3.8 GREENHOUSE GAS EMISSIONS

Greenhouse gas (GHG) emissions 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, which tend to have localized or regional impacts, GHG emissions tend to disperse more broadly. GHG emissions are more of a global concern because they have longer atmospheric lifetimes than air pollutant emissions. Therefore, the total amount and types of GHG emissions, regardless of their location, have the most substantial effect on climate change globally. Compared to worldwide emissions of GHGs, the Humboldt Wind Energy Project would not, by itself, contribute substantially to global climate change; however, cumulative emissions from many projects and plans all contribute to global GHG concentrations and the climate system.

Legislation and executive orders related to climate change in California have established a statewide context for regulating GHG emissions and climate change, despite the global nature of this issue. This section presents a summary of the existing science related to GHGs; overviews of state and local GHG emissions inventories and the existing regulatory context for GHGs; a summary of the methods used to estimate GHG emissions attributable to the proposed project; and an analysis of potential GHG emissions impacts of the project. This section considers the proposed project's cumulative contribution to the significant cumulative impact of global climate change.

3.8.1 ENVIRONMENTAL SETTING

GREENHOUSE EFFECT

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. However, infrared radiation is selectively absorbed by GHGs; 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 (human-caused) emissions of these 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 preindustrial 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 2013).

Global surface temperature has increased by approximately 1.53 degrees Fahrenheit (°F) over the last 140 years (IPCC 2013); however, the rate of increase in global average surface temperature has not been consistent. The last three decades have warmed at a much faster rate per decade (IPCC 2013).

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; the elevation of snowlines has increased, 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 2013).

PRINCIPAL GREENHOUSE GASES AND SOURCES

GHGs are present in the atmosphere naturally, are released by 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:** Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and the decay of organic waste in municipal solid waste landfills.

- **Nitrous Oxide:** Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources of nitrous oxide are agricultural soil management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. Nitrous oxide 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 GHGs, they are sometimes called high global warming potential (GWP) gases. These high-GWP gases are listed below.

    - *Chlorofluorocarbons* are used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants.

    - *Perfluorinated chemicals or perfluorocarbons* are emitted as byproducts of industrial processes and are also used in manufacturing.

    - *Sulfur hexafluoride,* a strong GHG, is used primarily as an insulator in electrical transmission and distribution systems.

    - *Hydrochlorofluorocarbons* have been introduced as temporary replacements for chlorofluorocarbons and are also GHGs.

    - *Hydrofluorocarbons* were introduced as alternatives to ozone-depleting substances in serving many industrial, commercial, and personal needs. Hydrofluorocarbons are GHGs emitted as byproducts 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 on human health. Rather, GHGs generated locally contribute to global concentrations of GHGs, which result in changes to the climate and environment.

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. The other main GHGs that have been attributed to human activity include methane, which has a GWP of 28, and nitrous oxide, which has a GWP of 265 (IPCC 2013). For example, 1 ton of methane has the same contribution to the greenhouse effect as approximately 28 tons of CO_2. 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). The concept of CO_2 equivalence (CO_2e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation. GHG emissions are typically measured in terms of pounds or tons of CO_2e, and are often expressed in metric tons (MT) of CO_2 equivalent emissions (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 Section 3.4, "Air Quality"). Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years), or long enough to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule depends on multiple variables, more CO_2 is currently emitted into the atmosphere than is stored, or "sequestered."

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 2014 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 2014).

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. Average temperatures in California have increased, leading to more extreme hot days and fewer cold nights; shifts in the water cycle have been observed, with less winter precipitation falling as snow, and both snowmelt and rainwater running off earlier in the year; sea levels have risen; and wildland fires are becoming more frequent and intense due to dry seasons that start earlier and end later (Climate Action Team 2010). Current and future climate change impacts on resource areas in California, as discussed in *Safeguarding California: Reducing Climate Risk* (CNRA 2014), are summarized briefly below.

Agriculture. Some of the specific challenges faced by the agricultural sector and farmers include more drastic and unpredictable precipitation and weather patterns; extreme weather events; significant shifts in water availability and water quality; changes in pollinator lifecycles; temperature fluctuations; increased risks from

invasive species and weeds, agricultural pests, and plant diseases; and disruptions to the transportation and energy infrastructure supporting agricultural production.

Biodiversity and Habitat. Specific climate change challenges to biodiversity and habitat include species migration, range shift, and novel combinations of species; pathogens, parasites, and disease; invasive species; extinction risks; changes in the timing of seasonal life-cycle events; food web disruptions; and threshold effects (i.e., a change in the ecosystem that results in a "tipping point" beyond which irreversible damage or loss occurs).

Energy. Specific climate change challenges for the energy sector include temperature, fluctuating precipitation patterns, increasing extreme weather events, and sea level rise. Increasing temperatures and reduced snowpack negatively affect the availability of a steady flow of snowmelt to hydroelectric reservoirs. Higher temperatures also reduce the capacity of thermal power plants since power plant cooling is less efficient at higher ambient temperatures. Natural gas infrastructure in coastal California is threatened by sea level rise and extreme storm events.

Forestry. The most significant climate change–related risk to forests is accelerated risk of wildfire and more frequent and severe droughts. Droughts have resulted in more large-scale mortalities and, combined with increasing temperatures, have led to an overall increase in wildfire risks. Increased wildfire intensity subsequently increases public safety risks, property damage, fire suppression and emergency response costs, watershed and water quality impacts, and vegetation conversions. These factors contribute to decreased forest growth, geographic shifts in tree distribution, loss of fish and wildlife habitat, and decreased carbon absorption.

Ocean and Coastal Ecosystems and Resources. Sea level rise, changing ocean conditions, and other climate change stressors are likely to exacerbate longstanding challenges related to ocean and coastal ecosystems in addition to threatening people and infrastructure located along the California coastline and in coastal communities.

Public Health. Climate change can affect public health through various environmental changes and is the largest threat to human health in the 21st century. Changes in precipitation patterns affect public health primarily through potential for altered water supplies and extreme events such as heat, floods, droughts, and wildfires. Increased frequency, intensity, and duration of extreme heat and heat waves is likely to increase the risk of mortality due to heat-related illness, as well as exacerbate existing chronic health conditions. Other extreme weather events are likely to negatively affect air quality and increase or intensify respiratory illness such as asthma and allergies.

