issued its proposed endangerment finding for GHG emissions. On December 7, 2009, the U.S. EPA Administrator signed and finalized two distinct findings regarding greenhouse gases under Section 202(a) of the Clean Air Act:

Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs: CO_2, CH_4, N_2O, HFCs, PFCs, and SF6 in the atmosphere threaten the public health and welfare of current and future generations.

Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action was a prerequisite to finalizing the U.S. EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by U.S. EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009 and adopted on April 1, 2010. As finalized in April 2010, the emissions standards rule for vehicles will improve average fuel economy standards to 35.5 miles per gallon by 2016. In addition, the rule will require model year 2016 vehicles to meet an estimated combined average emission level of 250 grams of CO_2 per mile.

On March 10, 2009, in response to the Fiscal Year 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110–161), the U.S. EPA proposed a rule that requires mandatory reporting of GHG emissions from large sources in the United States. On September 22, 2009, the Final Mandatory Reporting of Greenhouse Gases Rule was signed, and was published in the Federal Register on October 30, 2009. The rule became effective on December 29, 2009. The rule will collect accurate and comprehensive emissions data to inform future policy decisions.

The U.S. EPA is requiring suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 MT or more per year of GHG emissions to submit annual reports to U.S. EPA. The gases covered by the proposed rule are CO_2, CH_4, N_2O, HFC, PFC, SF_6, and other fluorinated gases, including nitrogen trifluoride (NF_3) and hydrofluorinated ethers (HFE).

State

California Code of Regulations Title 24. Although not originally intended to reduce greenhouse gas emissions, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in greenhouse gas emissions. Therefore, increased energy efficiency results in decreased greenhouse gas emissions. CARB's greenhouse gas inventory is based on 2006 Title 24 standards.

California Assemble Bill 1493. California Assembly Bill (AB) 1493 enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB will apply to 2009 and later model year vehicles. CARB estimates that the regulation will reduce climate change emissions from light duty passenger vehicle fleet by an estimated 18% in 2020 and by 27% in 2030. The federal Corporate Average Fuel Economy (CAFE) standard determines the fuel efficiency of certain vehicle classes in the United States. In 2007, as part of the Energy and Security Act of 2007, CAFE standards were increased for new light-duty vehicles to 35 miles per gallon by 2020.

Executive Order S-01-07. Executive Order S-01-07 was enacted by the Governor on January 18, 2007. Essentially, the order mandates the following: (1) that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020; and (2) that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. It is assumed that the effects of the LCFS would be a 10% reduction in GHG emissions from fuel use by 2020.

Executive Order S-3-05. Executive Order S-3-05, signed by Governor Schwarzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80% reduction in GHG emissions by 2050. Executive Order S-3-05 also calls for the California EPA (CalEPA) to prepare biennial science reports on the potential impact of continued GCC on certain sectors of the California economy. The first of these reports, "Our Changing Climate: Assessing Risks to California," and its supporting document "Scenarios of Climate Change in California: An Overview" were published by the California Climate Change Center in 2006.

Assembly Bill 32, the California Global Warming Solutions Act of 2006. In September 2006, Governor Schwarzenegger signed California AB 32, the global warming bill, into law. AB 32 directs CARB to do the following:

- Make publicly available a list of discrete early action GHG emission reduction measures that can be implemented prior to the adoption of the statewide GHG limit and the measures required to achieve compliance with the statewide limit.
- Make publicly available a GHG inventory for the year 1990 and determine target levels for 2020.
- On or before January 1, 2010, adopt regulations to implement the early action GHG emission reduction measures.
- On or before January 1, 2011, adopt quantifiable, verifiable, and enforceable emission reduction measures by regulation that will achieve the statewide GHG emissions limit by 2020, to become operative on January 1, 2012, at the latest. The emission reduction measures may include direct emission reduction measures, alternative compliance mechanisms, and potential monetary and nonmonetary incentives that reduce GHG emissions from any sources or categories of sources that ARB finds necessary to achieve the statewide GHG emissions limit.
- Monitor compliance with and enforce any emission reduction measure adopted pursuant to AB 32.
- CARB has estimated that the 1990 GHG emissions level was 427 MMT net CO_2e. In 2004, the emissions were estimated at 480 MMT net CO_2e. CARB estimates that a reduction of 173 MMT net CO_2e emissions below business-as-usual would be required by 2020 to meet the 1990 levels. This amounts to a 15% reduction from today's levels and a 30 %reduction from projected business-as-usual levels in 2020.

