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3.10 Greenhouse Gas Emissions

This section identifies and evaluates issues related to greenhouse gas (GHG) emissions in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating the impacts, and the results of the impact assessment. The information and analysis presented in this section rely on the modeling results presented in **Appendix B**, *Air Quality and Greenhouse Gas Emissions*.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input about annual rainfall assumptions, annual average wind speed, and concerns that operation of the proposed wind turbines could result in "localized atmospheric warming" (also referred to as a "heat island effect") that would affect the snow pack and temperatures required to grow apples on property near the Project Site. The possibility also was raised that the wind turbulence of turbines located along ridge lines could impact local weather by disrupting normal air flow over ridge tops, that spinning turbine rotors increase the vertical mixing of heat and water vapor, thereby affecting downwind meteorological conditions, including rainfall.

Multiple scoping comments requested disclosure of the Project's net effect on GHGs, including any reduction of other green sources of energy production (such as local hydroelectric capacity that would have to be throttled back during the operation of the proposed turbines) and any reduction in the site's GHG sequestration capacity caused by the temporary and permanent removal of forested acres. All scoping input received, including regarding GHG emissions and climate change, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

Scoping comments also requested that the EIR provide a "cradle-to-grave" carbon life cycle analysis that factors in emissions associated with the mining, manufacture, transportation, and construction of turbines, concrete, rebar, and other materials for the Project. CEQA does not require the suggested depth of inquiry (OPR, 2017), and it is not provided here.

The California Natural Resources Agency (CNRA) has indicated that in the context of GHG emissions, (1) there exists no standard regulatory definition for "life cycle"; and (2) even if a standard definition for life cycle existed, the term might be interpreted to refer to emissions beyond those that could be considered "indirect effects" as defined by the CEQA Guidelines, and therefore, beyond what an EIR is required to estimate and mitigate (CNRA, 2009).

This reasoning was reaffirmed in Section 15126.2(b) of the November 2018 CEQA Guidelines, which cautions that the analysis of impacts is subject to the rule of reason, and must focus on energy demand (and associated GHG emissions) caused by the project, signaling that a full "life cycle" analysis that would account for energy used by industrial facilities in building materials and consumer projects generally is not be required (CNRA, 2018a).

3.10.1 Setting

3.10.1.1 Study Area

The geographic scope of impacts related to GHG emissions is global. This analysis focuses on the impacts from the Project's emissions associated with potential conflicts with California's GHG reduction targets set forth in Senate Bill (SB) 32 and SB 100, and the Project's direct and/or indirect generation of GHG emissions.

3.10.1.2 Environmental Setting

Greenhouse Gases

The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). Every GHG has its own global warming potential (GWP), which is a measurement of how much heat the GHG can trap within the atmosphere and how much of an environmental impact it is expected to have. GWPs determine the ratio of heat trapped by one unit mass of the specific GHG to that of one unit mass of CO_2 over a specified time period. The GWP factors were developed by the International Panel on Climate Change (IPCC), a United Nations–established scientific organization.

CO_2 is the most common reference gas for climate change. To account for the warming potential of different GHGs, GHG emissions often are quantified and reported as CO_2 equivalents (CO_2e). For example, SF_6 is a GHG commonly used in the utility industry as an insulating gas in circuit breakers and other electronic equipment. SF_6, while comprising a small fraction of the total GHGs emitted annually world-wide, is a much more potent GHG with 22,800 times the global warming potential as CO_2, which has a global warming potential of 1.[1] Large emission sources are reported in million metric tons of CO_2e.[2]

Impacts of Climate Change

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model it, the uncertainty surrounding the localized effects of climate change may never be completely eliminated.

[1] The California Emissions Estimator Model (CalEEMod) is the modeling software used chiefly for determining GHG emissions from CEQA projects. CalEEMod currently utilizes the global warming potentials from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4).

[2] The term metric ton is commonly used in the U.S. to refer to the metric system unit, tonne, which is defined as a mass equal to 1,000 kilograms. A metric ton is approximately 1.1 short tons and approximately 2,204.6 pounds.

The *Fourth California Climate Change Assessment* (Fourth Assessment), published in 2018, found that the potential impacts in California due to global climate change include: loss in snow pack; sea level rise; more extreme heat days per year; more high ozone days; more extreme forest fires; more severe droughts punctuated by extreme precipitation events; increased erosion of California's coastlines and seawater intrusion into the Sacramento–San Joaquin Delta and associated levee systems; and increased pest infestation (OPR et al., 2018).

Surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent in many regions. The expectation is that the ocean will continue to warm and acidify, and global mean sea level will rise. Continued human-based generation of GHGs will likely cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive, and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in GHG emissions which, together with adaptation, can limit climate change risks (IPCC, 2014).

Temperature Increase. The primary effect of adding GHGs to the atmosphere has been a rise in the average global temperature. The impact of human activities on global temperature is readily apparent in the observational record. While year-to-year variations occur due to natural variability, 2019 was 2.19°F above a pre-industrial baseline (1881–1910) temperature, and the five warmest years have occurred over the past 5-year period (Climate Central, 2020). In 2019, the average annual temperature for the contiguous U.S. was 52.7°F, 0.7°F above the 20th Century average, ranking in the warmest third of the 125-year record (NOAA, 2020). The Fourth Assessment indicates that average temperatures in California could rise 5.6°F to 8.8°F by the end of the century, depending on the global trajectory of GHG emissions (OPR et al, 2018).

Wildfires. The hotter and dryer conditions expected with climate change will make forests more susceptible to extreme wildfires. A recent study found that, if GHG emissions continue to rise, the frequency of extreme wildfires burning over approximately 25,000 acres would increase by nearly 50 percent, and the average area burned statewide each year would increase by 77 percent, by the year 2100.

Air Quality. Higher temperatures, conducive to air pollution formation, could worsen air quality in California and make it more difficult for the state to achieve air quality standards. Climate change may increase the concentration of ground-level ozone in particular, which can cause breathing problems, aggravate lung diseases such as asthma, emphysema, and chronic bronchitis, and cause chronic obstructive pulmonary disease (COPD). Emissions from wildfires can lead to excessive levels of particulate matter, ozone, and volatile organic compounds (Kenward et al., 2013).

