

9.0 Greenhouse Gases

This section includes summary discussions of climate change science, existing setting conditions, applicable climate change policy and regulatory direction, projected project GHG emissions, GHG impacts, and mitigation measures to reduce impacts.

The information within this section is largely sourced from:

- *McKinleyville Town Center Q-Zone* (Humboldt County 2024);
- *2022 CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans* (Bay Area Air Quality Management District 2022); and
- *Humboldt County General Plan* (Humboldt County 2017).

Responses to the Notice of Preparation

There were no comments on the NOP regarding the scope of analysis for GHG emissions.

9.1 Environmental Setting

This section provides a general overview of climate change science and climate change issues.

Climate Change Science

The international scientific community has concluded with a high degree of confidence that human activities are causing an accelerated warming of the atmosphere. The resulting change in climate has serious global implications and consequently, human activities that contribute to climate change may have a potentially significant effect on the environment. In recent years, concern about climate change and its potential impacts has risen dramatically. That concern has translated into a range of international treaties and national and regional agreements aimed at diminishing the rate at which global warming is occurring. Over time, the federal government has been tackling concerns about climate change to varying degrees through a range of initiatives and regulatory actions. Many states and local agencies, private sector interests, and other public and private interests have also taken initiative to combat climate change. California has taken a leadership role in tackling climate change, as evidenced by the programs outlined in the Regulatory Setting section below.

Effects of Climate Change

Rising Temperatures

The Intergovernmental Panel on Climate Change, which includes more than 1,300 scientists from the United States and other countries, estimated that over the last century, global temperatures have increased by about 3.6 degrees Fahrenheit (°F) (NASA 2021). The Intergovernmental Panel on Climate Change forecasts indicate that global temperatures can be expected to continue to rise between 2.5 and 10°F over the next century.

The information below summarizes general effects of climate change, but also includes McKinleyville-specific projections of change based on the Cal-Adapt model where applicable. Cal-Adapt is a climate change projection modeling tool developed by California Energy Commission, includes information on environmental change projections resulting from global warming.

The model indicates that temperatures in the Humboldt County area have historically (1961-1990) averaged about 61°F. Under a medium GHG emissions projection scenario, temperatures are projected to rise to an average of 66°F by 2099 (Cal-Adapt 2024). Humboldt County has historically experienced an average of four extreme heat days per year (1961-1990). The model projections fluctuate on an annual basis. Under a medium GHG emissions scenario, the number of extreme heat days per year is expected to increase to an average of 15 by 2099.

Reduced Snowpack

Mountain snowpack acts as a large natural reservoir that stores water during the winter and releases it into rivers and reservoirs in the spring and summer. It is expected that there will be less snowfall and that the elevations at which snow falls will rise. Similarly, there will be less snowpack water storage to supply runoff water in the warmer months. It has already been documented that California's snow line is rising. More precipitation is expected to fall as rain instead of snow, and the snow that does fall will melt earlier, reducing mountain spring snowpack.

Water Supply

Climate change is expected to increase pressure on and competition for water resources, further exacerbating already stretched water supplies. Decreasing snowpack and spring stream flows and increasing demand for water from a growing population and hotter climate could lead to increasing water shortages in some locations in California. Water supplies are also at risk from rising sea levels. Competition for water between cities, farmers, and the environment is expected to increase.

Anticipated changes to source water conditions including more intense storm events, longer drought periods, reduced snowpack at lower elevations, and earlier spring runoff will likely impact the quality of the source waters in many locations in California.

Precipitation Levels

Precipitation levels are difficult to predict compared to other indicators of climate change. Annual rain and snowfall patterns vary widely from year to year, especially in California. Generally, higher temperatures increase evaporation and decrease snowfall, resulting in a drier climate. On average, Cal-Adapt projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. One of the four climate models projects slightly wetter winters, while a second projects slightly drier winters with a 10 to 20 percent decrease in total annual precipitation. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized.

Humboldt County has historically averaged about 51.5 inches of rainfall per year (1961-1990). Under a medium GHG emissions scenario, that number is forecast to decrease to about 51.4 inches by the end of the century (Cal-Adapt 2024).

More Frequent and Extreme Storm Events

Extreme weather is expected to become more common throughout California as a result of climate change. More extreme storm events are expected to increase water runoff to streams and rivers during the winter months, heightening flood risks. For example, warmer ocean surface temperatures have caused warmer and wetter conditions in the Sierra Nevada, increasing flood risk. Strong winter storms may produce atmospheric rivers that transport large amounts of water vapor from the Pacific Ocean to the California coast. As storm strength increases, the risk of flooding increases.

Sea Level Rise

Sea level rise is one of the most significant effects of climate change. Sea level has been rising over the past century, and the rate has increased in recent decades. Global average sea level has risen 8–9 inches (21–24 centimeters) since 1880. In 2022, global average sea level set a new record high - 101.2 mm (4 inches) above 1993 levels (National Oceanic and Atmospheric Administration 2022). Globally, sea levels are rising due to two main reasons: thermal expansion of warming ocean water and melting of ice from glaciers and ice sheets. Rising sea levels amplify the threat and magnitude of storm surges in coastal areas. Water infrastructure, often located along the coast or tidally-influenced water bodies, can be vulnerable to greater changes in storm surge intensity. The threat of flooding and damage to water infrastructure will

continue to increase over time as sea levels rise and the magnitude of storms increase. Rising sea levels will create stress on coastal ecosystems that provide recreation, protection from storms, and habitat for fish and wildlife, including commercially valuable fisheries. Rising sea levels can also introduce new, or exacerbate existing, saltwater intrusion into freshwater resources.