Transportation. The transportation industry is vulnerable to climate change risks, including sea level rise and erosion, which threaten many coastal California roadways, airports, seaports, transit systems, bridge supports, and energy and fueling infrastructure. Increasing temperatures and extended periods of extreme heat threaten the integrity of the roadways and rail lines. Other forms of extreme weather events, such as extreme storm events, can negatively affect infrastructure, which can impair movement of people and goods, or potentially block evacuation routes and emergency access roads. Increased wildfires, flooding, erosion risks, landslides, mudslides, and rockslides can all profoundly affect the transportation system and pose a serious risk to public safety.

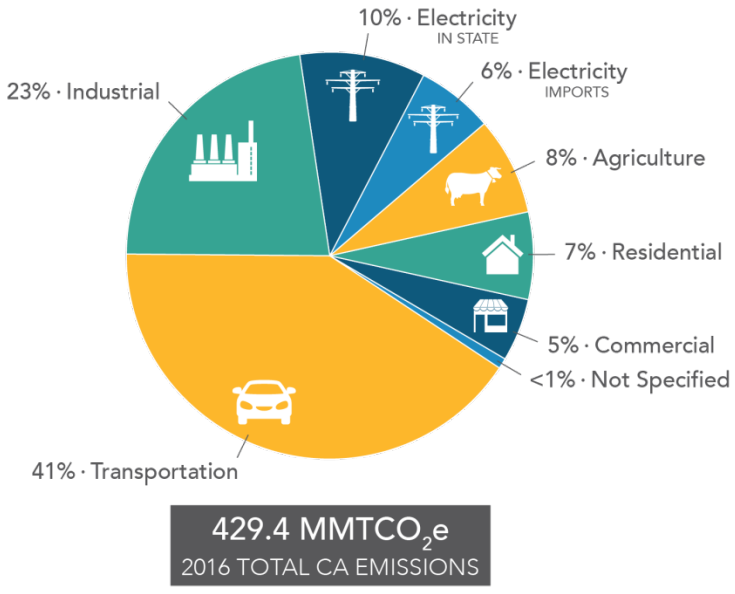
Water. Climate change could seriously affect the timing, form, amount of precipitation, runoff patterns, and frequency and severity of precipitation events. Higher temperatures reduce the amount of snowpack and lead to earlier snowmelt, which can affect water supply availability, natural ecosystems, and winter recreation. Water supply availability during the intense dry summer months is heavily dependent on the snowpack accumulated

during the wintertime. Increased risk of flooding has a variety of public health concerns including water quality, public safety, property damage, displacement, and post-disaster mental health problems. Prolonged and intensified droughts can also negatively affect groundwater reserves and result in increased overdraft and subsidence.

In March 2016, the California Natural Resources Agency (CNRA) released *Safeguarding California: Implementation Action Plans*, which shows how California is acting to convert the recommendations in the 2014 *Safeguarding California* plan into action (CNRA 2016). In addition, in May 2017, the CNRA released the draft *Safeguarding California Plan: 2017 Update*, a survey of current programmatic responses for climate change that contains recommendations for further actions (CNRA 2017). In January 2018, the CNRA released *Safeguarding California Plan: 2018 Update*, which builds on the 2017 Update and provides a roadmap for state agencies to protect communities, infrastructure, services, and the natural environment from climate change impacts. The 2018 *Safeguarding California* plan includes 69 recommendations across 11 sectors and more than 1,000 ongoing actions and next steps developed by scientific and policy experts across 38 state agencies (CNRA 2018).

STATE AND REGIONAL GREENHOUSE GAS EMISSIONS INVENTORY

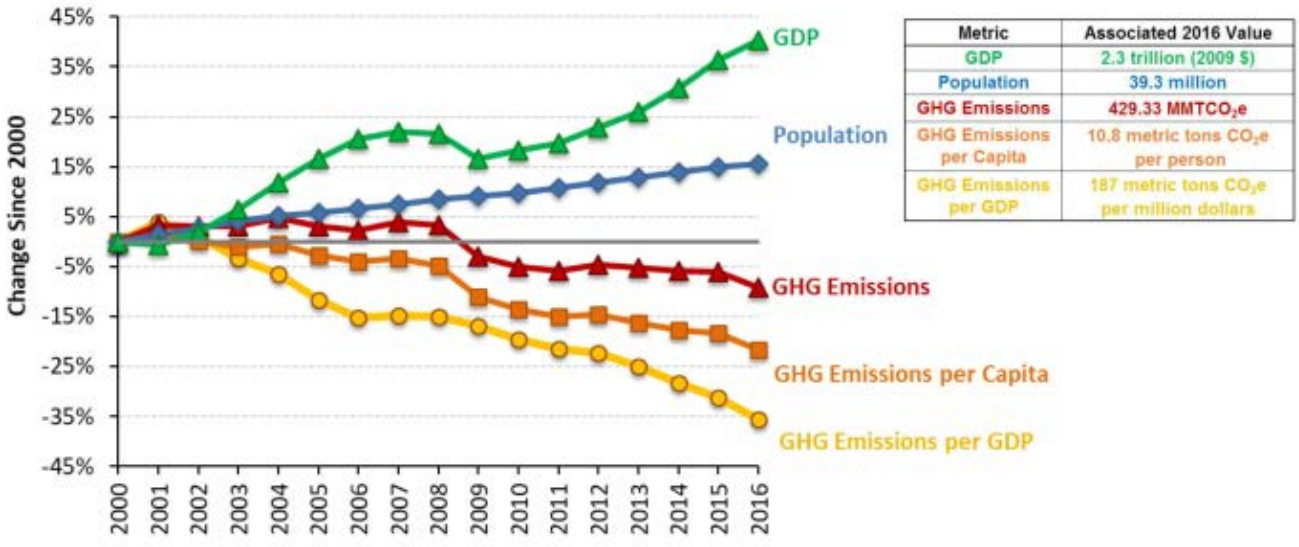
As the second largest emitter of GHG emissions in the United States and 12th to 16th largest in the world (compared to other nations), California contributes a substantial quantity of GHGs to the atmosphere (CEC 2018). The California Air Resources Board (ARB) prepares an annual inventory of statewide GHG emissions. GHGs are typically analyzed by sector, a term that refers to the type of activity. As shown in Figure 3.8-1, California produced 429.4 million metric tons (MMT) CO_2e in 2016, which just surpassed the target of reducing statewide GHGs to 431 million MT by 2020. Combustion of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2016, accounting for 41 percent of total GHG emissions. Transportation was followed by industry, which accounted for 23 percent, and then by the electric power category (both in-state and out-of-state sources), which accounted for 16 percent of total GHG emissions (ARB 2018).



