7 CLIMATE CHANGE

INTRODUCTION

This chapter provides background information about greenhouse gas (GHG) emissions and climate change. Emissions of GHGs have the potential to adversely affect the environment because such emissions contribute cumulatively to global climate change. Cumulative emissions from many projects and activities affect global GHG concentrations and the climate system. Unlike criteria air pollutants and toxic air contaminants that tend to have more localized or regional impacts, GHG emissions tend to disperse more broadly and are more of a global concern because of their relatively longer atmospheric lifetimes compared to air pollutant emissions. Therefore, the total amount and types of GHG emissions, regardless of their location, have the most significant effect on climate change globally.

In response to the Notice of Preparation, the Sacramento Metropolitan Air Quality Management District (SMAQMD) recommended that the analysis of GHG emissions consider the SMAQMD's CEQA Guide to Air Quality Assessment in Sacramento County (SMAQMD 2021). In addition, another comment in response to the Notice of Preparation recommended that the analysis consider the loss of carbon sequestration related to the removal of trees during construction activities.

ENVIRONMENTAL SETTING

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space through the atmosphere. However, infrared radiation is selectively absorbed by GHGs in the atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on Earth. Anthropogenic (e.g., human caused) emissions of GHGs lead to atmospheric levels in excess of natural ambient concentrations and have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change.

The Intergovernmental Panel on Climate Change (IPCC) concluded that variations in natural phenomena, such as solar radiation and volcanoes, produced most of the warming of the earth from pre-industrial times to 1950. Some variations in natural phenomena also had a small cooling effect. From 1950 to the present, increasing GHG concentrations resulting from human activity, such as fossil fuel burning and

deforestation, have been responsible for most of the observed temperature increase (IPCC 2023).

Global surface temperature has increased by approximately 1.1 degrees Celsius (°C) over the last 140 years (IPCC 2023); the likely total human-caused global surface temperature increase is 1.07°C. The rate of increase in global average surface temperature has not been consistent; the last five decades have warmed at a much faster rate per decade (IPCC 2023).

During the same period when increased global warming has occurred, many other changes have occurred in other natural systems. Sea levels have risen; precipitation patterns throughout the world have shifted, with some areas becoming wetter and others drier; snowlines have increased elevation, resulting in changes to the snowpack, runoff, and water storage; and numerous other conditions have been observed. Although it is difficult to prove a definitive cause-and-effect relationship between global warming and other observed changes to natural systems, there is a high level of confidence in the scientific community that these changes are a direct result of increased global temperatures caused by the increased presence of GHGs in the atmosphere (IPCC 2023).

Principal Greenhouse Gases and Sources

GHGs are present in the atmosphere naturally, are released by both natural and anthropogenic sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals, and plants; decomposition of organic matter; volcanic activity; and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels by stationary and mobile sources, waste treatment, and agricultural processes. The following are the principal GHG pollutants that contribute to climate change and their primary emission sources:

- **Carbon Dioxide (CO_2):** Natural sources of CO_2 include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; and evaporation from oceans. Anthropogenic sources include burning of coal, oil, natural gas, and wood.
- **Methane (CH_4):** CH_4 is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N_2O):** N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests.

- **Fluorinated gases:** These gases are typically emitted in smaller quantities, but because they are potent greenhouse gases, they are sometimes called High Global Warming Potential (High GWP) gases. These High GWP gases include:
  - **Chlorofluorocarbons (CFCs):** These GHGs are used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants.
  - **Perfluorinated Chemicals (PFCs):** PFCs are emitted as by-products of industrial processes and are also used in manufacturing.
  - **Sulfur hexafluoride (SF_6):** This is a strong GHG used primarily as an insulator in electrical transmission and distribution systems.
  - **Hydrochlorofluorocarbons (HCFCs):** These have been introduced as temporary replacements for CFCs and are also GHGs.
  - **Hydrofluorocarbons (HFCs):** These were introduced as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. HFCs are GHGs emitted as by-products of industrial processes and are also used in manufacturing.

GHGs are not monitored at local air pollution monitoring stations and do not represent a direct impact to human health. Rather, GHGs generated locally contribute to global concentrations of GHGs, which result in changes to the climate and environment.

Global Warming Potential

Global Warming Potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time the gas remains in the atmosphere (its "atmospheric lifetime"). The GWP of each gas is measured relative to CO_2. Therefore, CO_2 has a GWP of 1. GHGs with lower emissions rates than CO_2 may still contribute to climate change because they are more effective at absorbing outgoing infrared radiation than CO_2 (i.e., high GWP). For example, SF_6, while comprising a relatively small fraction of the total GHGs emitted annually worldwide, has a GWP of 22,800, meaning that 1 ton of SF_6 has the same contribution to the greenhouse effect as approximately 22,800 tons of CO_2. The concept of CO_2 equivalence (CO_2e) is used to account for the different GWP potentials of GHGs. GHG emissions are typically measured in terms of pounds or tons of CO_2e and are often expressed in MT CO_2e.