Hydrology and Sea Level Rise. California's hydrology is already changing due to global climate shifts. The vulnerability of the water sector to climate change stems from a modified hydrology that affects the frequency, magnitude, and duration of extreme events, which in turn, affect water quantity, quality, and infrastructure. Changes in hydrology include declining snowpack, earlier snow melt, more precipitation as rain than snow, more frequent and longer droughts, more frequent and more severe flooding, changes in the timing and volume of peak runoff, and

consequent impacts on water quality and water availability. Additionally, rising sea levels will produce higher storm surges during coastal storms.

Sea levels measured at stations in San Francisco have risen at a rate of 8 inches over the century. Sea level rise in California could lead to flooding of low-lying areas, loss of coastal wetlands such as portions of the San Francisco Bay-Delta system, erosion of cliffs and beaches, saltwater contamination of drinking water, impacts on roads and bridges, and harmful ecological effects along the coastline (CNRA, 2018b).

Agriculture. Successful food crop production is closely tied to weather, which reflects the conditions of the atmosphere over a short period of time. Climate change is changing the longer-term patterns of atmospheric conditions, and the resulting impacts are expected to worsen over the next century. Climate impacts like unpredictable water availability, rising minimum and maximum temperatures, extended heat waves, changes in the prevalence of plant and livestock pests and diseases, and impacts to beneficial species directly affect agricultural food crop and livestock production. This poses a significant threat to California farms, which grow over 33 percent of the vegetables and two-thirds of the fruits and nuts in the U.S. (CNRA, 2018b).

Ecosystem and Biodiversity Impacts. Climate change impacts on ecosystems and biodiversity are being observed in alteration of the timing of critical biological events such as spring bud burst and substantial range shifts of many species. In the longer term, there is an increased risk of species extinction. Events such as droughts, floods, wildfires, and pest outbreaks associated with climate change can also disrupt ecosystems (Melillo et al., 2014).

Human Health Impacts. Global climate change also is anticipated to result in more extreme heat events (OPR et al., 2018). These extreme heat events increase the risk of death from dehydration, heart attack, stroke, and respiratory distress, especially with people who are ill, children, the elderly, and the poor, who may lack access to air conditioning and medical assistance. A warming planet is expected to bring more severe weather events, worsening wildfires and droughts, a decline in air quality, rising sea levels, increases in allergens and in vector-borne diseases, all of which present significant health and wellbeing risks for California populations (CNRA, 2018b).

Greenhouse Gas Emissions Estimates

Global Emissions

Total global annual GHG emissions, including from land-use change, reached a record high of 55.3 gigatons (Gt) CO_2e in 2018, an increase of 3.4 Gt CO_2e compared with 2017. GHG emissions have risen at a rate of 1.5 percent per year in the last decade, stabilizing only briefly between 2014 and 2016 (UN Environment, 2019).

U.S. Emissions

In 2018, the United States emitted about 6.68 billion tons of CO_2e, representing a 2.9 percent increase from 2017. The increase in total GHG emissions between 2017 and 2018 was driven largely driven by an increase in CO_2 emissions from fossil fuel combustion. CO_2 accounts for approximately 82 percent of GHG emissions. The increase in CO_2 emissions from fossil fuel

combustion was a result of multiple factors, including increased energy consumption from greater heating and cooling needs due to a colder winter and hotter summer in 2018 (in comparison to 2017).

Of the five major sectors nationwide—residential and commercial, industry, agriculture, transportation, and electricity—transportation accounts for the highest fraction of GHG emissions (approximately 28 percent), closely followed by the electric power industry (approximately 27 percent), and general industry (approximately 22 percent). Total emissions from the electric power sector have decreased by 3.4 percent since 1990, and the carbon intensity of the electric power sector has decreased by 13 percent during that same time frame. Between 1990 and 2018, renewable energy generation (in kilowatt-hours) from solar and wind energy have increased from 0.1 percent in 1990 to 8 percent of total electricity generation in 2018, which helped drive the decrease in the carbon intensity of the electricity supply in the U.S. (USEPA, 2020).

State of California Emissions

In 2017, California emitted approximately 424 million tons of CO_2e, representing a 1.2 percent decrease from 2016. For the first time since California started to track GHG emissions, electricity generation from zero-GHG sources, including solar, hydroelectric, wind, and nuclear, exceeded generation from GHG-emitting sources. The transportation sector remains the largest source of GHG emissions in the State and saw a one percent increase in emissions in 2017; however, this represents the lowest growth rate for this sector over the past 4 years.

The latest California Air Resources Board (CARB) inventory also reports that transportation is the source of approximately 41 percent of the state's GHG emissions, followed by industrial sources at 24 percent, and electricity generation (both in-state and out-of-state) at 15 percent. Emissions from the electricity sector showed another large (9 percent) reduction in emissions in 2017 from approximately 68.3 to 62.3 million tons of CO_2e due to a large increase in renewable energy. Residential and commercial activity is the source of about 12 percent of California's GHG emissions and agriculture is the source of approximately 8 percent of California's GHG emissions (CARB, 2019).

Shasta County Emissions

Shasta County completed a baseline GHG emissions inventory as a part of its regional climate action planning process. In 2008, Shasta County generated a total of approximately 4.48 million metric tons of CO_2e (MT CO_2e) emissions. Stationary sources (e.g., cement plants, lumber mills, biomass generation facilities) were the highest source of emissions countywide contributing approximately 54 percent of the total emissions, followed by transportation emissions (19 percent) and energy-related emissions (14 percent). When agriculture, forestry, and stationary source emissions are removed, as the County does not have authority to influence these activities, the 2008 countywide jurisdictional inventory was reduced to 1.76 million MT CO_2e. In the jurisdictional-only inventory, transportation emissions contributed approximately 48 percent of total emissions and energy-related emissions were approximately 37 percent.

In 2008, the unincorporated areas of Shasta County, where the Project Site is located, generated a total of approximately 3.13 million MT CO_2e, with the stationary sources being the largest source of emissions at 72 percent of total emissions, followed by transportation (8 percent), energy (7 percent), forestry (5 percent), and agriculture emissions (4 percent). When the agriculture, forestry, and stationary source sectors are removed in the jurisdictional inventory, baseline emissions dropped considerably to approximately 0.57 million MT CO_2e. In the jurisdictional-only inventory, the transportation and energy sectors were the largest emissions sources at 43 percent and 36 percent, respectively (Shasta County, 2012).