Source: ARB 2018

Figure 3.8-1. 2016 California Greenhouse Gas Emissions Inventory by Economic Sector

As described below, California has implemented several programs and regulatory measures to reduce GHG emissions. Figure 3.8-2 demonstrates California's progress in achieving statewide GHG emissions reduction targets. Since 2007, California's GHG emissions have been declining; GHG emissions have continued to decline, even as population and gross domestic product have increased. Compared to 2015, California's gross domestic product increased 3 percent while emissions per gross domestic product declined by 6 percent. Per-capita GHG emissions in 2016 were 23 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 38 percent since the peak in 2001 (ARB 2018).



Source: ARB 2018

Figure 3.8-2. Trends in California Greenhouse Gas Emissions (Years 2000 to 2016)

A draft GHG inventory was developed for unincorporated Humboldt County using the Clean Air Climate Protection software package of ICLEI–Local Governments for Sustainability, including a 1990 baseline and a 2006 CEQA baseline. According to this inventory, in 2006 the total GHG emissions for unincorporated Humboldt County were an estimated 1.3 MMT CO_2e. The population of unincorporated Humboldt County was approximately 70,620, for a per capita emissions estimate of 18.4 MT CO_2e per year per person. As detailed in the current ARB Second Update to the Scoping Plan, current statewide targets are no more than 6 MT CO_2e per year per capita by 2030 and no more than 2 MT CO_2e per year per capita by 2050 to achieve the 2030 statewide target under Senate Bill (SB) 32 (described below) and the longer term state emissions reduction goal of 80 percent below 1990 levels by 2050 (ARB 2017). Similar to the overall state emissions inventory, transportation was the largest source of GHG emissions in the county, responsible for approximately 700,000 MT CO_2e. Industrial emissions were the next largest category, at 272,000 MT CO_2e. Humboldt County has seen a substantial decline in industrial emissions since 1990, which may be attributed to a decline in the lumber industry and closure of major industrial facilities related to timber processing (Humboldt County 2012). Residential and commercial energy use and waste disposal are the remaining sources of GHG emissions in the county. An update to Humboldt County's (County's) GHG emissions inventory is in progress.

3.8.2 REGULATORY SETTING

While many federal, state, regional, and local GHG-related plans, policies, and regulations do not directly apply to the proposed project, the information below is helpful for understanding the overall context for GHG emissions impacts and strategies to reduce GHG emissions.

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

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 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, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—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, EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year 2008 Consolidated Appropriations Act (House of Representatives Bill 2764; Public Law 110-161), which required EPA 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 MT CO_2e or more per year. Since 2010, facility owners have been required to submit an annual GHG emissions report with detailed calculations of the facility's GHG emissions. The Reporting Rule also mandates compliance with recordkeeping and administrative requirements to enable EPA to verify annual GHG emissions reports.

U.S. Environmental Protection Agency and National Highway Traffic Safety Administration Standards

EPA and the National Highway Traffic Safety Administration (NHTSA) implemented national GHG emission and fuel economy standards for light-duty cars and trucks in model years 2012–2016. The second phase of the standards includes GHG and fuel economy standards for model years 2017–2025. The 2017–2025 standards are anticipated to save approximately 4 billion barrels of oil and 2 billion MT of GHG emissions. In 2025, if all of the standards enacted in 2012 are met through fuel efficiency improvements, the average industry fleet-wide fuel efficiency for light-duty cars and trucks would be approximately 54.5 miles per gallon (EPA 2012). However, in 2018 the EPA and the NHTSA proposed to amend certain existing Corporate Average Fuel Economy (CAFE) and

GHG emissions standards for passenger cars and light trucks and establish new standards, covering model years 2021 through 2026. Compared to maintaining the post-2020 standards now in place, the 2018 proposal would increase U.S. fuel consumption by about half a million barrels per day (2–3 percent of total daily consumption, according to the Energy Information Administration) and would impact the global climate by 3/1000th of one degree Celsius by 2100 (EPA 2018). California and other states have stated their intent to challenge federal actions that would delay or eliminate GHG reduction measures and have committed to cooperating with other countries to implement global climate change initiatives. Thus, the timing and consequences of the 2018 federal proposal are speculative at this time.

In addition to standards for light-duty cars and trucks, EPA and the NHTSA have implemented Phase 1 of the Medium- and Heavy-Duty Vehicle GHG Emissions and Fuel Efficiency Standards, which apply to model years 2014–2018. Phase 2 of these standards would apply to model years 2021–2027 and would reduce GHG emissions by 1 billion MT over its lifetime (EPA 2015). In addition to GHG reduction and fuel efficiency, the standards are anticipated to generate development and research jobs focused on advanced cost-effective technologies for cleaner and more efficient commercial vehicles.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

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

Assembly Bill 1493

Assembly Bill (AB) 1493 required that ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty trucks and other vehicles determined by ARB to be vehicles whose primary use is noncommercial personal transportation in the state." These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. In June 2009, the EPA Administrator granted a CAA waiver of preemption to California, allowing the state to implement its own GHG emissions standards for motor vehicles beginning with model year 2009. California agencies worked with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger car model years 2017–2025. California's CAA waiver has been questioned by the current federal administration, which proposed to remove it as part of the proposed 2018 amendments described above.

Executive Order S-3-05

Executive Order S-3-05, issued in recognition of California's vulnerability to the effects of climate change, set forth the following reduction goals and 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

In 2006, California enacted the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Section 38500 et seq.). AB 32 further details and puts into law the midterm GHG reduction goal established in Executive Order S-3-05: reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies ARB as the state agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

In December 2008, ARB 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 (ARB 2008). The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of California's GHG inventory. ARB 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.

ARB is required to update the Scoping Plan at least once every 5 years to evaluate progress and develop future inventories that may guide this process. ARB approved the *First Update to the Climate Change Scoping Plan: Building on the Framework* (Scoping Plan Update) in June 2014 (ARB 2014). The Scoping Plan Update includes a status of the 2008 Scoping Plan measures and other federal, state, and local efforts to reduce GHG emissions in California, and potential actions to further reduce GHG emissions by 2020. The Scoping Plan Update determined that the state was on schedule to achieve the 2020 target (i.e., 1990 levels by 2020). However, it identified that an accelerated reduction in GHG emissions would be required to achieve the Executive Order S-3-05 2050 reduction target of 80 percent below 1990 levels by 2050.