In response to the requirements of AB 32, the CARB produced a list of 37 early actions for reducing GHG emissions in June 2007. The CARB expanded this list in October 2007 to 44 measures that have the potential to reduce GHG emissions by at least 42 MMT of CO_2 emissions by 2020, representing about 25% of the estimated reductions needed by 2020.

Senate Bill 97. Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs Office of Planning and Research (OPR) to develop draft CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions" by July 1, 2009, and directs the Resources Agency to certify and adopt the CEQA Guidelines by January 1, 2010.

On December 30, 2009, the Natural Resources Agency adopted amendments to the CEQA Guidelines in the California Code of Regulations. The amendments went into effect on March 18, 2010, and are summarized below:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan.
- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. In addition, consideration of several qualitative factors may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. The Guidelines do not set or dictate specific thresholds of significance.
- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts.
- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions in Appendix G of the CEQA Guidelines.
- The Guidelines are clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation."
- The Guidelines promote the advantages of analyzing GHG impacts on an institutional, programmatic level, and therefore approve tiering of environmental analyses and highlights some benefits of such an approach.
- Environmental impact reports (EIRs) must specifically consider a project's energy use and energy efficiency potential, pursuant to Appendix F of the CEQA Guidelines.

Senate Bill 375. Senate Bill 375 requires that regions within the State which have a metropolitan planning organization must adopt a sustainable communities strategy as part of their regional transportation plans. The strategy must be designed to achieve certain goals for the reduction of GHG emissions. The bill finds that GHG from autos and light trucks can be substantially reduced by new vehicle technology, but even so, "it will be necessary to achieve significant additional GHG reductions from changed land use patterns and improved transportation. Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 provides that new CEQA provisions be enacted to encourage developers to submit applications and local governments to make land use decisions that will help the State achieve its goals under AB 32," and that "current planning models and analytical techniques used for making transportation infrastructure decisions and for air quality planning should be able to assess the effects of policy choices, such as residential development patterns, expanded transit service and accessibility, the walkability of communities, and the use of economic incentives and disincentives."

Senate Bill 1078, Senate Bill 107, and Executive Order S-14-08. SB 1078 initially set a target of 20% of energy to be sold from renewable sources by the year 2017. The schedule for implementation of the Renewables Portfolio Standard (RPS) was accelerated in 2006 with the Governor's signing of SB 107, which accelerated the 20% RPS goal from 2017 to 2010. On November 17, 2008, the Governor signed Executive Order S-14-08, which requires all retail sellers of electricity to serve 33% of their load with renewable energy by 2020.

Executive Order S-21-09. Executive Order S-21-09 was enacted by the Governor on September 15, 2009. Executive Order S-21-09 requires that the CARB, under its AB 32 authority, adopt a regulation by July 31, 2010 that sets a 33% renewable energy target as established in Executive Order S-14-08. Under Executive Order S-21-09, the CARB will work with the Public Utilities Commission (PUC) and California

Energy Commission to encourage the creation and use of renewable energy sources, and will regulate all California utilities. The CARB will also consult with the Independent System Operator and other load balancing authorities on the impacts on reliability, renewable integration requirements, and interactions with wholesale power markets in carrying out the provisions of the Executive Order. The order requires the CARB to establish highest priority for those resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health.

County of Imperial

Pursuant to the requirements of SB 97, the Resources Agency adopted amendments to the State CEQA Guidelines to provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and GCC impacts. Formal CEQA thresholds for lead agencies must always be established through a public hearing process. Imperial County has not established formal quantitative or qualitative thresholds through a public rulemaking process, but CEQA permits the lead agency to establish a project-specific threshold of significance if backed by substantial evidence, until such time as a formal threshold is approved.