Climate change is a global issue because GHGs can have global effects, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern (see Chapter 5 "Air Quality"). Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one year to several thousand years), or long enough to be dispersed around the globe.

Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources through uncertain impacts related to future air temperatures and precipitation patterns. The IPCC's 2023 Synthesis Report indicated that warming of the climate system is unequivocal and, since the 1950s, many of the observed changes are unprecedented over decades to millennia. Signs that global climate change has occurred include warming of the atmosphere and ocean, diminished amounts of snow and ice, and rising sea levels (IPCC 2023).

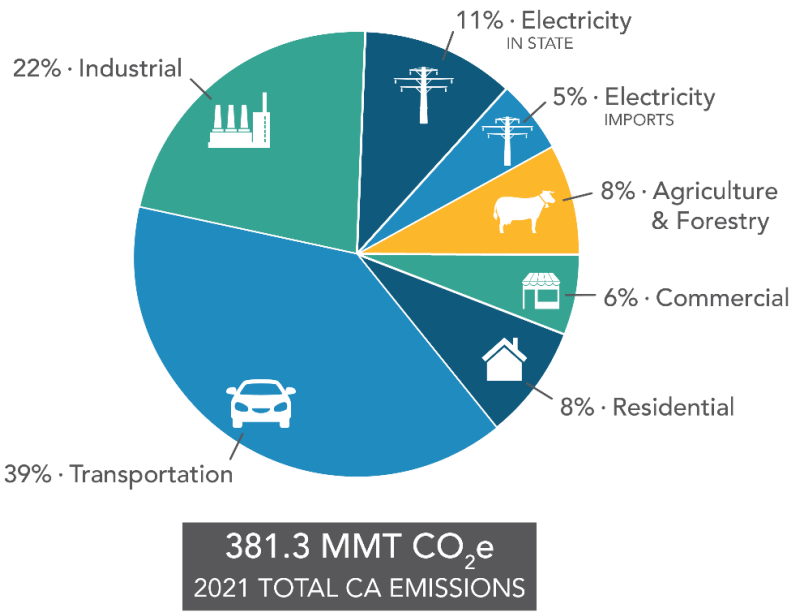
Although climate change is driven by global atmospheric conditions, climate change impacts are felt locally. A scientific consensus confirms that climate change is already affecting California. As noted in the Sacramento Valley Regional Report of the California's Fourth Climate Change Assessment (Houlton and Lund 2018), climate change is expected to make the Sacramento region hotter, drier, and increasingly prone to extremes like megadroughts, flooding, and large wildfires. These changing conditions are likely to affect water and energy availability, agricultural systems, plants and wildlife, public health, housing, and quality of life.

In Sacramento County, potential hazards (or exposures) related to climate change have also been analyzed as part of the Climate Change Vulnerability Assessment for the Sacramento County Climate Action Plan (Communitywide CAP) (County of Sacramento 2017a). The direct, or primary, effects of climate change analyzed for Sacramento County include increased temperature, changes in precipitation patterns, and sea level rise. Secondary consequences, which could occur as result of one or a combination of these primary effects include increased frequency, intensity, and duration of extreme heat days and heat waves/events; loss of snowpack and decreased water supplies; increased wildfire; and increased flooding.

State Greenhouse Gas Emissions Inventory and Trends

The California Air Resources Board (CARB) prepares an annual inventory of statewide GHG emissions. GHGs are typically analyzed by sector, a term that refers to the type of activity. As shown in Plate CC-1, 381.3 million MT CO_2e were generated in 2021. The transportation sector represents the single largest source of California's GHG emissions in 2021, accounting for 39 percent of total GHG emissions. Transportation was followed by industrial sources, which accounted for 22 percent, and then by the electricity sector (in-state sources and imported electricity), which accounted for 16 percent of total GHG emissions (CARB 2023).