Diminished Air Quality

Climate change is expected to exacerbate air quality problems by increasing the frequency, duration, and intensity of conditions conducive to air pollution formation. Higher temperatures and increased ultraviolet radiation from climate change are expected to facilitate the chemical formation of more secondary air pollutants from ground-level sources. Conversely, decreased precipitation is expected to reduce the number of particulates cleansed from the air. Incidents of wildfires are expected to increase due to climate change, further contributing to air quality problems.

According to the American Lung Association's 2023 State of the Air report, nearly 36 percent of Americans, 119.6 million people still live in places with failing grades for unhealthy levels of ozone or particle pollution. The report found that California cities dominate the rankings of the nation's most widespread air pollutants, ozone and particle pollution (American Lung Association 2023).

Ecosystem Changes

Climate change effects will have broad impacts on local and regional ecosystems, habitats, and wildlife as average temperatures increase, precipitation patterns change, and more extreme weather events occur. Species that cannot rapidly adapt are at risk of extinction. As temperatures increase, California vegetation is expected to change. Desert and grassland vegetation is projected to increase while forest vegetation is projected to generally decline. The natural cycle of plant flowering and pollination, as well as the temperature conditions necessary for a thriving locally adapted agriculture, may also be affected. Perennial crops, such as grapes, may take years to recover. Increased temperatures also provide a foothold for invasive species of weeds, insects, and animals.

Social Vulnerability to Climate Change

The impacts of climate change will not affect people equally. People exposed to the most severe climate-related hazards are often those least able to cope with the associated impacts, due to their limited resources and adaptive capacity. Climate change is expected to have a greater impact on larger populations living in poorer and developing countries with lower incomes that rely on natural resources and agricultural systems that will likely be affected by changing climates.

Certain groups in developed countries like the United States will also experience more impacts from climate change than others. People in rural areas are more likely to be affected by climate change related droughts or severe storms compared to their urban counterparts. However, certain groups living in cities will also be at higher risk than others. Place of residence is another vulnerability indicator, as renters, households without air conditioning, households lacking access to grocery stores, households in treeless areas, and households on impervious land cover are also more vulnerable to climate change impacts.

Those at greatest risk include children, the elderly, those with existing health problems, the socially and/or economically disadvantaged, those who are less mobile, and those who work outdoors. Place of residence is another vulnerability indicator, as renters, households without air conditioning, households lacking access to grocery stores, households in treeless areas, and households on impervious land cover are also more vulnerable to climate change impacts.

Health Effects/Illness

As temperatures rise from global warming, the frequency and severity of heat waves will grow and increase the potential for bad air days, which can lead to increases in illness and death due to dehydration, heart attack, stroke, and respiratory disease. Additionally, dry conditions can lead to a greater number of wildfires producing smoke that puts people with asthma and respiratory conditions at risk of illness or death.

Higher temperatures and the increased frequency of heat waves are expected to significantly increase heat-related illnesses, such as heat exhaustion and heat stroke, while also exacerbating conditions associated with cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. An increase of 10°F in average daily temperature is associated with a 2.3 percent increase in mortality. During heat waves, mortality rates can increase to about nine percent. As temperatures increase, vulnerable populations such as children, the elderly, people with existing illnesses, and people who work outdoors will face the greatest risk of heat-related illness.

As climate change affects the temperature, humidity, and rainfall levels across California, some areas could become more suitable habitats for insects (especially mosquitoes), ticks, and mites that may carry diseases. Wetter regions are typically more susceptible to vector-borne diseases, especially human hantavirus cardiopulmonary syndrome, Lyme disease, and West Nile virus.

Greenhouse Gas Types

GHGs are emitted by natural processes and human activities. The human-produced GHGs most responsible for global warming and their relative contribution to it are carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons. The contribution of these GHGs to global warming based on the U.S. inventory of GHGs in 2019 (United States Environmental Protection Agency 2021) is summarized in [Table 9-1, GHG Types and Their Contribution to Global Warming](#).

Table 9-1 GHG Types and Their Contribution to Global Warming

Greenhouse Gas	Percent of all GHG	Typical Sources
Carbon dioxide	81.6 percent	Combustion of fuels, solid waste, wood
Methane (CH ₄)	10.2 percent	Fuel production/combustion; livestock, decay of organic materials
Nitrous Oxide (N ₂ O)	5.6 percent	Combustion of fuels, solid waste, agricultural/industrial processes
Chlorofluorocarbons (CFCs)	2.6 percent	Industrial processes

SOURCE: United States Environmental Protection Agency 2021

NOTE: Percentages reflect weighting for global warming potential

Greenhouse Gas Global Warming Potentials

Each type of GHG has a different capacity to trap heat in the atmosphere and each type remains in the atmosphere for a particular length of time. The ability of a GHG to trap heat is measured by an index called the global warming potential expressed as carbon dioxide equivalent. Carbon dioxide is considered the baseline GHG in this index and has a global warming potential of one.