4.7.1.2 Existing Conditions

Greenhouse gases are gases that trap heat in the atmosphere. These emissions occur from natural processes as well as human activities. The accumulation of GHGs in the atmosphere regulates the earth's temperature. Scientific evidence indicates a trend of increasing global temperature over the past century, which a number of scientists attribute to an increase in GHG emissions from human activities. Recent observed changes due to global warming include shrinking glaciers, thawing permafrost, a lengthened growing season, and shifts in plant and animal ranges (Intergovernmental Panel on Climate Change 2007). Generally accepted predictions of long-term environmental impacts due to global warming include sea level rise, changing weather patterns with increases in the severity of storms and droughts, changes to local and regional ecosystems including the potential loss of species, and a significant reduction in winter snow pack.

Human-caused sources of CO_2 include combustion of fossil fuels (coal, oil, natural gas, gasoline and wood). Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. Concentrations of CO_2 have increased in the atmosphere since the industrial revolution. CH_4 is the main component of natural gas and also arises naturally from anaerobic decay of organic matter. Human-caused sources of natural gas include landfills, fermentation of manure and cattle farming. Human-caused sources of N_2O include combustion of fossil fuels and industrial processes such as nylon production and production of nitric acid. Other GHGs are present in trace amounts in the atmosphere and are generated from various industrial or other uses. GHGs present in the project study area primarily include CO_2 and N_2O from farm equipment and local traffic.

The California Climate Change Center (CCCC) used a range of emissions scenarios developed by the IPCC to project a series of potential warming ranges (i.e., temperature increases) that may occur in California during the 21st century. Three warming ranges were identified: Lower warming range (3.0 to 5.5 ºF); medium warming range (5.5 to 8.0 ºF); and higher warming range (8.0 to 10.5 ºF). The CCCC also presents an analysis of the future projected climate changes in California under each warming range scenario (CCCC 2006).

According to CCCC, substantial temperature increases would result in a variety of impacts to the people, economy, and environment of California. These impacts would result from a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. These impacts are described below.

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 O_3 formation are projected to increase by 25 to 35% under the lower warming range and 75 to 85% under the medium warming range. In addition, if global background O_3 levels increase as is predicted in some scenarios, it may become impossible to meet local air quality standards. An increase in wildfires could also occur, and the corresponding increase in the release of pollutants including $PM_{2.5}$ could further compromise air quality. The Climate Scenarios report indicates that large wildfires could become up to 55% more frequent of GHG emissions are not significantly reduced.

Potential health effects from global climate change may arise from temperature increases, climate-sensitive diseases, extreme events, and air quality. There may be direct temperature effects through increases in average temperature leading to more extreme heat waves and less extreme cold spells. Those living in warmer climates are likely to experience more stress and heat-related problems (e.g., heat rash and heat stroke). In addition, climate sensitive diseases (such as malaria, dengue fever, yellow fever, and encephalitis) may increase, such as those spread by mosquitoes and other disease-carrying insects.

Water Resources. A vast network of 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 mountain snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages. In addition, if temperatures continue to rise more precipitation would fall as rain instead of snow, further reducing the Sierra Nevada spring snowpack by as much as 70 to 90%. The State's water resources are also at risk from rising sea levels. An influx of seawater would degrade California's estuaries, wetlands, and groundwater aquifers.

Agriculture. Increased GHG and associated increases in temperature are expected to cause widespread changes to the agricultural industry, reducing the quantity and quality of agricultural products statewide. Significant reductions in available water supply to support agriculture would also impact production. Crop growth and development will change as will the intensity and frequency of pests and diseases.

Ecosystems/Habitats. Continued global warming will likely shift the ranges of existing invasive plants and weeds, thus alternating 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. Continued global warming is also likely to increase the populations of and types of pests. Continued global warming would also affect natural ecosystems and biological habitats throughout the State.

Wildland Fires. Global warming is expected to increase the risk of wildfire and alter the distribution and character of natural vegetation. 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.

Rising Sea Levels. Rising sea levels, more intense coastal storms, and warmer water temperatures will increasing threaten the State's coastal regions. Under the high warming scenario, sea level is anticipated to rise 22 to 35 inches by 2100. A sea level risk of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten levees and inland water systems, and disrupt wetlands and natural habitats.

4.7.2 Impacts and Mitigation Measures

This section presents the significance criteria used for considering project-related land used compatibility impacts and consistency with applicable planning documents, the methodology employed for the evaluation, and mitigation requirements, if necessary.