Plate CC-1: 2021 California Greenhouse Gas Emissions Inventory by Sector

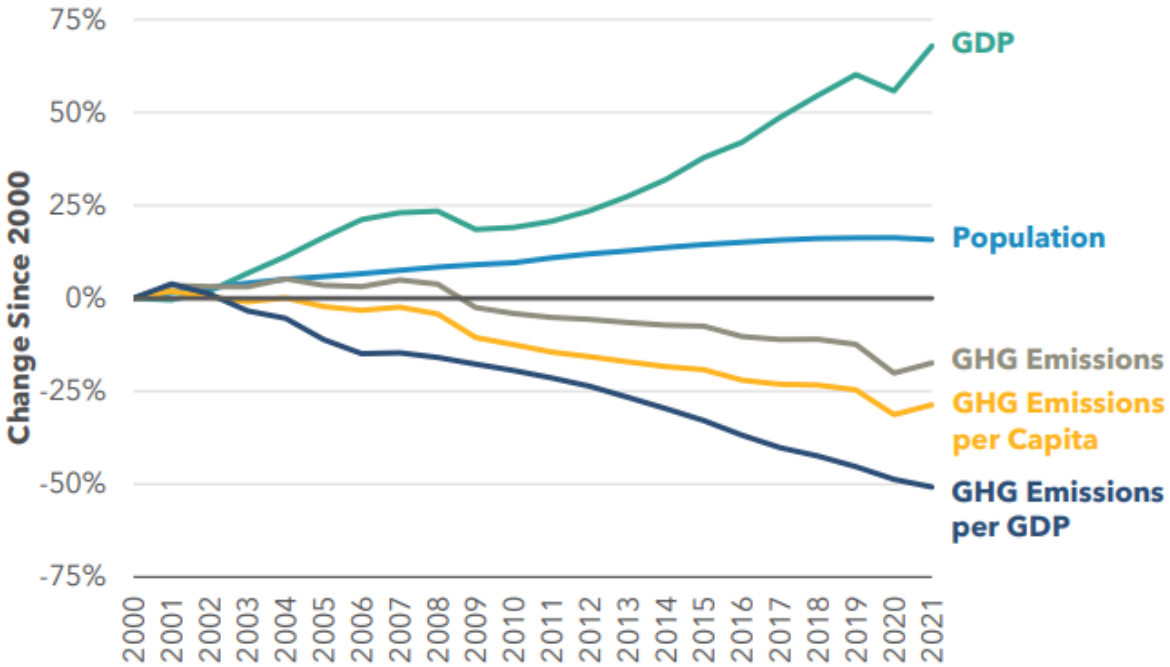


Source: CARB 2023

California has implemented several programs and regulatory measures to reduce GHG emissions. Plate CC-2: demonstrates California's progress in reducing statewide GHG emissions. Since 2007, California's GHG emissions have been declining, with the exception of 2021[1], even as population and gross domestic product have increased. Per-capita GHG emissions in 2021 were 30 percent lower than the peak per-capita GHG emissions recorded in 2001. Similarly, GHG emissions per million dollars of gross domestic product have decreased by 51 percent since the peak in 2001.

[1] Both the 2019 to 2020 decrease and the 2020 to 2021 increase in emissions are likely due in large part to the impacts of the COVID-19 pandemic. Emissions levels in 2020 are anomalous to the long-term trend, and the one-year increase from 2020 to 2021 should be considered in the broader context of the pandemic and subsequent economic recovery that took place over 2021 (CARB 2023).

Plate CC-2: Trends in California Greenhouse Gas Emissions (Years 2000 to 2021)



Source: CARB 2023

Local Greenhouse Gas Emissions Inventory

As part of the Sacramento County Climate Action Plan (CAP), the County established a baseline and forecasted GHG emissions inventory for the community and government operations. The total community-wide GHG emissions in the 2015 baseline year were 4,173,426 MT CO_2e; while the forecasted GHG emissions for 2030 are 3,309,712 MT CO_2e (County of Sacramento 2024a, 2022). The County updated the GHG emissions inventory in 2024 for the year 2021, and in this community-wide inventory, the total was 4,159,556 MT CO_2e (County of Sacramento 2024a). As with the state as a whole, transportation is the top source of GHG emissions for Sacramento County with 43 percent of the total, followed by building energy with 36 percent.

Regulatory Setting

While most do not directly inform proposed project implementation or impact determination, federal, state, regional, and local GHG-related plans, policies, and regulations are helpful for understanding the overall context for GHG emissions impacts and strategies to reduce GHG emissions.

Federal

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA). On April 2, 2007, the U.S. Supreme Court held that the EPA must consider regulation of motor vehicle GHG emissions. In

Massachusetts v. Environmental Protection Agency et al., 12 states and cities (including California) along with several environmental organizations sued to require EPA to regulate GHGs as pollutants under the CAA (127 S. Ct. 1438 [2007]). The Supreme Court ruled that GHGs fit within the CAA's definition of a pollutant and that EPA had the authority to regulate GHGs.

U.S. Environmental Protection Agency "Endangerment" and "Cause or Contribute" Findings

On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- *Endangerment Finding:* The current and projected concentrations of the six key GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations.
- *Cause or Contribute Finding:* The combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

State

The legal framework for GHG emission reductions has come about through Executive Orders, legislation, and regulations. The major components of California's climate change initiatives are outlined below.

Executive Order S-3-05

Executive Order (EO) S-3-05, issued in 2005 in recognition of California's vulnerability to the effects of climate change, set forth the following target dates by which statewide GHG emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32 and the State Climate Change Scoping Plan

In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in Executive Order S-3-05: reduce GHG emissions below 1990 levels by 2020. AB 32 also identifies CARB as the State agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

In December 2008, CARB adopted the Climate Change Scoping Plan (Scoping Plan), which contains the main strategies California will implement to achieve the required GHG reductions required by AB 32 (CARB 2008). The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of California's GHG inventory. CARB acknowledges that land use planning decisions will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors. The Scoping Plan details the

regulations, alternative compliance mechanisms, voluntary actions and incentives, etc. proposed to meet the target emission reduction levels.