3.10.1.3 Regulatory Setting

Federal

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

GHGs fit within the Clean Air Act's definition of a pollutant and are regulated by the USEPA. On December 7, 2009, the USEPA Administrator signed two findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- **Endangerment Finding:** The current and projected concentrations of 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.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, the USEPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required the USEPA to develop "…mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy." The Reporting Rule applies to most entities that emit 25,000 metric tons of CO_2e or more per year. The Project would not reach this threshold.

Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards

In 2014 the USEPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) established a program that reduces GHG emissions and improves fuel economy for all new cars and trucks sold in the U.S. The program required manufacturers to build a fleet that meets all federal and State requirements with an end target fuel economy of 54.5 miles per gallon by model year 2025. In January 2017, USEPA issued its Mid-Term Evaluation of the GHG emissions standards, finding that it would be practical and feasible for automakers to meet the model year 2022 to 2025 standards through a number of existing technologies.

In August 2018, the USEPA revised its 2017 determination, and issued a proposed rule that maintains the 2020 Corporate Average Fuel Economy (CAFE) and CO_2 standards for model years

2021 through 2026 (83 Fed. Reg. 42986). The estimated CAFE and CO_2 standards for model year 2020 are 43.7 miles per gallon (mpg) and 204 grams of CO_2 per mile for passenger cars and 31.3 mpg and 284 grams of CO_2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. On May 1, 2018, California, joined by 16 other states and the District of Columbia, filed a petition challenging the USEPA's proposed rule to revise the vehicle emissions standards, arguing that the USEPA had reached erroneous conclusions about the feasibility of meeting the existing standards. On October 25, 2019, the D.C. Circuit dismissed the challenges, concluding that it did not have jurisdiction to consider the US EPA's withdrawal of the Obama administration's mid-term determination that model year 2022 to 2025 GHG emission standards promulgated in 2012 remained appropriate. The court noted that the withdrawal did not itself change the emission standards established in 2012 but only created the possibility that the standards could be modified in the future, similar to an agency's grant of a petition for reconsideration of a rule.[3] Accordingly, due to the uncertainty of future federal regulations, this analysis assumes that the existing CAFE standards will remain in place.

State

Executive Order S-3-05

In 2005, in recognition of California's vulnerability to the effects of climate change and information from the IPCC, Governor Arnold Schwarzenegger issued Executive Order S-3-05 (EO S-3-05), which announced goals for statewide GHG emission reductions and target dates by which those goals should be met. These included a reduction of GHG emissions to 2000 levels by 2010; a reduction of GHG emissions to 1990 levels by 2020; and a reduction of GHG emissions to 80 percent below 1990 levels by 2050.

As discussed below, the 2020 reduction target was codified in 2006 as Assembly Bill 32. However, the 2050 reduction target has not been codified and the California Supreme Court has ruled that CEQA lead agencies are not required to use it as a significance threshold. *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497.

Assembly Bill 32 and the California Climate Change Scoping Plan

In 2006, the California Legislature enacted Assembly Bill 32 (Health and Safety Code §38500 et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 required CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels (i.e., 427 million metric tons CO_2e) by 2020 (representing a 25 percent reduction in emissions). AB 32 anticipated that the GHG reduction goals will be met, in part, through local government actions.

Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008 (CARB, 2009), which was re-approved by CARB on August 24, 2011, that outlines measures to meet the 2020 GHG reduction target. To meet this target, California had to reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels or about 15 percent from 2008 levels.

[3] The State of California's May 1, 2018 petition, the October 25, 2019 decision by the U.S. Court of Appeals for the D.C. Circuit, and other materials in the docket for Case No. 18-1114 are available online: http://climatecasechart.com/case/california-v-epa-4. Accessed December 10, 2019.

The Scoping Plan recommended measures for further study and possible State implementation, such as new fuel regulations. It estimated that a reduction of 174 million metric tons of CO_2e (about 191 million U.S. tons) from the transportation, energy, agriculture, and forestry sectors and other sources could be achieved should the State implement all of the measures in the Scoping Plan. CARB noted that successful GHG emission reductions would rely in part on local governments' land use planning and urban growth decisions, as addressed by SB 375, discussed below. The AB 32 emissions reduction target was achieved in 2017, 3 years prior to the 2020 goal.

The Scoping Plan is required by AB 32 to be updated at least every 5 years. The most recent scoping plan update, the 2017 Scoping Plan Update, was adopted on December 14, 2017. It addressed the 2030 target established by SB 32, as discussed below, and established a proposed framework of action for California to meet a 40 percent reduction in GHG emissions by 2030 compared to 1990 levels. The key programs that the Scoping Plan Update builds on include increasing the use of renewable energy in the state, the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and reduction of methane emissions from agricultural and other wastes (CARB, 2017).

Executive Order B-30-15 and Senate Bill 32

California Executive Order B-30-15 (April 29, 2015) set an "interim" statewide emission target to reduce GHG emissions to 40 percent below 1990 levels by 2030, and directed State agencies with jurisdiction over GHG emissions to implement measures pursuant to statutory authority to achieve this 2030 target. Specifically, the Executive Order directed CARB to update the Scoping Plan to express this 2030 target in metric tons. On September 8, 2016, Governor Jerry Brown signed SB 32, which codified the 2030 reduction target called for in Executive Order B-30-15. CARB's 2017 Scoping Plan update addressed the 2030 target, as discussed above (CARB, 2017).

Senate Bill 605

On September 21, 2014, Governor Jerry Brown signed SB 605, which required CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state no later than January 1, 2016. As defined in the statute, short-lived climate pollutant means "an agent that has a relatively short lifetime in the atmosphere, from a few days to a few decades, and a warming influence on the climate that is more potent than that of carbon dioxide." SB 605, however, does not prescribe specific compounds as short-lived climate pollutants or add to the list of GHGs regulated under AB 32. In developing the strategy, CARB completed an inventory of sources and emissions of short-lived climate pollutants in the state based on available data, identified research needs to address any data gaps, identified existing and potential new control measures to reduce emissions, and prioritized the development of new measures for short-lived climate pollutants that offer co-benefits by improving water quality or reducing other air pollutants that impact community health and benefit disadvantaged communities.