4.7.2.1 Thresholds of Significance

Based on Appendix G of the CEQA Guidelines and the professional judgment of County staff and consultants, the County concludes that the projects would result in a significant impact on the environment if it would result in:

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

As discussed in *Section 15064.*4 of the CEQA Guidelines, the determination of the significance of GHG 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 GHG 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.

A lead agency should consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:

1) The extent to which the project may increase or reduce GHG 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; and
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 GHG 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 GHG 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.

Different agencies and studies estimate different goals for reduction of emissions to achieve 1990 levels by the year 2020, as set forth in AB 32. Some agencies have estimated a reduction of 28% to 29%, based on the ARB's analysis that statewide 2020 business as usual GHG emissions would be 596 MMT CO_2e, with 1990 emissions of 427 $MMTCO_2e$, for a reduction of 28.35% (ARB 2010).

To determine if a project would generate GHG emissions that would directly or indirectly have a significant impact on the environment and would warrant the imposition of GHG-reducing mitigation

measures, the South Coast Air Quality Management District (SCAQMD) proposed a threshold of 10,000 MT of CO_2e for industrial projects (http://www.aqmd.gov/hb/2008/December/081231a.htm). If an industrial project's GHG emissions falls within the bottom 10% of industrial projects emitting GHGs then it is not cumulatively considerable. There is substantial evidence to support that a 10,000 $MTCO_2e$ threshold would capture 90% of GHG emissions from industrial projects. Using AQMD's Annual Emission Reporting (AER) Program staff compiled reported annual natural gas consumption for 1,297 permitted facilities for 2006 through 2007 and rank-ordered the facilities to estimate the 90th percentile of the cumulative natural gas usage for all permitted facilities. Approximately 10% of facilities evaluated comprise more than 90% of the total natural gas consumption, which corresponds to 10,000 $MTCO_2e$ emissions per year (the majority of combustions emissions is composed of CO_2). This value represents a boiler with a rating of approximately 27 million British thermal units per hour (mmBtu/hour) of heat input, operating at an 80% capacity factor. It should be noted that this analysis did not include other possible GHG pollutants such as methane, N_2O; a life-cycle analysis; mobile sources; or indirect electricity consumption. Therefore, when implemented, staff's recommended interim proposal is expected to capture more than 90% of GHG emissions from stationary source projects. A significance threshold of 10,000 $MTCO_2e$ is conservative because it will likely capture more than 90% of the GHG emissions from industrial sources.

4.7.2.2 Methodology

Projects that meet the criteria for conducting a climate change analysis are required to conduct a GHG inventory and disclose GHG emissions associated with project implementation and operation under business as usual conditions. Business as usual is defined as the emissions that would have occurred in the absence of reductions mandated under AB 32.

The main source of GHG emissions associated with the projects would be combustion of fossil fuels during construction of the projects. Emissions of GHGs were calculated using the same approach as emissions for overall construction emissions discussed in Chapter 4.3 of this EIR. Emission calculations are provided in the Air Quality Technical Report in Appendix D of this EIR. The potential effects of proposed GHG emissions are by nature global, and have cumulative impacts. As individual sources, GHG emissions are not large enough to have an appreciable effect on climate change. Therefore, the impact of proposed GHG emissions to climate change is discussed in the context of cumulative impacts.

4.7.2.3 Impact Analysis

IMPACT 4.7-1	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Construction of the projects would result in a temporary increase in GHG emissions.

Construction

MSSF1, CSF1(A), CSF1(B), CSF2(A), CSF2(B), and OTF-Private and OTF-BLM Lands

Emissions associated with construction would be temporary, likely to occur in only one three-year period. Table 4.7-3 shows the construction CO_2 emissions associated with the projects. The total CO_2 emissions would exceed the 10,000 MT/yr SCAQMD threshold. The projects will be phased over a three-year period; therefore, it is unlikely that the total emissions would occur within a one year time frame. The projects'CO2 emissions would be above 10,000 MT/yr including construction of the OTF-Private and OTF-BLM Lands. Although emissions associated with construction would be temporary, and likely to occur in only one three-year period, a potentially significant impact is identified. Mitigation is required and presented below. As discussed below, implementation of the listed mitigation measures would reduce impacts to **less than significant.** A similar scenario would occur during the decommissioning and site

restoration stage for each of the projects. GHG emissions would be similar to or less than the emissions presented for construction. The mitigation measures stated below would apply to the decommissioning stage of the projects as well and would reduce impacts to below a level of significance.