CARB is required to update the Scoping Plan at least once every five years to evaluate progress and develop future inventories that may guide this process. The *First Update to the Climate Change Scoping Plan: Building on the Framework* (2014 Scoping Plan Update) determined that the state was on schedule to achieve the 2020 target. However, an accelerated reduction in GHG emissions would be required to achieve the EO S-3-05 emissions reduction target for 2050.

In November 2017, CARB released its second update to the Scoping Plan, *California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target* (2017 Scoping Plan Update) (CARB 2017). The 2030 target of a 40 percent reduction in GHG emissions below 1990 statewide GHG emissions (consistent with EO B-30-15, which is outlined below) guides the 2017 Scoping Plan Update (CARB 2017). The 2017 Scoping Plan Update establishes a plan of action, consisting of a variety of strategies to be implemented rather than a single solution, for California to reduce statewide emissions by 40 percent by 2030 compared to 1990 levels (CARB 2017).

In December 2022, CARB approved the third update to the Scoping Plan Update, *2022 Scoping Plan for Achieving Carbon Neutrality*, which evaluates progress toward the 2030 target, as well as examining scenarios that could achieve carbon neutrality by 2045 or sooner (CARB 2022). The 2022 Scoping Plan Update focuses on actions needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and others, and is designed to meet the State's long-term climate objectives. The 2022 Scoping Plan includes strategies to increase clean energy sources, including the addition of utility scale solar energy generation and storage (CARB 2022).

Executive Order B-30-15, Senate Bill 32, and Assembly Bill 197

EO B-30-15, signed in 2015, established a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. This emission reduction goal serves as an interim goal between the AB 32 target to achieve 1990 emission levels by 2020 and the long-term goal set by EO S-3-05 to reduce statewide emissions 80 percent below 1990 levels by 2050. In addition, the executive order aligned California's 2030 GHG reduction goal with the European Union's 2030 reduction target that was adopted in October 2014.

Senate Bill (SB) 32 signed into law the emissions goal of EO B-30-15, extending the provisions of AB 32 from 2020 to 2030 with the target of 40 percent below 1990 levels by 2030. The companion bill to SB 32, AB 197, provides additional direction to CARB on adoption of strategies to reduce GHG emissions.

Executive Order B-55-18 and Assembly Bill 1279

EO B-55-18, signed in 2018, established a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net

negative emissions thereafter. The Executive Order states that this new goal is in addition to the existing statewide targets of reducing GHG emissions.

AB 1279, the California Climate Crisis Act, was signed September 16, 2022, codifying EO B-55-18. This bill declares the policy of the state both to achieve net zero greenhouse gas emissions as soon as possible, but no later than 2045, and achieve and maintain net negative greenhouse gas emissions thereafter. It requires statewide anthropogenic greenhouse gas emissions be reduced to at least 85 percent below 1990 levels by 2045.

Executive Order N-19-19

EO N-19-19, signed in September 2019, directs the California Department of Finance to create a Climate Investment Framework that shifts investments into sectors that have more growth potential as a result of their focus on carbon reduction and climate resiliency. This Executive Order also directs the State Transportation Agency to align transportation spending with the State's Climate Change Scoping Plan, including directing investments to support housing production near available jobs and directs CARB to take actions that would encourage manufacturers to produce clean vehicles, increase demand for electric vehicles, and achieve needed reductions from the transportation sector.

Senate Bill 1078 (2002), Senate Bill 350 (2015), Senate Bill 100 (2021) – California Renewables Portfolio Standard

Established in 2002 by SB 1078, California's Renewables Portfolio Standard (RPS) requires electricity providers (i.e., utilities, cooperatives, and community choice aggregators) to provide a specified minimum portion of their electricity supply from eligible renewable resources by milestone target years. Since 2002, state legislative actions have modified and accelerated the RPS several times, resulting in one of the most ambitious renewable energy standards in the country. SB 350 was approved by the California legislature in September 2015 and signed by Governor Brown in October 2015. SB 350 extended the RPS target by requiring retail sellers to procure 50 percent of their electricity from renewable energy sources by 2030. Most recently, SB 100 increased the RPS target to require retail sellers of electricity to serve 60 percent of their electric load with renewable energy by 2030 with new interim targets of 44 percent by 2024 and 52 percent by 2027, as well as requiring that all of the state's electricity come from carbon-free resources (not only RPS-eligible ones) by 2045.

Mandatory Reporting of Greenhouse Gas Emissions (17 CCR Sections 95100 to 95158)

This rule applies to entities of certain sources categories, including suppliers of transportation fuels and generators of electricity. However, no specific reporting requirements apply to electric power generation from solar resources.

California Code of Regulations Title 17 CCR Sections 95350 et seq.