Senate Bill 375

In addition to policy directly guided by AB 32, the California Legislature in 2008 enacted SB 375, which provides for regional coordination in land use and transportation planning and funding to help meet the AB 32 GHG reduction goals. SB 375 aligns regional transportation

planning efforts, regional GHG emissions reduction targets for light duty vehicles, and land use assumptions in General Plans, and housing allocations. SB 375 requires Regional Transportation Plans (RTPs) developed by the state's 18 metropolitan planning organizations (MPOs) to incorporate sustainable communities strategies (SCS) that will achieve GHG emission reduction targets set by CARB and coordinate regional housing and transportation. Shasta Regional Transportation Agency (SRTA) is the federally recognized metropolitan planning organization (MPO) for the Shasta County region.

The *2018 Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region* was adopted by the SRTA Board of Directors on October 9, 2018 (SRTA, 2018a). The RTP/SCS lays out how the region will meet certain GHG reduction targets. Pursuant to SB 375, CARB established emission reduction targets for California's 18 MPO regions for the years 2020 and 2035. Shasta County was assigned a zero percent per capita change for its two targets when compared to the 2005 baseline year. The 2018 RTP meets these targets as a result of integrated land use, housing, and transportation planning. The SCS features seven Strategic Growth Areas (SGAs) where various strategies are focused to reduce per capita vehicle miles traveled and associated GHG emissions. Strategies are intended to increase population and employment density within SGAs and to provide a range of practical mobility alternatives.

On March 22, 2018, CARB revised the Shasta Region's reduction target to four percent for both 2020 and 2035. However, these revised targets will apply to the 2022 RTP update cycle (SRTA, 2018a).

Senate Bill 1368

SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (CPUC) to establish a GHG emissions performance standard for baseload generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) also was required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC. The Project, as a renewable energy generation facility, complies with the GHG EPS requirements of SB 1368.

Renewables Portfolio Standards

The State of California adopted standards to increase the percentage that retail sellers of electricity, including investor-owned utilities and community choice aggregators, must provide from renewable resources. The standards are referred to as the Renewables Portfolio Standards (RPS). Qualifying renewables under the RPS include bioenergy such as biogas and biomass, small hydroelectric facilities 30 megawatt (MW) or less, wind, solar, and geothermal energy. The CPUC and the CEC jointly implement the RPS program. The CPUC's responsibilities include: (1) determining annual procurement targets and enforcing compliance; (2) reviewing and approving each investor-owned utility's renewable energy procurement plan; (3) reviewing

contracts for RPS-eligible energy; and (4) establishing the standard terms and conditions used in contracts for eligible renewable energy (CPUC, 2020).

Senate Bill 350

SB 350, known as the Clean Energy and Pollution Reduction Act of 2015, was enacted on October 7, 2015, and provides a new set of objectives in clean energy, clean air, and pollution reduction by 2030. The objectives include the following:

1. Increase the procurement of the state's electricity from renewable sources from 33 percent to 50 percent by December 31, 2030.
2. Double the energy efficiency savings in electricity and natural gas for final end uses of retail customers through energy efficiency and conservation.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100, establishing that 100 percent of all electricity in California must be obtained from renewable and zero-carbon energy resources by December 31, 2045. SB 100 also creates new standards for the RPS goals that were established by SB 350 in 2015. Specifically, the bill increases required energy from renewable sources for both investor-owned and publicly owned utilities from 50 percent to 60 percent by 2030. Incrementally, these energy providers are also required to have a renewable energy supply of 33 percent by 2020, 44 percent by 2024, and 52 percent by 2027. The updated RPS goals are considered achievable, since many California energy providers are already meeting or exceeding the RPS goals established by SB 350.

On the same day that SB 100 was signed, Governor Brown signed Executive Order B-55-18 with a new statewide goal to achieve carbon neutrality (zero-net GHG emissions) by 2045 and to maintain net negative emissions thereafter.

Forest Carbon Plan

In 2018, the Forest Climate Action Team, made up of California agencies including the California Natural Resources Agency, the California Environmental Protection Agency, and the California Department of Forestry, and Fire Protection (CAL FIRE), prepared the Forest Carbon Plan. The Forest Carbon Plan describes forest conditions across California and provides a projection of future conditions given the ongoing and expected impacts of climate change. The plan also describes goals and related specific actions to improve overall forest health, enhance carbon storage resilience, increase sequestration, and reduce GHG emissions, and provides principles and policies to guide and support those actions. A key finding of the plan is that reducing carbon losses from forests, particularly the extensive carbon losses that occur during and after extreme wildfires in forests and through uncharacteristic tree mortality, is essential to meeting the State's long-term climate goals (Forest Climate Action Team, 2018).

17 Cal. Code Regs. Section 95350 et seq.

The purpose of this regulation is to achieve GHG emission reductions by reducing SF_6 emissions from gas-insulated switchgear. Owners of such switchgear must not exceed maximum allowable

annual emissions rates, which are reduced each year until 2020, after which annual emissions must not exceed 1.0 percent. Owners must regularly inventory gas-insulated switchgear equipment, measure quantities of SF_6, and maintain the applicable records for at least 3 years. Additionally, by June 1st each year, owners must submit an annual report to CARB's Executive Officer for emissions that occurred during the previous calendar year.

Local

Shasta Regional Climate Action Plan

In 2010, the Shasta County Air Quality Management District (AQMD) initiated the regional climate action planning (RCAP) process. The primary objectives of the RCAP process are to contribute to the State's climate protection efforts and includes emission reduction measures. Chapter 2 of the RCAP serves as the Climate Action Plan (CAP) for the unincorporated areas within the County, including the Project Site.

Unincorporated Shasta County's GHG reduction targets are as follows:

1. Reduce community emissions to 15 percent below 2008 levels by 2020 (i.e., 485,567 MT CO_2e/yr).
2. Reduce community emissions to 49 percent below 2008 levels by 2035 (i.e., 291,340 MT CO_2e/yr).
3. Reduce community emissions to 83 percent below 2008 levels by 2050 (i.e., 97,113 MT CO_2e/yr).