The GHG volume produced by a particular source is often expressed in terms of carbon dioxide equivalent (CO₂e). Carbon dioxide equivalent describes how much global warming a given type of GHG will cause, with the global warming potential of CO₂ as the base reference. Carbon dioxide equivalent is useful because it allows comparisons of the impact from many different GHGs, such as methane, perfluorocarbons, or nitrous oxide. If a project is a source of several types of GHGs, their individual global warming potential can be standardized and expressed in terms of CO₂e. [Table 9-2, GHG Global Warming Potentials](#), presents the global warming potential of various GHGs.

Methane has a global warming potential of 21 times that of CO₂, and nitrous oxide has a global warming potential of 310 times that of CO₂. The families of chlorofluorocarbons, hydrofluorocarbons, and perfluorocarbons have a substantially greater global warming potential than other GHGs, ranging from approximately 1,300 to over 10,000 times that of CO₂. While CO₂ represents the vast majority of the total volume of GHGs in the atmosphere, release of even small quantities of other types of GHGs can be significant for their contribution to climate change.

Table 9-2 GHG Global Warming Potentials

GHG	Atmospheric Lifetime (Years)	Global Warming Potential (100-Year Time Horizon)
Carbon Dioxide CO ₂	50-200	1
Methane CH ₄	12 (+/- 3)	21
Nitrous Oxide N ₂ O	120	310
HFC-23	264	11,700
HFC-134a	14.6	1,300
HFC-152a	1.5	140
PFC Tetrafluoromethane CF ₄	50,000	6,500
PFC Hexafluoroethane C ₂ F ₆	10,000	9,200
Sulfur Hexafluoride SF ₆	3,200	23,900

SOURCE: United Nations Framework Convention on Climate Change 2020

Greenhouse Gas Inventories

California GHG Emissions Inventory

California is a substantial contributor of global greenhouse gases. Based on the California Air Resources Board’s most recent state GHG inventory, a net of 418.2 million metric tons of CO₂e were generated in 2019 (California Air Resources Board 2022). In 2019, 41.0 percent of all GHG gases emitted in the state came from the transportation sector. Industrial uses and electric power generation (in state generation and out of state generation for imported electricity) were the second and third largest categories at 24.0 percent and 14.0 percent, respectively. The commercial and residential use sectors combined to generate about 14.0 percent of the 2019 emissions, while the agricultural sector contributed 7.0 percent.

County of Humboldt GHG Emissions Inventory

The County is currently in the process of preparing an updated draft to the Humboldt Regional Climate Action Plan, which includes revised values for the community GHG emissions inventory as part of the process. The 2022 communitywide emissions were estimated at 1,531,167 metric tons (“MT”) of CO₂e (Rincon Consultants 2024). As with most counties in the state, the primary source of GHG emissions is associated with on-road and off-road transportation (cars and trucks). These sources accounted for about 81 percent of all emissions, with approximately 14 percent created by electricity and natural gas use, 3 percent from solid waste and wastewater, and 2 percent from other sources. Communitywide GHG emissions are expected to decrease by approximately 10 percent between the baseline year of 2022 and 2045.

9.2 Regulatory Setting

State, regional, and local policies and regulations pertaining to climate change are summarized below. The Federal government has also adopted policies and regulations to address climate change. However, because California has been at the forefront of addressing climate change, its suite of policies and regulations is generally more comprehensive and stringent than is the Federal government's. Therefore, this regulatory setting section focuses on California's climate change regulatory framework. This framework provides context for how climate change is being addressed and identifies policy and regulatory actions whose implementation would lessen the contribution of the proposed project to climate change.

State

Overall Statutory Framework

The California Legislature has enacted a series of statutes addressing the need to reduce GHG emissions across the State. These statutes can be categorized into four broad categories: (i) statutes setting numerical statewide targets for GHG reductions, and authorizing California Air Resources Board to enact regulations to achieve such targets; (ii) statutes setting separate targets for increasing the use of renewable energy for the generation of electricity throughout the state; (iii) statutes addressing the carbon intensity of vehicle fuels, which prompted the adoption of regulations by California Air Resources Board; and (iv) statutes intended to facilitate land use planning consistent with statewide climate objectives. The discussion below will address each of these key sets of statutes, as well as California Air Resources Board "Scoping Plans" intended to achieve GHG reductions under the first set of statutes and recent building code requirements intended to reduce energy consumption.

Statutes Setting Statewide GHG Reduction Targets

Assembly Bill 32 (Global Warming Solutions Act)

In September 2006, the California State Legislature enacted the California Global Warming Solutions Act of 2006, also known as Assembly Bill (AB) 32. AB 32 established regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 required that statewide GHG emissions be reduced to 1990 levels by 2020 through an enforceable statewide cap on emissions that phased in starting in 2012.

Senate Bill 32

Effective January 1, 2017, Senate Bill (SB) 32 added a new section to the Health and Safety Code. It provided that statewide GHG be reduced to at least 40 percent below the statewide greenhouse gas emissions limit no later than December 31, 2030.

Between AB 32 (2006) and SB 32 (2016), the Legislature codified some of the GHG reduction targets included within certain high-profile Executive Orders issued by the last two governors. The 2020 statewide GHG reduction target in AB 32 was consistent with the second of three statewide emissions reduction targets set forth in former Governor Arnold Schwarzenegger’s 2005 Executive Order known as S-3-05. That Executive Branch document included the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels. To meet the targets, the Governor directed several state agencies to cooperate in the development of a climate action plan. In 2015, former Governor Brown issued another Executive Order, B-30-15, which created a “new interim statewide greenhouse gas emission reduction target to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050.” SB 32 codified this target.