The 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) (ARB 2017), which addresses the 2030 target of a 40 percent reduction in GHG emissions below 1990 statewide GHG emissions, pursuant to SB 32 (described below), was finalized in December 2017. The Second Update to the Scoping Plan 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 (ARB 2017).

Executive Order B-30-15

In April 2015, Governor Edmund G. Brown Jr. issued an executive order establishing a statewide GHG reduction goal of 40 percent below 1990 levels by 2030. The emission reduction target acts as an interim goal between the AB 32 target (i.e., achieve 1990 emission levels by 2020) and Governor Brown's Executive Order S-3-05 goal of reducing statewide emissions 80 percent below 1990 levels by 2050. In addition, the executive order aligns California's 2030 GHG reduction goal with the European Union's reduction target (i.e., 40 percent below 1990 levels by 2030) that was adopted in October 2014.

Senate Bill 32

Approval of SB 32 in September 2016 extends the provisions of AB 32 from 2020 to 2030, with a new target of 40 percent below 1990 levels by 2030. The companion bill, AB 197, adds two nonvoting members to ARB; creates the Joint Legislative Committee on Climate Change Policies consisting of at least three senators and three Assembly members; requires additional annual reporting of emissions; and requires Scoping Plan updates to include alternative compliance mechanisms for each statewide reduction measure, along with market-based compliance mechanisms and potential incentives.

Executive Order S-1-07

Executive Order S-1-07 acknowledges that the transportation sector is the main source of GHG emissions in California. The order established a goal of reducing the carbon intensity of fuels for mobile, stationary, and portable emissions sources sold in California by a minimum of 10 percent by 2020. It also directed ARB to

determine whether this Low Carbon Fuel Standard could be adopted as a discrete, early-action measure after meeting the mandates in AB 32. ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

Senate Bill 97

SB 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the California Governor's Office of Planning and Research to prepare, develop, and transmit to the CNRA guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The CNRA adopted those guidelines on December 30, 2009, and the guidelines became effective March 18, 2010.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and regional housing needs allocations. SB 375 requires metropolitan planning organizations (MPOs) to incorporate passenger vehicle GHG emissions reduction targets into the regional transportation planning process and adopt either a "sustainable communities strategy" or an "alternative planning strategy" that demonstrates how these reduction targets could be met.

ARB adopted regional GHG targets for passenger vehicles and light trucks for 2020 and 2035 for the 18 MPOs in California. *VROOM…Variety in Rural Options of Mobility: HCAOG 20-Year Regional Transportation Plan 2017 Update*, the regional transportation plan for Humboldt County, is prepared by the Humboldt County Association of Governments, which is not an MPO, and is not required to incorporate GHG emissions reductions targets. The VROOM document does, however, include goals related to reducing GHG emissions among its objectives and planning priorities (HCAOG 2017).

California Air Resources Board Advanced Clean Cars Program/Zero Emission Vehicle Program

AB 1493 (Chapter 200, Statutes of 2002), also known as the Pavley regulations, required ARB to adopt regulations by January 1, 2005, that would result in the achievement of the "maximum feasible" reduction in GHG emissions from vehicles used in the state primarily for noncommercial, personal transportation.

In January 2012, ARB approved a new emissions-control program for model years 2017–2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards called Advanced Clean Cars (Title 13, Sections 1962.1 and 1962.2 of the California Code of Regulations [13 CCR Sections 1962.1 and 1962.2]). The Advanced Clean Cars requirements include new GHG standards for model year 2017–2025 vehicles. ARB anticipates that the new standards will reduce motor vehicle GHG emissions by 34 percent in 2025 (ARB 2011).

The Advanced Clean Cars Program also includes the Low Emission Vehicle III amendments to the Low Emission Vehicle regulations (13 CCR Section 1900 et seq.), the Zero Emission Vehicle Program, and the Clean Fuels Outlet Regulation. The Zero Emission Vehicle Program is designed to achieve California's long-term emission reduction goals by requiring manufacturers to offer for sale specific numbers of the very cleanest cars available. These zero-emission vehicles, which include battery electric, fuel cell, and plug-in hybrid electric vehicles, have now entered the marketplace. They are expected to be fully commercial by 2020. The Clean Fuels Outlet regulation ensures that fuels such as electricity and hydrogen are available to meet the needs of the new advanced technology vehicles as they come to market.

Executive Order B-16-12

Executive Order B-16-12 orders state entities under the direction of the Governor including ARB, the California Energy Commission (CEC), and the California Public Utilities Commission (CPUC) to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles, including:

- infrastructure to support up to 1 million zero-emission vehicles by 2020;
- widespread use of zero-emission vehicles for public transportation and freight transport by 2020;
- more than 1.5 million zero-emission vehicles on California roads by 2025;
- annual displacement of at least 1.5 billion gallons of petroleum fuels by 2025; and
- a reduction of GHG emissions from the transportation sector equaling 80 percent below 1990 levels by 2050.

Executive Order S-01-07 (Low Carbon Fuel Standard)

Executive Order S-01-07 (17 CCR Section 95480 et seq.) requires the state to achieve a 10 percent or greater reduction by 2020 in the average fuel carbon intensity for transportation fuels in California regulated by ARB. ARB identified the Low Carbon Fuel Standard as a discrete early action item under AB 32, and the final ARB resolution (No. 09-31) adopting the standard was issued on April 23, 2009. ARB readopted the Low Carbon Fuel Standard in 2015.

Senate Bills 1078 and 107, Executive Orders S-14-08 and S-21-09, Senate Bill X1-2, Senate Bill 350, and Senate Bill 100 (California Renewables Portfolio Standards)

SB 1078 (Chapter 516, Statutes of 2002) required retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. Executive Order S-14-08 expanded the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. Executive Order S-21-09 directs ARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020. The 33 percent-by-2020 goal and requirements were codified in April 2011 with SB X1-2. This new Renewable Portfolio Standard applies to all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Requirements extending past 2020 have been established by SB 350 (2015), which increased the renewable source requirement to 50 percent by the end of 2030, and SB 100, which took effect on January 1, 2019, increasing the renewable source requirement to 60 percent by 2030 and requiring all the state's electricity to come from carbon-free resources by 2045 (CPUC 2019).