The RCAP describes measures that can achieve the 2020 reduction target and work toward the 2035 target. Focus on the 2050 reduction target was reserved for future reevaluation of long-term GHG reduction efforts to reflect future conditions and adjustment of emission reduction measures accordingly. The RCAP relies on the State RPS goals that will lead to an increase in renewable electricity, reduce the community energy-related emissions in unincorporated Shasta County, and make it easier for the community to achieve 2020 and 2035 emission reduction goals (Shasta County, 2012). While the RCAP was not ultimately adopted by the Shasta County AQMD Board, it was designed to set GHG emissions reduction targets consistent with AB 32 and CARB's adopted Scoping Plan.

3.10.2 Significance Criteria

A project would result in a significant impact to GHG emissions if it would:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

3.10.3 Direct and Indirect Effects

3.10.3.1 Methodology

Neither CEQA Guidelines Section 15064.4 nor any other law requires or endorses a specific analytical methodology or quantitative criteria for determining the significance of GHG emissions.[4] Rather, lead agencies are to make a "good faith effort" to "describe, calculate or estimate" GHG emissions and to consider the extent to which the project would: increase or reduce GHG emissions; exceed a locally applicable threshold of significance; or comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions." A project may be found to have a less-than-significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (14 Cal. Code Regs. §15064[h][3]).

As noted in the Regulatory Setting above, the RCAP includes a GHG emission inventory and forecast, emission reduction measures, and an implementation and monitoring program for unincorporated Shasta County, and was finalized in 2012. However, the RCAP was not ultimately adopted by the Shasta County AQMD Board. The RCAP also does not provide specific reduction targets or CEQA significance thresholds for individual development projects. Therefore, while the RCAP is discussed in this analysis with regard to consistency with plans, the RCAP is not used to determine the impact of Project GHG emissions.

Other prominent air districts in northern California, such as the Bay Area Air Quality Management District and the Sacramento Metropolitan Air Quality Management District, have established project-level thresholds of 1,100 MT CO_2e per year (BAAQMD, 2017; SMAQMD, 2018). In addition, the California Air Pollution Control Officers Association (CAPCOA) recommended an interim 900 MT CO_2e per year screening level as a theoretical approach to identify projects that require further analysis and potential mitigation (CAPCOA, 2008). However, these quantitative thresholds were developed to address land use development projects and stationary sources of GHG emissions, and do not directly apply to the proposed wind power generation Project.

Because an adopted quantitative threshold does not apply to this Project, and since the Project by its nature of renewable energy generation would result in an offset of GHG emissions, this analysis uses a no net annual increase of GHG emissions threshold to determine whether the Project's GHG emissions would be significant. GHG emissions from construction and decommissioning, operational emissions, the loss of carbon sequestration capacity from tree removal, and the offset of emissions from fossil-fuel powered energy sources were combined to determine whether the Project would result in a net increase in GHG emissions.

[4] See *Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal.4th 204 (identifying three "potential options" for lead agencies evaluating cumulative significance of a proposed land use development's GHG emissions and explicitly stating that none of the three options came with a "guarantee" that it would be sufficient if later challenged.)

As a conservative estimate, GHG emissions include construction emissions annualized over the 40-year life of the Project, as well as operational emissions. Construction emissions can be amortized over a project lifetime, so that GHG reduction measures can address construction GHG emissions as part of the operational GHG reduction strategies. Other prominent air districts in northern California, such as the Bay Area Air Quality Management District and the Sacramento Metropolitan Air Quality Management District, have provided estimates for the operational life of buildings ranging from 25 to 40 years (BAAQMD, 2017; SMAQMD, 2018). However, the operational life of a wind energy facility may not coincide with the operational life of a building. As discussed in Chapter 2, *Project Description*, although upgrading and replacing equipment could extend the operating life of the wind energy facility indefinitely, for CEQA purposes, the life of the Project would be coterminous with the term of the use permit that is requested for its operation, i.e., 40 years. Therefore, the construction GHG emissions in this analysis are amortized over 40 years to consider the impact over the duration of the Project's initially permitted time frame. Any proposed extension of the term of the use permit would require approval of a use permit amendment and would be subject to subsequent environmental review. Decommissioning and site reclamation emissions are assumed to be equivalent to construction emissions and are also annualized over the 40-year life of the Project.

The potential loss of sequestration capacity from tree removal and offset of emissions from fossil-fuel powered energy sources are also considered for the Project in determining whether there would be a net increase in GHG emissions as a result of the Project. The CalEEMod forestland carbon biogenic emissions rate was used to estimate the potential loss of sequestration capacity. Other methodologies to estimate carbon sequestration, such as that contained in CARB's *Compliance Offset Protocol U.S. Forest Projects*, were considered, but may require on-site plot sampling to determine actual on-site carbon inventories (CARB, 2015). Thus, CalEEMod values for forestland with trees were used to calculate sequestration capacity which is more generalized, but results in conservative modeling. The potential offset of emissions from fossil-fuel powered energy sources was estimated using a value developed by CARB representing the GHG reduction resulting from the displacement of generation from the grid by renewable resources (CARB, 2010).

The potential for the Project to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG was assessed by examining any potential conflicts of the Project with the GHG reduction measures related to implementation of SB 32, including the potential conflict with CARB's *Climate Change Scoping Plan* and RPS-related goals.

3.10.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

Impact 3.10-1: The Project would generate GHG emissions, directly and indirectly. (*Less-than-Significant Impact*)

Construction, operation, and decommissioning of the Project would generate GHG emissions. The use of fossil fuels in construction equipment and motor vehicles would generate GHGs such as CO_2, methane, and nitrous oxide. During the operations and maintenance period, the Project

would generate GHG emissions primarily from motor vehicle use by commuting workers, fugitive emissions from equipment containing SF_6 gas, emergency generator testing, and O&M building electricity use, solid waste generation, and water use. See Section 3.3, *Air Quality*, Impacts 3.3-2a and 3.3-2b, for a discussion of methodology used to calculate emissions from construction equipment and motor vehicle use. O&M building electricity use, solid waste generation, and water use-related emissions were estimated using default emission factors from the CalEEMod model.[5] Helicopter emissions that would be associated with conductor line stringing for the overhead collection system and transmission line connection were estimated manually using emissions factors obtained from The Climate Registry (TCR, 2019).