Senate Bill 350

The Legislature has not yet set a 2050 target in the manner done for 2020 and 2030. In the 2015 legislative session, the Legislature passed Senate Bill 350 (SB 350), which is discussed in more detail below. This legislation added to the Public Utilities Code language that essentially puts into statute the 2050 GHG reduction target already identified in Executive Order S-3-05, albeit in the limited context of new state policies.

Executive Order B-55-18 and AB 1279

In 2018, Governor Brown issued Executive Order B-55-18. This order establishes a statewide goal to achieved carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. This goal is in addition to the existing statewide targets of reducing GHGs, including meeting the 80 percent below 1990 levels by 2050 target. The carbon neutrality goal assumes that later than 2045, remaining emissions be offset by equivalent net removals of carbon dioxide from the atmosphere, including through sequestration in forests, soils and other natural landscapes.

In 2022, the Legislature passed Assembly Bill 1279. It establishes a policy to achieve carbon neutrality as soon as possible, but no later than 2045 and maintain net negative greenhouse gas emissions thereafter, and to ensure that by 2045, statewide anthropogenic GHGs are reduced at least 85 percent below 1990 levels. The bill requires CARB to ensure that the Scoping Plan identifies and recommends measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable carbon dioxide removal and carbon capture, utilization, and storage technologies to complement these emission reductions.

Targets for the Use of Renewable Energy for the Generation of Electricity

California Renewables Portfolio Standard

In September 2002, the Legislature enacted Senate Bill 1078, which established the Renewables Portfolio Standard program, requiring retail sellers of electricity, including electrical corporations, community choice aggregators, and electric service providers, to purchase a specified minimum percentage of electricity generated by eligible renewable energy resources such as wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas. The legislation set a target by which 20 percent of the State's electricity would be generated by renewable sources.

In September 2006, the Legislature enacted Senate Bill 107, which modified the Renewables Portfolio Standard to require that at least 20 percent of electricity retail sales be served by renewable energy resources by year 2010. In April 2011, the Legislature enacted Senate Bill X1-2, which set even a more aggressive statutory targets for renewable electricity of 33 percent by 2020.

In 2015, the Legislature enacted Senate Bill 350 that increased Renewable Portfolio Standard to require 50 percent of electricity generated to be from renewables by 2030. On September 10, 2018, former Governor Brown signed into law SB 100. SB 100 raises California's Renewable Portfolio Standard requirement to 50 percent renewable resources target by December 31, 2026, and 60 percent target by December 31, 2030. In 2022, the Legislature enacted Senate Bill 1020. SB 1020 adds interim targets to the policy framework originally established in SB 100 to require renewable energy and zero-carbon resources to supply 90 percent of all retail electricity sales by 2035 and 95 percent of all retail electricity sales by 2040. The purpose was to ensure that the state makes steady and accountable progress towards the full decarbonization of California's electricity grid.

Actions to Reducing Carbon Intensity of Vehicle Fuels

Assembly Bill 1493, Pavley Clean Cars Standards

In July 2002, the Legislature enacted Assembly Bill 1493 ("Pavley Bill"), which directed CARB to develop and adopt regulations that achieve the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks beginning with model year 2009. In September 2004, CARB approved regulations to reduce GHG emissions from new motor vehicles beginning with the 2009 model year. These regulations created what are commonly known as the "Pavley standards." In September 2009, CARB adopted amendments to the Pavley standards to reduce GHG emissions from new motor vehicles through the 2016 model year. These regulations created what are commonly known as the "Pavley II standards."

In January 2012, CARB adopted an Advanced Clean Cars program aimed at reducing both smog-causing pollutants and GHG emissions for vehicles model years 2017-2025. This historic program combined the control of smog-causing (criteria) pollutants and GHG emissions into a single coordinated set of requirements. The regulations focus on substantially increasing the number of plug-in hybrid cars and zero-emission vehicles in the vehicle fleet and on making fuels such as electricity and hydrogen readily available for these vehicle technologies. The components of the Advanced Clean Cars program are the low-emission vehicle regulations that reduce criteria pollutants and GHG emissions from light- and medium-duty vehicles, and the zero-emission vehicle regulation, which requires manufacturers to produce an increasing number of pure zero-emission vehicles (meaning battery electric and fuel cell electric vehicles), with provisions to also produce plug-in hybrid electric vehicles in the 2018 through 2025 model years.

It is expected that the Advanced Clean Car regulations will reduce GHG emissions from California passenger vehicles by about 34 percent below 2016 levels by 2025, all while improving fuel efficiency and reducing motorists' costs. Advanced Clean Cars

In January 2012, CARB adopted an Advanced Clean Cars program, which is aimed at increasing the number of plug-in hybrid cars and zero-emission vehicles in the vehicle fleet and on making fuels such as electricity and hydrogen readily available for these vehicle technologies.

On August 25, 2022, the California Air Resources Board adopted the Advanced Clean Cars II Regulations, with a plan that by 2035 all new passenger cars, trucks and SUVs sold in California will be zero emissions.