Adopted in 2010, the purpose of this regulation is to achieve GHG emissions reductions by reducing SF_6 emissions from electric power system gas-insulated switchgear. Owners of such switchgear must not exceed maximum allowable annual emissions rates, which

as of 2020 and each year thereafter is 1.0 percent. Owners of such switchgear must annually report SF_6 emissions, determine the emission rate relative to the SF_6 capacity of the switchgear, provide a complete inventory of all gas-insulated switchgear and their SF_6 capacities, provide a SF_6 gas container inventory, and keep all information current for CARB enforcement staff inspection and verification. Existing and new electric transmission facilities and switchgear associated with renewable energy generation would be subject to this regulation.

In September 2020, CARB adopted Resolution 20-28, to amend the current regulation. Under this resolution, CARB developed a timeline for phasing out SF_6 equipment in California in stages between 2025 and 2033 and will be creating incentives to encourage owners to replace SF_6 equipment. The Resolution was approved by the California Office of Administrative Law and filed with the Secretary of State on December 30, 2021, and the amendments became effective January 1, 2022.

Local

Sacramento Metropolitan Air Quality Management District

SMAQMD is the regional agency responsible for the regulation and enforcement of federal, state, and local air pollution control regulations in Sacramento County. In the *Guide to Air Quality Assessment* (2021), SMAQMD includes a GHG chapter that discusses the recommended approach to evaluating GHG emissions. SMAQMD states that GHG emissions should first be evaluated and addressed on a program level, if possible. In April 2020, SMAQMD adopted updated GHG thresholds of significance for land use development project operational emissions to assist lead agencies in determining significance for proposed projects during CEQA review. The thresholds include showing consistency with the 2017 Climate Change Scoping Plan. SMAQMD also includes a list of analysis expectations and methodologies for CEQA analyses. The SMAQMD guidance is discussed further in the “Thresholds of Significance” subsection below.

Sacramento County Climate Action Plan

The Sacramento County Board of Supervisors adopted a CAP on November 6, 2024. The CAP is intended to provide consistency with CARB’s 2022 Climate Change Scoping Plan and AB 1279 (County of Sacramento 2024b). The CAP details specific measures that will be implemented in the County by 2030 to reduce GHG emissions from communitywide activities and government operations. It also includes an adaptation plan that recommends actions to reduce the community’s vulnerability to the anticipated impacts of climate change. The CAP has been developed in the context of the County General Plan’s goals, objectives, and policies, and in response to the County’s adoption of a Climate Emergency Resolution in December 2020 and State legislation including AB 32, SB 32, and SB 743 as well as EOs S-3-05 and B-55-18. The strategies and measures contained in the CAP complement a wide range of policies, plans, and programs that have been adopted by the County, State, and regional agencies to protect communities from hazards and activities contributing to GHG emissions.

Sacramento County General Plan

The "Energy" Element of the County of Sacramento General Plan (County of Sacramento 2017b) includes the goal to reverse the historical trend of increasing per capita consumption of energy; shift toward using a greater share of renewable sources of energy; and shift seasonal and daily peak energy demands to increase the load factor of electrical generating facilities, while maintaining or enhancing the general standard of living, the level of employment, and the quality of the environment. The Energy Element includes the following objective and policies that are applicable to the project:

> To increase the amount of energy from wind, falling water, and geothermal sources, it is the policy of Sacramento County to:
>
> - **Policy EN-19.** Support the development and use of renewable sources of energy, including but not limited to biomass, solar, wind, and geothermal.

The "Public Facilities" Element of the General Plan (County of Sacramento 2019) includes additional goals and policies that apply to the project and are related to the siting of energy facilities to protect biological and cultural resources and human health and to promote the goals of the Air Quality and Energy Elements through support of alternative energy technologies that provide relatively clean, safe electricity.

SACRAMENTO MUNICIPAL UTILITY DISTRICT 2030 NET ZERO GHG EMISSIONS PLAN

SMUD's 2030 Zero Carbon Plan (SMUD 2021a) describes SMUD's goal of eliminating all carbon emissions from its power supply as soon as possible, but no later than 2030. To meet the standards in the Zero Carbon Plan, one of the four main areas of focus is implementing proven clean technologies, including utility-scale solar. The Zero Net Carbon Plan states that solar energy has the largest potential for resource development, is the lowest cost proven clean technology available, and has potential for local development (SMUD 2021a). A basic objective of the proposed Project is to generate and supply renewable solar electric energy, which would assist SMUD in achieving its goal of zero carbon emissions in its power supply by 2030.

The SMUD 2021 Board Monitoring Report (SMUD 2021b) determined it must procure renewable energy resources to meet or exceed the state's mandate of 33% of SMUD's retail sales by 2020, 44% by 2024, 52% by 2027, and 60% of its retail sales by 2030 and thereafter (SMUD 2021b).