Construction, Decommissioning, and Site Reclamation

Project construction is expected to last up to 24 months, but no work would occur during the winter months (i.e., January 1 through March 31). Year 1 construction activities would include timber removal and grubbing, grading and access road work, temporary concrete batch plant construction, and foundation work. Year 2 construction activities would include turbine and transformer installation, substation and O&M building installation, underground and overhead connector system work, the transmission line connection, and substation aggregate and security fencing installation. Sources of GHG emissions would include off-road equipment, a helicopter, and on-road vehicles (e.g., haul trucks and worker vehicles). Project construction would also require water for dust control, to batch concrete, emergency fire suppression, and for other activities. Water used during construction would generate indirect GHG emissions through the consumption of electricity associated with water supply. **Table 3.10-1**, *Estimated Construction Greenhouse Gas Emissions*, presents construction emissions for the Project for construction Year 1, Year 2, and construction water use from on-site and off-site emission sources. It is assumed that Project decommissioning and site reclamation emissions would result in a similar amount of emissions as described in Table 3.10-1 for the construction activities. Additional details on calculations can be found in Appendix B.

TABLE 3.10-1
ESTIMATED CONSTRUCTION GREENHOUSE GAS EMISSIONS

Year and Activity	CO_2e (metric tons)
Year 1	5,106
Year 2	4,687
Water Use	17
Total	**9,810**
Amortized Annual Emissions over 40 Years	245

NOTES: Columns may not total precisely due to rounding.
CO_2e = carbon dioxide equivalent

SOURCE: Appendix B

[5] Since CalEEMod does not have demand factors specifically for wind O&M facilities, emissions were calculated using demand factors for a heavy industrial type building. This is a conservative assumption as the demand factors assume a high number of employees and the manufacturing of large items.

Construction emissions can be amortized over a project lifetime, so that GHG reduction measures can address construction GHG emissions as part of the operational GHG reduction strategies. The life of the Project is assumed to be the same as the term of the use permit that is required for its operation, i.e., 40 years. Thus, the total construction, decommissioning, and site reclamation GHG emissions were calculated, amortized over 40 years, and added to the total operational emissions for comparison with the GHG significance threshold of no net annual increase in GHG emissions as a result of the Project.

As shown in Table 3.10-1, the estimated total GHG emissions during Project construction would be approximately 5,106 MT CO_2e in Year 1, 4,687 MT CO_2e in Year 2, and 17 MT CO_2e from construction-related water use for a total of 9,810 MT CO_2e over the up to 21-month construction period (2 years with no construction in January through March). Estimated Project-generated construction emissions amortized over 40 years, would be approximately 245 MT CO_2e per year.

GHG emissions generated during construction of the Project would be short-term in nature, and would not represent a long-term source of GHG emissions. Emissions associated with decommissioning and site reclamation of the Project were conservatively assumed to be the same as those from construction, 245 MT CO_2e per year, and so also would not represent a long-term source of GHG emissions. This is a conservatively assumption, as some construction activities such as tree removal and grading for access roads would not be required during decommissioning activities. The total amortized construction, decommissioning, and site reclamation GHG emissions were added to the total operational emissions for comparison with the GHG significance threshold of no net increase in GHG emissions (see below).

Operation and Maintenance

Operation and maintenance of the Project would generate GHG emissions through worker motor vehicle trips to and from the Project site; emergency generator testing, energy use (electricity consumed by the Project, as required when the Project is not powered by on-site energy generation); cranes used to access turbines for maintenance work; mowers used for maintenance; solid waste disposal; SF_6 leaked from circuit breakers at the proposed substation site; and consumption of electricity associated with water supply. The annual GHG emissions calculations are based on the operational assumptions presented in Appendix B.[6]

SF_6 has a high global warming potential and is used for insulation in electric power transmission and distribution equipment. During operation and maintenance, one of the sources of GHG emissions would be fugitive emissions from equipment containing SF_6 gas installed at the proposed substation. Based on an approved substation of similar voltage that will have a combined SF_6 capacity of 289 pounds (CPUC, 2018), it is conservatively assumed that this equipment would use up to 1,000 pounds of SF_6 with a leak rate of 0.5 percent. This leak-rate is less than allowed under CARB's *Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear* (17 Cal. Code Regs. §95350 et seq.), which requires that annual emissions of SF_6 must not exceed 1.0 percent after 2020; however, the new equipment would be required to comply with the International Electrotechnical Commission standard for new

[6] Since CalEEMod does not have demand factors specifically for wind O&M facilities, emissions were calculated using demand factors for a heavy industrial type building, as shown in the CalEEMod output.

equipment leakage, which is 0.5 percent per year (USEPA, 2017). Thus, annual SF_6 emissions leaked would be approximately 5 pounds per year, or approximately 52 MT CO_2e.

As shown in **Table 3.10-2**, *Estimated Annual Operational Greenhouse Gas Emissions*, estimated annual Project-generated GHG emissions would be approximately 318 MT CO_2e per year as a result of Project operation. Estimated annual Project-generated operational emissions and amortized Project construction, decommissioning, and site reclamation emissions would be approximately 809 MT CO_2e per year.

TABLE 3.10-2
ESTIMATED ANNUAL OPERATIONAL GREENHOUSE GAS EMISSIONS

Emission Source	CO_2e
Commuting workers	137
Emergency Generator Testing	10
O&M Building Electricity Use and Solid Waste	17
Cranes and Mowers Used for Maintenance	96
Fugitive Emissions (SF_6)	52
Water Use	5
Total Operation	**318**
Amortized Annual Construction Emissions over 40 Years	245
Amortized Annual Decommissioning and Site Reclamation Emissions over 40 Years	245
Total Operation and Construction	**809**
Amortized Loss of Carbon Sequestration over 40 Years	1,977
Displaced use of traditional energy source per year	-227,917
Total Net Emissions	**-225,131**

NOTES: Columns may not total precisely due to rounding; co_2e = carbon dioxide equivalent; O&M Building includes electricity and solid waste.

SOURCE: Appendix B

The Project would result in the permanent conversion of up to 713 acres of timberland to develop power generation facilities that would be used for the duration of the Project's operational time frame. Based on the CalEEMod forestland carbon biogenic emissions rate of 111 MT CO_2/acre, the Project could result in a loss of approximately 79,143 MT CO_2 of carbon sequestration capacity or approximately 1,977 MT CO_2 per year amortized over the life of the Project.[7] However, as discussed in Chapter 2, *Description of the Project and Alternatives*, all timber within the permanent and temporary disturbance areas, including the areas to be replanted after construction, would continue to grow and would not be affected by operation of the Project. The permanent disturbance area also would be revegetated upon completion of the Project's operational life to be as similar to preconstruction conditions as possible. In coordination with the

[7] Tree removal and associated loss of CO_2 sequestration is considered to result in a one-time carbon-stock change. This value has been amortized to consider the impact over the duration of the Project's operational time frame.

land owner, disturbed areas would be replanted with trees. The goal of site revegetation would be to develop a vegetation cover, composition, and diversity similar to the area's ecological setting and consistent with the landowner's current and future land use practices.