Executive Order S-01-07

This order establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In 2018, CARB passed amendments to the Low Carbon Fuel Standard that set a target to reduce fuel carbon intensity by 20 percent by 2030, compared to a 2010 baseline

Actions for Increasing Electric Vehicle Use

Executive Order B-16-12

In March 2012, former Governor Brown issued Executive Order B-16-12, which embodied a vision of a future in which zero-emission vehicles will play a big part in helping the state meet its GHG reduction targets. Executive Order B-16-12 directed state government to accelerate the market for electric vehicles in California through fleet replacement and electric vehicle infrastructure and set interim and a final 2050 target that virtually all personal transportation in the State would be zero-emission vehicles.

Senate Bill 350

In addition to setting increased renewable energy portfolio targets, this bill indirectly promotes electrification of the transportation fleet by promoting actions to enhance availability of renewable energy as a vehicle transportation energy source.

Executive Order B-48-18

In January 2018, former Governor Brown issued Executive Order B-48-18. This executive order requires that all state entities work with the private sector and all appropriate levels of government to put at least five million zero-emission vehicles on California roads by 2030. It also requires all State entities to work with the private sector and all appropriate levels of government to spur the construction and installation of 200 hydrogen fueling stations and 250,000 zero-emission vehicle chargers, including 10,000 direct current fast chargers, by 2025.

Executive Order N-79-20

In 2020, California Governor Gavin Newsom issued Executive Order N-79-20, which sets statewide goals for phasing out gasoline-powered cars and trucks in California. Under the Order, 100 percent of in-state sales of new passenger cars and trucks are to be zero-emission by 2035; 100 percent of in-state sales of medium- and heavy-duty trucks and busses are to be zero-emission by 2045, but only where feasible; and 100 percent of off-road vehicles and equipment sales are to be zero-emission by 2035 where feasible.

Cap and Trade Program

On October 20, 2011, in a related action, CARB adopted the final cap-and-trade program for California. The California cap-and-trade program creates a market-based system with an overall emissions limit for affected sectors. The program is intended to regulate more than

85 percent of California's emissions and staggers compliance requirements according to the following schedule: (1) electricity generation and large industrial sources (2012); (2) fuel combustion and transportation (2015). The statewide cap for GHG emissions from major sources commenced in 2013. This cap declines over time, achieving GHG emission reductions throughout the program's duration. The program expanded in 2015 to include fuel distributors (natural gas and propane fuel providers and transportation fuel providers) to address emissions from transportation fuels, and from combustion of other fossil fuels not directly covered at large sources in the program's initial phase.

In early 2017, former Governor Brown signed AB 398, which extended the life of the existing Cap and Trade Program through December 2030.

Statutes Intended to Facilitate Land Use Planning Consistent with Statewide Climate Objectives

California Senate Bill 375 (Sustainable Communities Strategy)

This 2008 legislation built on AB 32 by setting forth a mechanism for coordinating land use and transportation on a regional level for the purpose of reducing GHGs. The focus is to reduce miles traveled by passenger vehicles and light trucks. CARB is required to set GHG reduction targets for each metropolitan region. Each of California's metropolitan planning organizations then prepares a sustainable communities strategy that demonstrates how the region will meet its GHG reduction target through integrated land use, housing, and transportation planning. Once adopted by the metropolitan planning organizations, the sustainable communities strategy is to be incorporated into that region's federally enforceable regional transportation plan. If a metropolitan planning organization is unable to meet the targets through the sustainable communities strategy, then an alternative planning strategy must be developed that demonstrates how targets could be achieved, even if meeting the targets is deemed to be infeasible.

Local agencies that adopt land use, housing, and transportation policies that are consistent with and facilitate implementation of the related GHG reduction strategies in a sustainable communities strategy benefit through potential CEQA streamlining for qualifying projects proposed within their boundaries.

Climate Change Scoping Plans

Under AB 32 as described above, CARB must release an updated Climate Change Scoping Plan at least every five years. Each scoping plan must identify the strategies the state is implementing to meet its GHG reduction targets and report on the progress made in meeting the targets.

The first 2008 Scoping Plan laid out the goal of reducing greenhouse gas (GHG) emissions back down to 1990 levels by 2020. The 2013 update measured progress and fine-tuned programs toward the 2020 goal and highlighted the need to focus on short-lived climate pollutants. The 2017 update shifted focus to the SB 32 goal of a 40 percent reduction below 1990 levels by 2030 by laying out a detailed cost-effective and technologically feasible path to this target and assessed progress towards achieving the AB 32 goal of returning to 1990 GHG levels by 2020. The 2020 goal was ultimately reached in 2016 - four years ahead of the schedule called for under AB 32.

The 2022 Scoping Plan update assesses progress toward achieving the statutory 2030 target identified in SB 32, while laying out a path to achieving carbon neutrality no later than 2045. The 2022 Scoping Plan update focuses on outcomes needed to achieve carbon neutrality by assessing paths for clean technology, energy deployment, natural and working lands, and

others, and is designed to meet the State’s long-term climate objectives and support a range of economic, environmental, energy security, environmental justice, and public health priorities. This is the first Scoping Plan that adds carbon neutrality as a science-based guide beyond statutorily established emission reduction targets. Previous plans focused on specific GHG reduction targets for the industrial, energy, and transportation sectors—to meet 1990 levels by 2020, and then the more aggressive 40 percent below that for the 2030 target. Carbon neutrality takes it one step further by expanding actions to capture and store carbon including through natural and working lands and mechanical technologies, while drastically reducing anthropogenic sources of carbon pollution.