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was signed by Governor Arnold Schwarzenegger in September 2006. SB 1368 required CPUC to establish a GHG performance standard for baseload generation from investor-owned utilities by February 1, 2007. The CEC was required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not 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, be generated from plants that meet the standards set by CPUC and the CEC.

Executive Order B-55-18

EO B-55-18 (September 2018) establishes 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." This executive order directs ARB to "work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal."

Building Energy: Title 24

Title 24, Part 6. Title 24 of the California Code of Regulations was established in 1978 and serves to enhance and regulate California's building standards. Although not initially promulgated to reduce GHG emissions, Part 6 of Title 24 specifically establishes Building Energy Efficiency Standards that are designed to ensure new and existing buildings in California achieve energy efficiency and preserve outdoor and indoor environmental quality. The California Energy Commission is required by law to adopt standards every 3 years that are cost effective for homeowners over the 30-year lifespan of a building. These standards are updated to consider and incorporate new energy-efficient technologies and construction methods. As a result, these standards save energy, increase electricity supply reliability, increase indoor comfort, avoid the need to construct new power plants, and help preserve the environment. The 2016 Title 24 standards are the current applicable building energy efficiency standards, and became effective on January 1, 2017. The 2019 Standards will continue to improve upon the 2016 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2019 Standards will go into effect on January 1, 2020.

Title 24, Part 11. In addition to the California Energy Commission's efforts, in 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11 of Title 24) is commonly referred to as California Green Building Standards Code (CALGreen), and establishes minimum mandatory standards as well as voluntary standards pertaining to the planning and design of sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and interior air quality. The CALGreen standards took effect in January 2011 and instituted mandatory minimum environmental performance standards for all ground-up, new construction of commercial, low-rise residential, and state-owned buildings, schools, and hospitals. The CALGreen 2016 standards became effective on January 1, 2017. The CALGreen 2019 standards will continue to improve upon the 2016 CALGreen standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The CALGreen 2019 standards will go into effect on January 1, 2020.

Title 20 of the California Code of Regulations

CCR Title 20 requires manufacturers of appliances to meet state and federal standards for energy and water efficiency. Performance of appliances must be certified through the CEC to demonstrate compliance with standards. New appliances regulated under Title 20 include refrigerators, refrigerator-freezers, and freezers; room air conditioners and room air-conditioning heat pumps; central air conditioners; spot air conditioners; vented gas space heaters; gas pool heaters; plumbing fittings and plumbing fixtures; fluorescent lamp ballasts; lamps; emergency lighting; traffic signal modules; dishwashers; clothes washers and dryers; cooking products; electric motors; low-voltage dry-type distribution transformers; power supplies; televisions and consumer audio and video equipment; and battery charger systems. Title 20 presents protocols for testing for each type of appliance covered under the regulations, and appliances must meet the standards for energy performance, energy design, water performance, and water design. Title 20 contains three types of standards for appliances: federal and state

standards for federally regulated appliances, state standards for federally regulated appliances, and state standards for nonfederally regulated appliances.

Assembly Bill 1109

Enacted in 2007, AB 1109 required the CEC to adopt minimum energy efficiency standards for general-purpose lighting, to reduce electricity consumption 50 percent for indoor residential lighting and 25 percent for indoor commercial lighting.

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

North Coast Unified Air Quality Management District

The North Coast Unified Air Quality Management District (NCUAQMD) attains and maintains air quality conditions in Humboldt County through public education, enforcement of air quality regulations, and promotion of clean air programs. NCUAQMD administers a series of air pollution reduction programs including open burning permits, grants, permitting of stationary sources, emission inventory and air quality monitoring, and planning and rule development. NCUAQMD does not have any rules or regulations related to GHG emissions and global climate change.

Humboldt County Policies and Ordinances

The Air Quality Element and Energy Element of the *Humboldt County General Plan* (General Plan) contain the following goals, policies, and standards relevant to GHG emissions and the proposed project:

Goal AQ-G3: Greenhouse Gas Emissions. Successful mitigation of greenhouse gas emissions associated with this Plan to levels of non-significance as established by the Global Warming Solutions Act and subsequent implementation of legislation and regulations.

- **Policy AQ-P9: County Climate Action Plan.** Encourage the use of renewable energy and environmentally preferable distributed energy generation systems in the county.

- **Policy AQ-P11: Review of Projects for Greenhouse Gas Emission Reductions.** The County shall evaluate the GHG emissions of new large scale residential, commercial and industrial projects for compliance with state regulations and require feasible mitigation measures to minimize GHG emissions.

- **Policy AQ-P17: Preservation and Replacement of On-Site Trees.** Projects requiring discretionary review should preserve large trees, where possible, and mitigate for carbon storage losses attributable to significant removal of trees.

    - **Standard AQ-S2: Evaluate Greenhouse Gas Emission Impacts.** During environmental review of large scale residential, commercial and industrial projects, include an assessment of the project's GHG emissions and require feasible mitigation consistent with best practices documented by the California Air Pollution Control Officers Association in their 2008 white paper "CEQA & Climate Change" or successor documents.

    - **Standard AQ-S6: Preservation and Replacement of On-site Trees.** Large scale residential, commercial and industrial projects which remove a significant number of large trees (for example, more

than 50 trees of greater than 12 inches DBH) shall plant replacement trees on-site or provide offsetting carbon mitigations.

Goal E-G3: Supply of Energy from Local Renewable Sources. Increased local energy supply from a distributed and diverse array of renewable energy sources and providers available for local purchase and export.

- **Policy E-P3: Local Renewable Energy Supply.** The County shall support renewable energy development projects including biomass, wind, solar, "run of the river" hydro-electric, and ocean energy, consistent with this Plan that increases local energy supply.

- **Policy E-P13: Incentives for Using Alternative Energy.** Encourage the use of renewable energy and environmentally preferable distributed energy generation systems in the county.

- **Policy E-P15. Land Use Planning and Compatibility.** Coordinate with local agencies, communities, and landowners to assess potential wind and offshore renewable energy development. Such an assessment shall consider site suitability, energy potential, and potential impacts to biological and cultural resources.