TABLE 4.7-3. SUMMARY OF CONSTRUCTION CO_2 EMISSIONS

Projects	CO_2 Emissions (Metric Tons/Year)
MSSF1	16,597
CSF1(A) and (B)	16,618
CSF2(A) and (B)	16,588
OTF-Private and BLM Lands	11,788
Total	61,591

Source: SRA 2011.

Operations

MSSF1, CSF1(A), CSF1(B), CSF2(A), CSF2 (B), OTF-Private and OTF-BLM Lands

Emissions associated with operations are estimated to be 1,305 MT/yr of CO_2e, well below the 10,000 MT per year threshold. Operational emissions would be primarily associated with vehicle trips, lighting, security, and energy used for the O&M buildings. A **less than significant** impact is identified.

Mitigation Measure(s)

The following mitigation measures are required for MSSF1, CSF1(A), CSF1(B), CSF2(A),CSF2(B), OTF-Private, and OTF-BLM Lands.

4.7-1a Diesel Equipment (Compression Ignition) Offset Strategies

a. Use electricity from power poles rather than temporary diesel power generators.

b. Construction equipment operating on-site should be equipped with two to four degree engine timing retard or precombustion chamber engines.

c. Construction equipment used for the projects should utilize EPA Tier 2 or better engine technology (requirement under Mitigation Measure 4.3-1 as described in Chapter 4.3 of this EIR).

4.7-1b Vehicular Trip (Spark Ignition) Offset Strategies

a. Encourage commute alternatives by informing construction employees and customers about transportation options for reaching your location (i.e., post transit schedules/routes).

b. Help construction employees rideshare by posting commuter ride sign-up sheets, employee home zip code map, etc.

c. When possible, arrange for a single construction vendor who makes deliveries for several items.

d. Plan construction delivery routes to eliminate unnecessary trips.

e. Keep construction vehicles well maintained to prevent leaks and minimize emissions, and encourage employees to do the same.

Significance After Mitigation

Construction activities associated with construction of the projects and OTF-Private and OTF-BLM Land would result in short-term GHG emissions impacts. Implementation of Mitigation Measures 4.7-1a would reduce emissions by 40-60%; Mitigation Measure 4.7-1b would reduce emissions by 30-70%. With implementation of these mitigation measures, short-term construction impacts would be **less than significant**. Additionally, project construction would adhere to Mitigation Measures 4.3-1a and 4.3-1b outlined in Chapter 4.3 of this EIR, further reducing GHG emissions.

IMPACT 4.7-2	Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The projects would generate additional solar power in order to meet the state of California's goals for the Renewable Portfolio Standard, which has been identified by the state as a means of meeting the goals of AB 32 to reduce emissions to 1990 levels by the year 2020. Therefore, they would not conflict with applicable plans, policies, or regulations.

Construction and Operation

MSSF1, CSF1(A), CSF1(B), CSF2(A), CSF2(B), OTF-Private, and OTF-BLM Lands

Construction would result in a temporary increase in GHG emissions as identified above under Impact 4.7-1. Mitigation measures are proposed to reduce the impact to a level below significance. Additionally, as proposed, the projects would aid the state in meeting its goal of reducing GHG emissions to 1990 levels by 2020. Additionally, the projects would assist SDG&E in meeting their voluntarily commitment to achieving 33% of its power from renewable resources by 2020. The projects would therefore not conflict with the goals of AB 32 in reducing emissions of GHG. A **less than significant** impact is identified.

4.7.3 Residual Impacts

Through implementation of Mitigation Measures 4.7-1a, 4.7-1b, 4.3-1a, and 4.3-1b mitigation, impacts related to the temporary increase of GHG emissions during construction would be mitigated and reduced to a **less than significant** level. Operation of the projects, subject to the provision of a CUP, would generally be consistent with AB 32. Based on these circumstances, the projects would not result in any residual significant and unavoidable impacts with regards to global climate change.

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