Building Code Requirements Intended to Reduce GHG Emissions

California Energy Code

The California Energy Code (California Code of Regulations, Title 24, Part 6), which is incorporated into the California Building Standards Code, was first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The California Energy Code is updated every three years by the California Energy Commission as the Building Energy Efficiency Standards (BEES) to allow consideration and possible incorporation of new energy efficiency technologies and construction methods. Although the BEES were not originally intended to reduce GHG emissions, increased energy efficiency results in decreased GHG emissions because energy efficient buildings require less electricity. The California Building Standards Code is enforceable at the project-level. Energy standards have supported California’s long-term strategy to meet energy demand, and conserve resources. The Energy Code governs window and door materials, lighting, electrical panels, insulation, faucets and additional building features. The requirements vary between home and business buildings, as well as among climate zones in which they are implemented. The current 2022 Energy Code updates the prior 2019 code by requiring actions/features that continue to support California’s gradual transition away from use of fossil fuels, and improve environmental quality.

California Green Building Standards Code

The purpose of the California Green Building Standards Code (California Code of Regulations Title 24, Part 11) (“CALGreen”) is to improve public health and safety and to promote the general welfare by enhancing the design and construction of buildings through the use of building concepts having a reduced negative impact or positive environmental impact and encouraging sustainable construction practices in the following categories: 1) planning and design; 2) energy efficiency; 3) water efficiency and conservation; 4) material conservation and resource efficiency; and 5) environmental quality. The code requires all new buildings in the state to be more energy efficient and environmentally responsible.

These comprehensive regulations are intended to achieve major reductions in interior and exterior building energy consumption. CALGreen institutes mandatory minimum environmental performance standards for all ground-up new construction of commercial, residential, and state-owned buildings, as well as schools and hospitals. CALGreen includes mandatory standards that address:

- Planning and Design (e.g., stormwater, bicycle facilities, clean air vehicles, EV support infrastructure, light pollution and grading and paving);
- Water Efficiency (metering, conserving fixtures, landscaping, outdoor recycle water supply);
- Materials Conservation and Efficiency (moisture control, construction waste management, soil and debris management, recycling, systems commissioning, etc.); and
- Environmental Quality (fireplaces and woodstoves, ducting, paints, carpets, flooring, interior air quality, noise, ozone and refrigerants, etc.).

The current 2022 CALGreen code is in effect until December 31, 2025. Updates were adopted in July 2022, took effect on January 1, 2023. The primary changes in the 2022 code are to planning and design standards. The 2022 update encourages efficient electric heat pumps, establishes electric-ready requirements for new homes, expands solar photovoltaic and battery storage standards, strengthens ventilation standards, and promote electrification of the vehicle fleet by expanding standards for electric vehicle infrastructure (e.g., electric vehicle charging stations) for residential and non-residential development. These electric vehicle changes promote electrification of the vehicle fleet by expanding standards for electric vehicle infrastructure (e.g., electric vehicle charging stations) for residential and non-residential development. Changes in the water efficiency, materials conservations, and environmental quality standards were limited.

Regional/Local

Humboldt County General Plan

The Humboldt County General Plan contains the following goals, policies, and standards relevant to GHG emissions and the proposed project:

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.

In addition to the policies listed in the General Plan, Humboldt County is also in the process of preparing an updated draft Humboldt Regional Climate Action Plan aimed at reducing GHG emissions throughout region. The plan will examine strategies focused on reducing emissions from vehicle travel, electricity use, natural gas consumption and other sources of greenhouse gases at the local level and is anticipated for release prior to the end of 2024.

Pursuant to CEQA Guidelines section 15183.5, once the draft Humboldt Regional Climate Action Plan is adopted as a qualified plan for reducing GHG emissions, the GHG impacts of future individual projects proposed within the project site can be found to be less than significant provided the applicable GHG reduction measures in the qualified plan are required as mitigation measures or conditions of approval.

McKinleyville Town Center Q-Zone Regulations

There are a number of proposed features outlined in the in the McKinleyville Town Center Q-Zone, particularly in Section 4 Connectivity, that if implemented would reduce GHG emissions. The referenced design features include:

- **4.1.3 Bicycle and Pedestrian Connections.** On-street and off-street bicycle trails and pedestrian connections including:
 - **4.1.3.1** East-West Trail linking McKinleyville Avenue on the west with Pierson Park on the east, running though the existing shopping center and crossing Central at Gwin. This will connect the open space on the west with the park on the east.
 - **4.1.3.2** North-South connector linking the Mid-Town trail.
 - **4.1.3.3** Class I bicycle path along Hiller connecting McKinleyville Ave and Central.

- **4.1.4 Transit Facilities.** There shall be an enhanced transit facility located with convenient access to Central Avenue providing simultaneous loading space for multiple buses, bike lockers, and if grant or other funding is available space for park and ride. This shall be constructed and operational before 50% of the buildable town center area is developed.
- **5.2.3.1** A minimum of five bicycle parking spaces shall be provided for any mixed use or commercial development project of more than 10,000 square feet.