3.8.3 Environmental Impacts and Mitigation Measures

Thresholds of Significance

The following thresholds of significance are based on the environmental checklist in Appendix G of the State CEQA Guidelines, as amended. Implementing the proposed project would result in a significant impact related to GHG emissions if it would:

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

- conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

NCUAQMD has not yet identified recommended GHG significance thresholds for the evaluation of development projects subject to CEQA review. However, on July 9, 2015, NCUAQMD adopted Rule 111 for the evaluation of stationary sources subject to New Source Review and federal Title V permitting requirements. In accordance with this rule, stationary sources that emit less than 25,000 tons per year of CO_2e are exempt from determining compliance. This threshold is intended for determining compliance with federal Title V stationary-source permitting requirements and is typically not recommended for the evaluation of GHG emissions for stationary-source projects subject to CEQA review.

However, various other air districts in the state have identified recommended GHG significance thresholds for stationary sources, including the Sacramento Metropolitan Air Quality Management District (SMAQMD), San Luis Obispo County Air Pollution Control District, Bay Area Air Quality Management District (BAAQMD), and South Coast Air Quality Management District (SCAQMD).

To establish additional context for considering the order of magnitude of the project's GHG emissions, and without a NCUAQMD-recommended GHG threshold of significance, this analysis takes into account the GHG reduction targets established by the state under AB 32 and related legislation, following considerations by other

government agencies and associations about the levels of GHG emissions that constitute a substantial contribution to climate change:

- Facilities (i.e., stationary, continuous sources of GHG emissions) that generate more than 25,000 MT CO_2e per year are mandated to report their GHG emissions to ARB pursuant to AB 32.
- Stationary sources that generate more than 10,000 MT CO_2 per year may be required to participate in the cap-and-trade program through the Western Climate Initiative (ARB 2018).
- SCAQMD's GHG Working Group has proposed a significance screening level of 3,000 MT CO_2 per year for residential and commercial projects (SCAQMD 2015).
- BAAQMD has adopted an project-level, operational threshold of significance that requires compliance with a qualified GHG reduction strategy or similar plan, maximum annual emissions of 1,100 MT CO_2e per year or less, or achievement of a GHG efficiency rate of no more than 4.6 MT CO_2e per service population per year (BAAQMD 2017). BAAQMD has not adopted a project-level threshold of significance for construction-related GHG emissions.
- SMAQMD has adopted construction and operational GHG thresholds of 1,100 MT CO_2e per year for land development and construction projects (SMAQMD 2015).

At the time of this writing, no federal, state, or local air quality regulatory agency has an adopted a quantitative threshold of significance for construction-related GHG emissions. This information is presented for informational purposes only, and it is not the intention of the lead agency to adopt any of the above-listed emission levels as a numeric threshold. Rather, the intention is to put project-generated GHG emissions in the appropriate statewide context to evaluate whether the project's contribution to the global impact of climate change would be substantial.

Therefore, in the absence of quantitative thresholds of significance from NCUAQMD, construction-related and operational emissions are evaluated relative to the state GHG mandates and to whether the project would impede or assist in the state's efforts. Consistent with General Plan Standard AQ-S2, the analysis uses a net zero threshold, which is one of many thresholds recommended by the California Air Pollution Control Officers Association's 2008 white paper "CEQA & Climate Change" and by ARB's 2017 Scoping Plan. Specifically, ARB's 2017 Scoping Plan states, "[a]chieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development."

For reference and informational purposes, project emissions are also compared to SMAQMD's and BAAQMD's GHG threshold of 1,100 MT CO_2e per year for land use development projects. Direct comparison of construction GHG emissions with long-term thresholds would not be appropriate because these emissions cease upon completion of construction. Other districts (e.g., SCAQMD, 2008; San Luis Obispo County Air Pollution Control District, 2012) recommend amortizing GHG emissions from a project's construction activities over the project's operational lifetime—typically assumed to be 25 years for wind turbine generators (WTGs) (EIA 2017)—to allow a comparison with the significance thresholds for long-term GHG emissions. For comparison to the significance threshold, construction emissions were amortized over the lifetime of the project and added to the annual operational emissions. However, the determination of significance is ultimately based on evaluation of the project's long-term contribution to or conflict with state GHG reduction goals.

To address the second criterion for GHG impact analysis listed in Appendix G of the State CEQA Guidelines, the following analysis considers that if the proposed project would contribute to the state's and the County's GHG emissions reduction goals, then the project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

ANALYSIS METHODOLOGY

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 context of the potential contribution to the cumulatively significant impact of global climate change. The geographic area for this cumulative impact analysis is global.

Short-term construction activities and long-term operations for the proposed project would emit GHGs. These GHG emissions were modeled using the same methods and assumptions as those described in Section 3.4, "Air Quality," of this EIR. To estimate GHG emissions, the analysis used California Emissions Estimator Model (CalEEMod) Version 2016.3.2; the Road Construction Emissions Estimator; and calculations that incorporated EMFAC on-road emissions factors, the Swiss Confederation Federal Office of Civil Aviation's helicopter emission factors, and EPA AP-42 emissions factors and methodology. The methodology to estimate the criteria air pollutant and precursor emissions described in Section 3.4, "Air Quality," is also applicable to the GHG emissions estimates. Appendix B provides the detailed modeling inputs, assumptions, and outputs.

IMPACTS AND MITIGATION MEASURES

IMPACT 3.8-1	Generation of Greenhouse Gas Emissions. *Implementing the proposed project would generate construction-related and operational GHG emissions. Long-term operation of the proposed project would reduce CO_2e emissions compared to existing conditions. Therefore, this impact would result in a* ***less than cumulatively considerable contribution to the significant cumulative impact of global climate change.***

GHGs would be emitted during construction and operational activities for the proposed project. During construction, off-road equipment (including diesel generators), materials transport, and worker commutes would generate GHG emissions. Construction-related GHG emissions would be generated primarily by exhaust from off-road construction equipment, heavy-duty material haul trucks, and construction worker commutes. Depending on the activities occurring on a given day, construction-related GHG emissions would vary substantially. For example, during installation of the WTGs, heavy-duty construction equipment would be used to lift turbine parts. On these days, heavy-duty construction equipment, haul trucks, and construction worker vehicles would emit GHGs in their exhaust. Conversely, on some days, construction activities would be less intense, or only construction worker trips would occur. The emissions discussed in this section represent the worst-case scenario for the proposed project or project alternatives; and the total worst-case, construction-related GHG emissions were used to evaluate the significance of the proposed project's construction emissions on the cumulative impact of global climate change.