Impacts and Analysis

Significance Criteria

GHG emissions have the potential to adversely affect the environment because such emissions contribute cumulatively to global climate change. It is unlikely that a single

project will contribute significantly to climate change, but cumulative emissions from many projects could affect global GHG concentrations and the global climate system. Therefore, impacts are analyzed within the cumulative context of the project's potential contribution to the significant impact of global climate change.

Based on Appendix G of the CEQA Guidelines, implementation of the proposed project would result in a cumulatively considerable contribution to the significant impact of climate change if it would:

- 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.

Section 15064.4(b) of the CEQA Statute and Guidelines, concerning determining the significance of impacts from GHG emissions, states that a lead agency may consider the following three factors in assessing the significance of impacts from GHG emissions.

- The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting.
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- 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 regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that 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.

Addressing GHG emissions impacts requires an agency to make a determination as to what constitutes a significant impact. As stated in Appendix G of the CEQA Guidelines, the significance criteria established by the applicable air quality management district may be relied on to make the above determinations.

In April 2020, the SMAQMD Board of Directors adopted the Update to the Recommended GHG Emissions Thresholds of Significance, which established thresholds of significance for GHG emissions designed to analyze a project's compliance with applicable State laws, including AB 32 and SB 32 (SMAQMD 2020a). In developing the thresholds, the SMAQMD developed the thresholds for Sacramento County based on determining Sacramento County's share of statewide 2030 GHG emissions by sector, determining the share of Sacramento County 2030 emissions from existing development versus new development, allocating 2030 GHG emissions from new development among land uses and place types to set numeric thresholds, and setting best management practices by land use and place types that achieve those numeric thresholds.

Specifically, the SMAQMD adopted a mass emissions-based threshold for the construction phase of all project types of 1,100 MT CO_2e per year (SMAQMD 2020a). For operational emissions, the SMAQMD has developed an operational screening table, which shows sizes of development projects at which 1,100 MT CO_2e would not be exceeded, including implementation of Tier 1 Best Management Practices (BMP1). Tier 1 Best Management Practices requires that projects be designed and constructed without natural gas infrastructure (BMP1), and that projects meet the current California Green Building Standards (CALGreen) Tier 2 standards and that all electric vehicle (EV) capable spaces shall instead be EV ready (BMP2). Since the proposed project's land use development type is not included in the SMAQMD operational screening level table, the analysis presented in this Chapter includes an estimate of the project's annual GHG emissions in the first year of operation.

Methodology

Short-term construction and decommissioning activities and long-term operations of the proposed project would generate GHG emissions associated with off-road and on-road exhaust and other emission sources itemized in Chapter 5, "Air Quality." Construction- and decommissioning-related and operational mobile sources (both off-road and on-road) of GHG emissions were modeled using the same methods and assumptions as those described in Chapter 5 "Air Quality," of this EIR.

In addition to those sources identified in the air quality analysis that would contribute to regional criteria air pollutant emissions, operational emissions of GHGs would be emitted from solid waste and water sources and from the use of SF_6. Solid waste disposal, including packaging materials from operations, would result in GHG emissions due to landfill off-gassing. Activities associated with supplying, conveying, treating, and distributing water for the project would result in indirect GHG emissions. Solid waste and water source GHG emissions were estimated in California Emissions Estimator Model (CalEEMod). Potential GHG emissions (in MT CO_2e) of SF_6, which is a high-GWP GHG, that could result from annual project operations were estimated based on the estimated SF_6 requirement and a maximum fugitive emissions rate of one percent based on current California Code of Regulations (CCR) Title 17 CCR Sections 95350 et seq., and a GWP of 22,800 for SF_6 compared to CO_2. The analysis also considered the reduction in carbon sequestration capacity of the project site that would result from removal of trees on site during construction and the gain of carbon sequestration capacity that would result from the subsequent planting of new trees. Additionally, the analysis considered the net GHG emissions benefit that the proposed project could contribute due to the production of energy from a GHG-free source. Appendix AQ-1 provides the detailed calculation inputs, assumptions, and outputs.

Impact CC-1: Generate Greenhouse Gas Emissions, Either Directly or Indirectly, that May have a Significant Impact on the Environment

One of the Project Objectives for the proposed project is to provide support for the attainment of the SMUD 2030 Zero Net Carbon Plan target, which aims to reach zero

carbon emissions in the SMUD power supply by 2030. As a solar energy generating facility, the proposed project would generate electricity from a GHG-free source and operational GHG emissions would be limited. However, GHGs would also be emitted as a result of short-term project construction and decommissioning activities and long-term operational activities.

Construction and Decommissioning

During construction and decommissioning, the use of off-road equipment and on-site vehicles, as well as vehicle trips (e.g., construction worker commutes and haul truck trips) to and from the site, would generate GHG emissions. As detailed in Appendix AQ-1, total construction-related GHG emissions are estimated to be approximately 7,320 MT CO_2e over the 18-month construction period and would exceed the SMAQMD construction-related threshold of 1,100 MT CO_2e per year. Decommissioning activities would generate approximately 1,853 MT CO_2e over the one-year decommissioning period and would also exceed the SMAQMD threshold of 1,100 MT CO_2e per year. This impact for construction would be potentially cumulatively considerable.