Renewable energy offsets GHG emissions generated by fossil-fuel power plants to the extent that it serves demand that otherwise would be served with a fossil-fuel powered source. For the most part, the power being displaced would be comprised of incremental power provided by generators to address load changes, which is typically provided by natural gas power plants. According to CARB, each MWh of wind generation could displace approximately 830 pounds CO_2e or 0.38 MT CO_2e from natural gas peaking plants (CARB, 2010). As discussed in Section 3.7, *Energy*, using the Project's total nameplate generating capacity of up to 216 MW and conservatively assuming an average capacity factor of 32 percent, the Project is anticipated to generate up to approximately 605,491 MWh per year. Thus, the Project would provide a potential net offset of 227,917 MT CO_2e per year[8] if the electricity generated by the Project were to be used in place of electricity generated by fossil-fuel sources. After accounting for the annualized construction and decommissioning, and annual operational emissions of 809 MT CO_2e per year, and the annualized loss of carbon sequestration capacity during the Project's operational time frame, the Project would provide a potential net offset of 225,131 MT CO_2e per year. Therefore, the Project would not result in net increase in GHG emissions, and the impact would be less than significant. Overall, this would be a beneficial impact.

Mitigation: None required.

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b) Whether the Project would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

Impact 3.10-2: The Project could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (*Less-than-Significant Impact*)

Consistency with State GHG Reduction Targets and RPS Goals

The Project would involve the construction, operation and maintenance, and decommissioning and site reclamation of a wind power facility that would produce a new renewable source of energy in Shasta County. Therefore, the Project would directly support the 40 percent reduction in GHG emissions by 2030 target under the 2017 Scoping Plan Update and targets of SB 100 for increasing California's procurement of electricity from renewable sources to 60 percent by 2030 and to 100 percent by 2045. Because carbon-free energy is a pivotal element of achieving statewide GHG reductions, the Project would also provide direct support to Executive Order B-55-18 and the new statewide goal of achieving carbon neutrality (zero net GHG emissions) by 2045 and maintaining net negative emissions thereafter.

[8] 605,491 MWh * (830 lbs CO_2e per MWh/2,205 lbs per MT) = 227,917 MT

The RCAP[9] relies on compliance with the RPS standard of 33 percent by 2020, as a part of State actions that would reduce communitywide GHG emissions supporting a 49 percent GHG reduction target by 2035. Therefore, the Project would directly support the emission reduction goals of the RCAP and facilitate exceeding the reduction projections related to RPS from the RCAP. Additionally, while the RCAP deferred adjustment of emission reduction measures related to the 83 percent reduction target by 2050, the Project would directly support meeting this reduction target through contributing to meet new RPS goals since publication of the RCAP. Because the development of the RCAP, the State has increased its RPS goal to 100 percent by 2045 through SB 100 as described above. The Project would help the State to meet that target.

Consistency with the Regional Sustainable Communities Strategy

If the Project were to be found inconsistent with the SRTA 2018 RTP/SCS based on a qualitative assessment of the Project's consistency with SRTA's Sustainable Communities Strategy policies, there could be a conflict with a GHG reduction plan. The GHG emission reduction goals in the SRTA 2018 RTP/SCS are based on demographic data trends and projections that include household, employment, and total population statistics. Because the Project does not propose housing, and would not result in a population increase, only the Project's contribution to employment would need to be considered.

The STRA 2018 RTP/SCS relies on estimates that employment within the region is projected to grow to approximately 14,702 jobs in 2040, an increase of approximately 21 percent from 2015 (SRTA, 2018b). The Project construction, decommissioning, and site reclamation workforces would be temporary, lasting up to 24 months of employment, and would be expected to come from the existing construction labor pool in Shasta County. Other specialized workers may reside outside the local area. Non-local workers would stay at local hotels and commute to the Project Site. The Project is anticipated to have up to 12 full-time employees. Therefore, the additional jobs estimated by the Project would be well within the growth projections for the 2018 RTP/SCS.

Additionally, 2018 RTP/SCS strategies are intended to increase population and employment density within Strategic Growth Areas. The general area around Burney is identified as a Strategic Growth Area in the 2018 RTP/SCS. Because the Project would facilitate the opportunity for local employment in the area surrounding Burney, which would support vehicle miles travelled and associated GHG per capita emissions reductions, the Project would be consistent with the 2018 RTP/SCS. Therefore, the Project would be consistent with the SRTA 2018 RTP/SCS, and the Project would have a less-than-significant impact with regard to potential conflicts.

Consistency with the Forest Carbon Plan

The Project would result in the permanent conversion of up to 713 acres of timberland for development of power generation facilities for the duration of the Project's operational time frame. As described under Impact 3.10-1, while the Project could result in a loss of approximately 79,143 MT CO_2 of carbon sequestration capacity, the Project would offset that loss through the potential reduction of 227,917 MT CO_2e per year if the electricity generated by the Project were

[9] While the RCAP was not ultimately adopted by the Shasta County AQMD Board, it was designed to set GHG emissions reduction targets consistent with AB 32 and CARB's adopted Scoping Plan.

to be used in place of electricity generated by fossil-fuel-sourced generation. Existing commercial and pre-commercial timber would be harvested, treated, and/or removed from the Project Site to allow development of the Project. Areas that would be removed from timber production as a result of the Project would be harvested in accordance with a Timberland Conversion Permit (TCP) and Timber Harvesting Plan (THP) authorization from CAL FIRE and environmental Best Management Practices would be implemented during harvesting. The Applicant would also prepare a Project-specific Fire Prevention Plan (FPP) prior to the commencement of on-site activities that would include procedures for fire prevention and vegetation management. The landowner, separate from and independent of the Project, is also installing helicopter dip tanks throughout the leasehold to aid fire suppression, including within the Project Site.