GHG emissions persist in the atmosphere for extended periods of time, but construction-related emissions would be generated only during the 18-month construction period. Therefore, construction emissions were amortized over the life of the project (estimated to be 25 years) and compared to the operational thresholds to determine the significance of the project. The maximum construction emissions over the lifetime of the proposed project would be approximately 3,920 MT CO_2e, which translates into annual construction emissions of approximately 156.8 MT CO_2e per year when amortized over 25 years, the estimated lifetime of WTGs (EIA 2017).

After construction and installation of the WTGs, the proposed project would generate GHG emissions during operations and maintenance (O&M) activities. Sources of operational GHG emissions would include energy consumption (electricity and natural gas), transportation, and off-road, stationary, waste, and water sources. Operational GHG emissions are distinguished by direct and indirect GHG emissions. Direct GHG emissions are those emissions generated at the location of consumption or use. For example, mobile-source emissions are direct emissions because GHG emissions are generated as a vehicle begins to move. Indirect emissions are those emissions that occur at a different time or location from the point of consumption or use. For example, electricity-related GHG emissions are indirect: Although consumers use electricity at home, the fuel combustion and emissions associated with creating that electricity likely occurred off-site or at a different time.

Operation of the WTGs would require a negligible increase in vehicular trips (an estimated maximum of three round trips per day), for staffing and maintenance activities at the O&M facility and maintenance at the WTG sites, as compared to existing conditions. Operation of the O&M building would require electricity for power and lighting. Off-road sources would include equipment that would be used intermittently for maintenance, such as a crane, forklift, and truck. A stationary source would be the potential use of an emergency generator, as needed. The O&M building would also consume natural gas for space and water heating for the proposed employees. Natural gas consumption and related GHG emissions were estimated using default assumptions contained in CalEEMod.

Table 3.8-1 presents construction-related and operational GHG emissions. Construction-related emissions are presented as total GHG emissions anticipated over the entire 18-month construction period. Operational emissions are presented as maximum annual emissions. As described above under “Thresholds of Significance,” GHG emissions from construction activities have been amortized over the proposed project’s operational lifetime (assumed to be 25 years [EIA 2017]) and added to the maximum annual operational emissions to present total annual GHG emissions over the lifetime of the project. As described under “Analysis Methodology” above, the project’s GHG emissions are compared with BAAQMD’s significance threshold for long-term annual GHG emissions, 1,100 MT CO_2e per year, as a point of reference regarding the magnitude of project-generated emissions.

As shown in Table 3.8-1, total construction emissions would be 3,920 MT CO_2e. When amortized over 25 years, annual GHG emissions attributable to construction would be 156.8 MT CO_2e/year. Total annual operational emissions are estimated to be 89.4 MT CO_2e/year. Amortized construction emissions can be added to annual operational emissions to estimate the total annual GHG emissions attributable to implementation of the proposed project; these total emissions are estimated to be 246 MT CO_2e/year.

Table 3.8-1. Modeled Greenhouse Gas Emissions for Construction and Operations of the Proposed Project

Emissions Source	GHG Emissions (MT CO_2e/year)
Construction GHG Emissions	
Maximum Annual Construction Emissions	2,400
Total Construction Emissions (over the entire 18-month construction period)	3,920
Amortized Construction Emissions [a]	156.8
Area	0.0
Energy	8.6
Mobile	4.1
Off-road	21.0
Stationary	47.8
Waste	3.7
Water	4.1
Total Annual Operational Emissions [b]	**89.4**
Total Annual Operational Emissions + Amortized Construction Emissions [b]	**246**
BAAQMD Long-Term Annual GHG Emissions Threshold	**1,100**

Notes:
BAAQMD = Bay Area Air Quality Management District; CO_2e = carbon dioxide equivalent; GHG = greenhouse gas; MT = metric tons
[a] Amortized over 25 years, the assumed lifetime of the wind turbine generators.
[b] Totals may not add due to rounding.
Source: Modeled by AECOM in 2019. See Appendix B for detailed modeling files.

Net Zero Threshold

The project would result in emissions of 246 MT CO_2e per year (annual operational GHG emissions plus amortized construction GHG emissions). The proposed project's generating capacity would be 155 megawatts (MW). On an annual basis, this would generate 407,340 megawatt-hours (MWh) (1,389,844 million British thermal units) per year. The latest published GHG emissions factor estimate for Pacific Gas and Electric Company's (PG&E's) energy production (2016) is 0.133 MT CO_2e per MWh (PG&E 2018). PG&E reported that 80 percent of its power mix was GHG-free in 2019, with 33 percent of its total mix coming from renewable sources (PG&E 2019). The project would provide a reduction of 173,700 MT CO_2 per year, assuming use of the renewable electricity generated by the project instead of electricity generated by fossil-fuel sources. Considering that the project's annual GHG emissions would be approximately 246 MT CO_2e per year, the net reduction in GHG emissions would be approximately 173,454 MT CO_2e per year and 4,336,335 MT CO_2e over the 25-year project life.

In light of SB 100, it is reasonable to assume that the project's energy would be used to replace fossil fuel–generated energy, at least in the long term. Even assuming that there would not be a one-to-one replacement of fossil-fuel energy with the project's wind energy, the project would provide more clean energy than the GHG emissions it produces. Accordingly, the project would meet a net zero threshold and would make a **less than cumulatively considerable contribution to the significant cumulative impact of global climate change.**

The expansion of the Bridgeville Substation would make a **less than cumulatively considerable contribution to the significant cumulative impact of global climate change**.

IMPACT 3.8-2	Consistency with Applicable Plans, Policies, and Regulations Adopted for the Purpose of Reducing the Emissions of GHGs. *Implementing the proposed project would be consistent with state and County policies adopted to reduce GHGs. Therefore, this impact would result in a less than cumulatively considerable contribution to the significant cumulative impact of global climate change.*

Consistency with State Policies

The project would provide a potential reduction in GHG emissions each year of operation if the electricity generated by the project's wind 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 2(1X) requires all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators, to achieve Renewable Portfolio Standards of 33 percent renewable energy by 2020. Requirements extending past 2020 have been established by SB 350 (2015), which increased the renewable-source requirement to 50 percent by the end of 2030; and by SB 100, which took effect on January 1, 2019, increasing the renewable-source requirement to 60 percent by 2030 and requiring that all of the state's electricity come from carbon-free resources by 2045 (CPUC 2019). The project would provide a source of renewable energy to achieve the Renewable Portfolio Standards' target of 60 percent by 2030 set by SB 100 and help the state reach its goal to be carbon neutral by 2045.