Additionally, the analysis contained in Appendix AQ-1 quantified the one-time change in carbon sequestration capacity due to the removal of trees onsite during construction. While sources have documented that harvested trees retain their stored carbon unless the wood decays or burns (WFPA 2023), the analysis conservatively used iTree to calculate the amount of CO_2 sequestered (i.e., stored) by the trees proposed to be removed during project construction. It is estimated that 26,949 MT CO_2e of carbon sequestration capacity would be lost by the removal of trees during project construction (Dudek 2025). However, as discussed in “Operation” below, a portion of the carbon sequestration capacity of the project site would be restored by new tree planting.

Operation

After construction, the proposed project would require minor operations and maintenance activities that would typically include up to 10 trips per day, but an additional 32 trips were also included to account for water being trucked in for panel washing and sheep/goat grazing activity (which would not occur daily at the site), for a conservative maximum total of 42 daily vehicle trips (Appendix AQ-1). Maximum annual GHG emissions from project operations were estimated assuming the maximum daily vehicle and equipment activity would occur year-round, which is a conservative estimate of such activity, which may only occur for periods of days to weeks throughout the year.

Operational GHG emissions estimates by emissions source are shown in Table CC-1. Total annual GHG emissions that would be generated from operations and maintenance activities would be approximately 407 MT CO_2e per year. When considering that this estimate reflects a conservative assumption of peak maintenance activities occurring year-round and does not consider future emissions reductions in vehicle and equipment operations due to increasing regulatory requirements and implementation of cleaner technology, long-term annual operations and maintenance emissions would likely be less than presented here.

These operational GHG emissions would be less than the SMAQMD de minimis screening level and the proposed project's operational emissions would not be considered to have a cumulatively considerable contribution to the significant impact of global climate change.

The proposed project would not include any natural gas infrastructure, and would therefore, be consistent with SMAQMD BMP1. Furthermore, the project is not a typical land use development that would be required to comply with CALGreen requirements, such as commercial and residential land use developments, and SMAQMD BMP2 (EV ready parking spaces). would not be applicable. Therefore, this impact for operations would be less than cumulatively considerable.

Table CC-1: Proposed Project Operational GHG Emission in the First Operational Year

Proposed Project Operational Emissions Source	Total GHG Emissions (MT CO_2e per year)
Area[1]	29.49
Energy	201.83
Mobile	47.24
Stationary	76.43
Waste	4.73
Water	0.41
Total Annual Emissions	**360.13**
SMAQMD Threshold (*de minimis*)	**1,100**
Exceed Threshold?	**No**

Source: See Appendix AQ-1 for detailed methodology, assumptions, and calculations.

Notes: GHG = Greenhouse gas; MT CO_2e = metric tons of carbon dioxide equivalents; SF_6 = sulfur hexafluoride; SMAQMD = Sacramento Metropolitan Air Quality Management District

[1] Area source emissions include fugitive SF_6 emissions at a maximum rate of 1 percent SF_6-containing switchgear and equipment.

Additionally, the planting of new trees as part of the proposed landscape plan would increase the carbon sequestration capacity of the project site, offsetting approximately 984 MT CO_2e in the first operational year. Throughout the lifespan of the project (assuming an active growing period of 30 years), carbon sequestration capacity would be gained by planting new trees (Dudek 2025).

The proposed project's contribution as a GHG-free energy resource is also important to acknowledge as a valuable long-term benefit of the proposed project. As a GHG-free energy resource, proposed project operations would serve to increase SMUD's renewable energy supply and help reduce GHG emissions associated with SMUD's power generation.

The project's 200-megawatt capacity was estimated to generate approximately 520,000 megawatt hours per year. As detailed in Appendix AQ-1, SMUD's most recently published GHG emissions intensity factor of 295 pounds of CO_2e per megawatt-hour for the year 2025 was used to calculate the proposed project's net emissions benefit for an initial operational year of 2025, assuming a linear progress of SMUD's incorporation of GHG-free energy resources into its power mix of 100 percent carbon-free energy by 2045. Thus, if the renewable electricity generated by the project were to be used instead of electricity generated by SMUD's current sources projected to the 2025 calendar year, the project would provide a potential offset of up to 69,798 MT CO_2e in the first year of operation. See Appendix AQ-1 for additional details and calculations.