9.3 Thresholds of Significance

CEQA Guidelines Appendix G is a sample initial study checklist that includes a number of factual inquiries related to the subject of GHGs, as it does on a whole series of additional environmental topics. Lead agencies are under no obligation to use these inquiries in fashioning thresholds of significance on the subject of GHG impacts, or on any subject addressed in the checklist. Rather, with few exceptions, CEQA grants agencies discretion to develop their own thresholds of significance. Even so, it is a common practice for lead agencies to take the language from the inquiries included in Appendix G and to use that language in fashioning thresholds. Therefore, for purposes of this EIR, a significant impact would occur if implementation of the proposed project would:

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

9.4 Analysis, Impacts, and Mitigation Measures

This section includes information regarding GHG related issues that are relevant to the proposed project based on the thresholds of significance described above.

Generation of Greenhouse Gas Emissions

IMPACT 9-1	Generation of Greenhouse Gas Emissions	Less than Significant with Mitigation
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The GHG impacts of a project can be found to be less than significant if the project is consistent with a qualified plan for reducing GHG emissions. However, neither the County nor the local air district, the North Coast Unified Air Quality Management District, has adopted a GHG reduction plan that might be referenced for the analysis. Although the County is preparing an updated climate action plan, it had not been adopted at the time this EIR was circulated for public review.

Given the absence of a local or regional plan for reducing GHGs or adopted threshold of significance, the County has elected to reference guidance provided by the adjacent air district, the Bay Area Air Quality Management District (BAAQMD) for evaluating the GHG impacts of the project. That guidance is found in the *2022 CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans* (Bay Area Air Quality Management District 2022). The guidance is not regulatory, but rather is available for reference and use by local lead agencies as a plan for reducing GHG emissions that is supported by substantial evidence. The guidance utilizes a performance standard-based analysis approach for evaluating GHG impacts. The guidance focuses on standards that should be incorporated into the design/operations of individual land use projects for such projects to contribute their fair share towards meeting the state's 2045 carbon neutrality goal as reflected in AB 1279. AB 1279 establishes the policy of the state to achieve carbon neutrality as soon as possible, but no later than 2045 and maintain net negative GHG emissions thereafter, and to ensure that by 2045 statewide anthropogenic GHGs are reduced at least 85 percent below 1990 levels. AB 1279 represents the state's most recent GHG reduction goals and the County has elected to align its GHG impact analysis approach with that goal.

BAAQMD's guidance defines that a project which meets the following performance standards would have a less than significant impact because it would contribute its fair share towards meeting the state's 2045 carbon neutrality goal:

1. Buildings
 - a. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development).
 - b. The project will not result in any wasteful, inefficient, or unnecessary energy usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines.
2. Transportation
 - a. Achieve a reduction in project-generated vehicle miles traveled (VMT) below the regional average consistent with the current version of the California Climate Change Scoping Plan (currently 15 percent) or meet a locally adopted Senate Bill 743 VMT target, reflecting the recommendations provided in the Governor's Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA:
 - i. Residential projects: 15 percent below the existing VMT per capita

- ii. Office projects: 15 percent below the existing VMT per employee
- iii. Retail projects: no net increase in existing VMT
- b. Achieve compliance with off-street electric vehicle requirements in the most recently adopted version of CALGreen Tier 2.

If a land use project meets these performance standards, it would be considered consistent with efforts to achieve California’s long-term climate goals of carbon neutrality and an agency reviewing the project under CEQA could conclude that the project will not make a cumulatively considerable contribution to global climate change. Projects that do not meet these standards would have a significant GHG impact climate impact because they would hinder the state’s efforts to meet its carbon neutrality goal. The BAAQMD guidance is generally applicable to residential, commercial, and office uses, the types of proposed uses within the Town Center.

Each of the performance standards is summarized below for reference.

Performance Standard 1: No Natural Gas

Energy used in residential and nonresidential buildings in California comes primarily from natural gas and electricity, the generation and consumption of which can result in GHG emissions. Natural gas usage emits GHGs directly when it is burned for space heating, cooking, hot water heating and similar uses, whereas electricity usage emits GHGs indirectly to the extent that it is generated by burning carbon-based fuels. For the building sector to achieve carbon neutrality, natural gas usage will need to be phased out and replaced with electricity usage, and electrical generation will need to shift to 100-percent carbon-free sources. To support these shifts, future projects should be required to be built without natural gas infrastructure, and instead, but constructed as all electric. Using electric instead of natural gas-powered appliances and end uses replaces a more emissions-intensive fossil fuel source of energy with a less emissions-intensive source of energy, electricity from the grid that is increasingly transitioning to renewable sources.

Performance Standard 2: Less than Significant Energy Impacts

CEQA requires lead agencies to evaluate a project’s potential for wasteful, inefficient, or unnecessary energy usage under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines, along with State CEQA Guidelines Appendix F and Appendix G, Section VI. BAAQMD recommends using the results of this analysis to determine whether the project will implement its “fair share” with respect to supporting the implementation of SB 100, the 100 Percent Clean Energy Act of 2018. SB 100 strengthened the State’s Renewables Portfolio Standard (RPS) by requiring that 60 percent of all electricity provided to retail users in California come from renewable sources by 2030 and that 100 percent come from carbon-free sources by

2045. Eliminating GHG emissions associated with building electricity usage will be achieved by decarbonizing California’s electrical generation infrastructure. California has committed to achieving this goal by 2045 through SB 100.