Consistency with the General Plan Policies Adopted to Reduce Greenhouse Gas Emissions

The Air Quality and Energy Elements of the *Humboldt County General Plan* include the following goals, policies, standards, and implementation measures that relate to decreasing the generation of GHG emissions with which the proposed project would be consistent:

- **Policy AQ-P9: County Climate Action Plan**. Encourage the use of renewable energy and environmentally preferable distributed energy generation systems in the county.
  - *Consistent*. The project would add a new renewable energy source in the county, supporting this policy.
- **Policy AQ-P11: Review of Projects for Greenhouse Gas Emission Reductions.** The County shall evaluate the GHG emissions of new large scale residential, commercial and industrial projects for compliance with state regulations and require feasible mitigation measures to minimize GHG emissions.
  - *Consistent*. This EIR chapter fulfills the requirement to evaluate the project's GHG emissions.
- **Policy AQ-P17: Preservation and Replacement of On-site Trees**. Projects requiring discretionary review should preserve large trees, where possible, and mitigate for carbon storage losses attributable to significant removal of trees.
  - **Standard AQ-S6: Preservation and Replacement of On-site Trees.** Large scale residential, commercial and industrial projects which remove a significant number of large trees (for example, more than 50 trees of greater than 12 inches DBH [diameter at breast height]) shall plant replacement trees on-site or provide offsetting carbon mitigations.

- *Consistent*. The trees to be removed are on actively managed timberlands and are slated to be removed. Trees would be replaced in accordance with standard timber harvesting practices.

- **Standard AQ-S2: Evaluate Greenhouse Gas Emission Impacts.** During environmental review of large scale residential, commercial and industrial projects, include an assessment of the project's GHG emissions and require feasible mitigation consistent with best practices documented by the California Air Pollution Control Officers Association in their 2008 white paper "CEQA & Climate Change" or successor documents.

  - *Consistent*. One threshold recommended by the California Air Pollution Control Officers Association is net zero. This threshold is also suggested by ARB in its 2017 Scoping Plan. This document includes a net zero analysis above. The project would produce more carbon-free energy than it would produce GHG emissions.

Goal E-G1: Countywide Strategic Energy Planning. An effective energy strategy based on self-sufficiency, development of renewable energy resources and energy conservation that is actively implemented countywide through Climate Action Plans, General Plans and the Redwood Coast Energy Authority's Comprehensive Energy Action Plan.

- *Consistent*. The project would provide a renewable energy resource in the county, which supports this goal.

Goal E-G3: Supply of Energy from Local Renewable Sources. Increased local energy supply from a distributed and diverse array of renewable energy sources and providers available for local purchase and export.

- *Consistent*. The project would increase the energy produced in the county from renewable resources.

- **Policy E-P3: Local Renewable Energy Supply.** The County shall support renewable energy development projects including biomass, wind, solar, "run of the river" hydroelectric, and ocean energy, consistent with this Plan that increases local energy supply.

  - *Consistent*. The project is a renewable energy project that would increase the local supply of energy generated by renewable resources.

- **Implementation Measure E-IM2: Comprehensive Action Plan for Energy.** Support efforts to implement the Redwood Coast Energy Authority (RCEA) Comprehensive Action Plan for Energy.

  - *Consistent*. The RCEA Comprehensive Action Plan for Energy encourages development of wind power facilities as one way to reduce emissions from the energy sector. The project would create a new wind-power facility in the county.

- **Implementation Measure E-IM5: Wind Energy Development.** Develop wind-permitting guidelines for residential and small commercial-scale wind energy systems. Adopt and modify, as appropriate, the guidelines established in California State Law AB 1207. Educate the public about the benefits of small-scale wind energy systems.

- *Consistent*. Based on the ability to develop in the county, the project is proposing a wind energy facility, which is the result desired by this implementation measure.

Implementing the proposed project would not prohibit or conflict with achievement of County measures designed to reduce GHG emissions. In particular, the project would be in alignment with Goal E-G3, Policy E-P3, and Implementation Measure E-IM5, all of which encourage local renewable energy supplies, including wind energy systems.

Conclusion

The proposed project would ultimately generate electricity from a source that would result in minimal GHG emissions from production. GHG emissions associated with each unit (i.e., kilowatt-hour [kWh]) of electricity produced vary depending on the sources used by a utility provider to produce its electricity. For example, a utility that uses renewable resources (e.g., solar, wind, hydroelectric) to produce its electricity will generate less GHG emissions per kWh of electricity produced than a utility that uses coal, natural gas, or other fossil fuels. WTGs use the energy in the motion of the wind to make mechanical energy, which is then converted to electrical energy. Generation of electricity by wind energy would generate a smaller amount of GHGs per kWh of electricity produced than electricity generated by fossil-fuel sources. By increasing the availability of renewable energy sources for electricity, overall GHG emissions rates associated with electricity production would decrease.

As described in California's 2017 *Climate Change Scoping Plan* (ARB 2017), emissions from the electricity sector are approximately 20 percent below 1990 levels, largely because of increased reliance on renewable generation and reduced coal generation of electricity throughout the state. As of June 2017, the renewable energy capacity from solar, wind, geothermal, small hydropower, and biomass power plants was 27,500 MW. The proposed project would add an additional 155 MW. Although this would be an increase of only about one-half of 1 percent, it is incremental contributions from these projects that have enabled California's increase in reliance on renewable energy and ultimate reduction in GHG emissions from this sector.

The proposed project would not necessarily immediately replace electricity generated by fossil-fuel plants at the same quantity, and the project would generate a small amount of GHG emissions. However, a substantially smaller amount of GHGs would be emitted for energy generation using wind power than using fossil fuels. Further, the proposed project would increase the availability of renewable energy sources as utilities in the state work toward meeting the requirements of SB 2(1X), SB 350, and SB 100.

Because the proposed project would contribute to the state's goals of GHG reductions from the electricity sector and would not conflict with measures identified in the *Humboldt County General Plan* for the purpose of reducing regional GHG emissions, the project would result in a **less than cumulatively considerable contribution to the significant cumulative impact of global climate change.**

The expansion of the Bridgeville Substation would make a **less than cumulatively considerable contribution to the significant cumulative impact of global climate change**.

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