The average GHG emissions intensity factor for SMUD's overall power mix will decrease over time as the percentage of renewable energy resources contributing to the power mix increases. SB 100 requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 60 percent of their supply from renewable sources by the year 2030, and 100 percent by the year 2045; SMUD's 2030 Zero Carbon Plan strategy has a target of eliminating carbon emissions from its power supply by 2030, which is more aggressive that the current regulatory requirements. As the regional power mix continues to become increasingly dominated by GHG-free energy sources, the relative GHG emissions benefit potential of the project could be considered to diminish. However, as noted in Section 3.2 of Appendix AQ-1, emissions generated by vehicle and equipment exhaust would also likely decrease over time due to increased regulatory requirements, improved (i.e., less emitting) technology, and fleet turnover. Neither these reduced emissions rates associated with operational vehicle and equipment use, nor the declining GHG intensity of the energy power source mix are accounted for over the proposed project's operational horizon, as they are speculative and do not reflect existing conditions. Although the quantifiable GHG emissions offsets would diminish over time when considering the overall shift toward a 100 percent renewable energy power mix, this does not negate the overall benefit of the project for reducing GHG emissions. The development of renewable energy sources, such as the proposed project, are a necessity to meet the State RPS requirements, realizing a 100 percent renewable energy power mix, and achieving overall state GHG emissions reduction targets, SMUD's 2030 Net Zero goal, and goals and measures in the County's CAP.

Mitigation Measures

Although the project's construction- and decommissioning-related GHG emissions and potential loss in carbon sequestration would be offset within the first year of operations through the renewable electricity generated by the project, Mitigation Measure CC-1 is included to reduce construction-related exhaust emissions.

CC-1: Implement Construction GHG Emission Best Management Practices during Construction Activities.

- Improve fuel efficiency from construction equipment by:
    - Minimizing idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 3 minutes (5-minute limit is

required by the state airborne toxics control measure [Title 13, sections 2449(d)(3) and 2485 of the CCR]). Provide clear signage that posts this requirement for workers at the entrances to the site.

- Maintaining all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.
- Training equipment operators in proper use of equipment.
- Using the proper size of equipment for the job.
- Using equipment with new technologies (repowered engines, electric drive trains).

- Perform on-site material hauling with trucks equipped with on-road engines (if determined to be less emissive than the off-road engines).
- Use alternative fuels for generators at construction sites such as propane or solar or use electrical power.
- Use CARB-approved low carbon fuel for construction equipment.
- Encourage and provide carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.
- Develop a plan to efficiently use water for adequate dust control.
- Reduce electricity use in the construction office by using compact fluorescent bulbs or light emitting diodes, powering off computers every day, and replacing heating and cooling units with more efficient ones.
- Recycle or salvage non-hazardous construction and demolition debris, when practicable (goal of at least 75% by weight).

Significance After Mitigation

Because the project would contribute GHG-free energy resource and provide a GHG emissions benefit of up to 69,798 MT CO_2e in the first year of operation, which would offset the project's construction and decommissioning GHG emissions, as well as potential loss in carbon sequestration capacity, this impact would be **less than cumulatively considerable**. Implementation of CC-1 would further reduce the potential impact.

Impact CC-2: Conflict with an Applicable Plan, Policy or Regulation Adopted for the Purpose of Reducing the Emissions of Greenhouse Gases

The project would provide a potential reduction in GHG emissions each year of operation if the electricity generated by the project's solar energy facilities were to be used instead of electricity generated by fossil-fuel sources. Several regulatory measures have been adopted to increase renewable energy in California. SB 100 requires all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators, to achieve the RPS of 60 percent renewable energy by 2030 and requires that all of the state's electricity come from carbon-free resources by 2045. The project would provide a source of renewable energy to achieve the RPS's target of 60 percent by 2030 set by SB 100 and help the state reach its mandate to be carbon neutral by 2045, assist SMUD in achieving the 2030 Net Zero goal, as well as contribute toward the 2022 Scoping Plan Update, County's General Plan, and CAP goals of reducing the reliance on non-renewable energy sources and supporting the development and use of renewable sources of energy, including but not limited to solar. The project is also consistent with the policy focus areas and measures included in the CAP, such as decarbonizing the energy supply and supporting the SMUD Zero Carbon Plan (Measure GHG-03). In addition, the proposed project would be required to comply with all current and future regulations, including CCR Title 17 CCR Sections 95350 et seq. for reducing GHG emissions from gas-insulated equipment, such as switchgears used in solar power generation facilities like the proposed project. Building construction and design would be required to comply with California's Building Energy Efficiency Standards, which are designed to reduce wasteful and unnecessary energy consumption in newly constructed buildings. The 2022 Building Energy Efficiency Standards, which were adopted on August 11, 2021, and become effective January 1, 2023, include prescriptive requirements for cool roofs and increased solar reflectance (CEC 2022), which also help reduce the urban heat island effect (EPA 2008). In addition, ground-based solar PV development is identified as an urban heat mitigation measure with local cooling benefits within the SMAQMD's Capital Region Urban Heat Island Mitigation Project (SMAQMD 2020b). Therefore, the proposed project would be consistent with, and would not conflict with applicable plans, policies, or regulations adopted for the purpose of reducing the emissions of greenhouse gases. This impact would be **less than cumulatively considerable**.