Altogether, while the Project would result in the loss of timberland that sequesters carbon, the Project would offset the amount of carbon sequestration capacity lost during Project operation and implement an FPP in order to prevent potential extensive carbon losses that could occur during and after extreme wildfires in forests, consistent with the Forest Carbon Plan. Additionally, the Project Site would also be revegetated, including replanted with trees, upon completion of the Project's operational life to be as similar to preconstruction conditions as possible.

Consistency with Other Regulations

As described under Impact 3.10-1, during operation and maintenance, one of the sources of GHG emissions would be fugitive emissions from equipment containing SF_6 gas installed at the proposed on-site substation. The Project would comply with CARB's *Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear* (17 Cal. Code Regs. §95350 et seq.), which requires that annual emissions of SF_6 must not exceed 1.0 percent after 2020.

Conclusion

Therefore, considering the above, development of the Project would not conflict with any applicable plans, policies, or regulations adopted with the intent to reduce GHG emissions. The impact would be less than significant.

Mitigation: None required.

3.10.3.3 PG&E Interconnection Infrastructure

Upgrades to PG&E facilities to facilitate the interconnection between the Project's electrical substation and the PG&E transmission lines are anticipated to include construction and/or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, these new poles are anticipated to occur adjacent to the proposed substation and switching station. The construction equipment, workers, and vehicle trips required for upgrades to these facilities and maintenance would be minimal compared to overall Project construction and operational activities, and are captured by the Project's GHG emissions calculations. Therefore, activities associated with the PG&E interconnection infrastructure would also result in a less-than-significant impact relating to GHG emissions.

3.10.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Alternative 1, would implement the Project exclusively in that portion of the Project Site located south of SR 299: none of the up to seven turbines proposed to the north of SR 299 (turbine numbers A01 through A07) or related infrastructure would be developed. Alternative 1 could have a total nameplate generating capacity of up to 195 MW, or approximately 21 MW fewer total nameplate generating capacity as compared to the Project. The number of workers and durations of construction, operation and maintenance, and decommissioning and site reclamation would be substantially the same as for the Project, resulting in similar GHG emissions.

Alternative 1 would continue to provide a new source of renewable energy supporting SB 100 and the state's GHG reduction goals and would have less-than-significant impacts in regard to generation of GHG emissions and conflicts with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. However, the reduced generating capacity also would contribute to a reduced overall benefit in terms of GHG emissions if the electricity generated by the Project were to be used in place of electricity generated by fossil-fuel sources. Overall, Alternative 1 would result in no significant impacts to GHG emissions; and the impact conclusions would be the same as those identified for the Project.

Alternative 2: Increased Setbacks

Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, any other publicly maintained public highway or street, and of Supan Road or Terry Mill Road. This would preclude the construction of four wind turbines, as compared to the Project, potentially resulting in the loss of approximately 12 to 22.8 MW of generating capacity based on generation potential per turbine.

Under Alternative 2, the number of workers and durations of construction, operation and maintenance, and decommissioning and site reclamation would be substantially the same as for the Project, resulting in similar GHG emissions. Alternative 2 would continue to provide a new source of renewable energy supporting SB 100 and the State's GHG reduction goals and would have less-than-significant impacts in regards to generation of GHG emissions and conflicts with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. However, the reduced generating capacity also would contribute to a reduced overall benefit in terms of GHG emissions if the electricity generated by the Project were to be used in place of electricity generated by fossil-fuel sources. Overall, Alternative 2 would result in no significant impacts to GHG emissions; and the impact conclusions would be the same as those identified for the Project.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind project infrastructure would be delivered to the Project Site or constructed, operated and maintained, or decommissioned there. No construction equipment or additional vehicle trips would be made to,

from, or within the site relative to baseline conditions. Ground clearance would not occur for laydown areas; utility line rights-of-way; roads; or the collector substation, switching station, or operation and maintenance (O&M) facility. Baseline levels of carbon sequestration within the Project Site would remain unchanged by the Project, and the Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to GHG emissions. It should be noted that the No Project Alternative would not result in the same GHG reduction benefits as the Project and associated alternatives.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect relating to GHG emissions. CAL FIRE would review any future timber harvesting proposal to evaluate any potential site-specific environmental impacts.

3.10.4 Cumulative Analysis

GHG emissions are inherently a cumulative concern, in that the significance of GHG emissions is determined based on whether such emissions would have a cumulatively considerable impact on global climate change. Although the geographic scope of cumulative impacts related to GHG emissions is global, this analysis focuses on the state, the region, and this Project's direct and/or indirect generation or offset of GHG emissions. CAPCOA considers GHG impacts to be exclusively cumulative impacts, in that no single project could, by itself, result in a substantial change in climate (CAPCOA, 2008). Therefore, the evaluation of cumulative GHG impacts presented above evaluated whether the Project would make a considerable contribution to existing cumulative significant climate change impact. The Project would result in a 40-year long-term net offset of approximately 225,131 MT CO_2e per year and would not conflict with the State's GHG reduction goals.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input including concerns that operation of the proposed wind turbines could result in a heat island effect. Studies have indicated that wind turbines may alter local climate through near-surface air temperature increases downwind of the wind farm during night and early morning hours, and near-surface air temperature decreases during the rest of the day (Roy and Traiteur, 2010). Generally, based on observations from 28 wind facilities in the U.S., daytime temperature differences were small and slightly warmer and cooler, while nighttime temperature differences were larger and almost always warmer. The observation at the site with the highest number of observed-years, is 0.02°F warmer during the day and 0.52°F warmer at night (Miller and Keith, 2018).

It is important to note that wind turbines have the potential to redistribute heat already present in the atmosphere. When wind turbines are not in operation, this effect would likely cease. As discussed in Section 3.10.1.2, *Environmental Setting*, increased GHGs in the atmosphere cause a rise in the average global temperature, and average temperatures in California could rise 5.6°F to 8.8°F by the end of the century, depending on the global trajectory of GHG emissions. Thus, while the Project may contribute to localized temperature fluctuations near the Project Site, the Project would not contribute to substantial local temperature increases when compared to projections of average long-term temperature increases for California under climate change. Additionally, the Project would continue to have the potential to offset the total GHG emissions in the state and beyond, and would not contribute to further climate change-related impacts. Therefore, the Project-specific incremental impact on GHG emissions would not be cumulatively considerable.

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