If the energy analysis required under CEQA Section 21100(b)(3) shows that a project will not result in wasteful, inefficient, or unnecessary energy use, then it will be consistent with implementing SB 100 and will not make a cumulatively considerable climate impact with respect to building electrical usage. If the project is found to involve wasteful, inefficient, or unnecessary energy usage, then the lead agency should conclude that it will make a cumulatively considerable impact and treat it as significant in this regard.

As described in Section 8.0, Energy, the energy impacts of the proposed project were found to be less than significant.

Performance Standard 3: Electric Vehicle Ready

The requirements for EV charging infrastructure in new land use development projects are governed by the CALGreen regulatory standards. These standards are set forth in Title 24 of the California Code of Regulations, and they are regularly updated on a three-year cycle. The CALGreen standards consist of a set of mandatory standards for new development, as well as two sets of voluntary standards known as Tier 1 and Tier 2. Although the Tier 1 and Tier 2 standards are voluntary, they often form the basis of future mandatory standards adopted in subsequent updates. The voluntary standards outline more aggressive actions than do the mandatory standards.

Providing electric vehicle charging infrastructure per Tier 2 standards increases fuel redundancy for electric vehicles even if an extreme weather event disrupts other fuel sources, as well as reduces GHG emissions. This will enable drivers of electric and hybrid (electric and gasoline) vehicles to drive a larger share of miles, thereby displacing GHG emissions from gasoline consumption with a lower volume indirect emission from renewable electricity.

Performance Standard 4: Less Than Significant Vehicle Miles Traveled (VMT) Impact

New land use projects can influence transportation-related GHG emissions by reducing the number of VMT the project would generate. Motor vehicle transportation does not need to be eliminated entirely in order for the land use sector to achieve carbon neutrality, as carbon-free vehicle technology can be used (e.g., EVs powered by carbon-free electricity sources). But for that goal to be realistically implemented by 2045, California will need to reduce its per-capita VMT. How land use development is designed and sited can have a significant influence on how much VMT the project will generate. New land use projects need to provide alternatives to motor vehicle–based transportation such that VMT per capita can be reduced to levels consistent with achieving carbon neutrality by 2045.

As noted in Section 4.0, Project Description, and reiterated above in Section 9.2, Regulatory Setting, the Q-Zone regulations and associated road diet design proposed for Central Avenue and Hiller Road identify pedestrian and bicycle connectivity requirements and a requirement for constructing a transit center within the project site. These features, the mixed-use land use design, and the fact that the project is planned on an infill site, all contribute to reducing project VMT. VMT impacts of the project are discussed in Section 13.0, Transportation. The VMT analysis summarized there, which was conducted consistent with guidance provided by the California Office of Planning and Research for implementing the VMT reduction targets in Senate Bill 743, concludes that the project would have a less-than-significant VMT impact.

Summary of Project Consistency with GHG Performance Standards

As summarized above, the energy and VMT performance standards are met. However, the standards for eliminating natural gas infrastructure and implementing EV infrastructure are not explicitly met through Q-Zone regulations or in other County regulations that apply to future development within the project site. Consequently, GHG impacts are significant in the absence of mitigation. Mitigation measure 9-1 requires that all future individual projects be constructed without permanent natural gas infrastructure and incorporate EV infrastructure consistent with CALGreen Tier 2 requirements. With implementation of this mitigation, all four performance measures would be met and GHG impacts would be less than significant.

Mitigation Measure

- 9-1 All future individual project developers shall design their projects to meet the following GHG emissions reduction performance standards:
- a. All future individual development projects shall be constructed as all-electric. Construction/installation of permanent natural gas plumbing/infrastructure is prohibited.
 - b. All future individual development projects shall include EV support infrastructure consistent with the Tier 2 standards contained in the CALGreen code in effect at the time individual project applications are deemed complete by the County.

Plans for all future individual projects shall be reviewed by the County of Humboldt Chief Building Official or Chief Building Official's designee prior to approval of individual project entitlements to ensure that the performance standards are incorporated into project plans. Verification of development consistent with the performance standards shall be assured prior to approval of occupancy permits.

Conflict with a GHG Reduction Plan

IMPACT 9-2	Conflict with an Applicable Plan, Policy, or Regulation for Reducing Greenhouse Gases	Less than Significant with Mitigation
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Neither the air district nor the County have adopted a qualified plan for reducing GHG emissions for which consistency of the proposed project can be assessed. For this reason, BAAQMD’s guidance, described in the *2022 CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans*, is referenced as an applicable plan for reducing GHG emissions. Compliance of individual future projects within the site with the GHG reduction performance standards in that guidance, detailed above, can be used to determine whether the proposed project conflicts with the applicable GHG reduction plan.

As described in the impact 9-1 discussion above, the project as defined does not meet two of the four performance standards. Therefore, without mitigation, the project would conflict with the applicable plan for reducing GHG emissions. Implementation of mitigation measure 9-1 would ensure that these performance standards are met and that the proposed project would have a less-than-significant impact from conflict with the applicable plan for reducing GHG emissions.

Life Plan Humboldt Project

Life Plan Humboldt would have no new or more severe GHG impacts than assumed for the project as a whole. Its contribution to GHG impacts is assumed as part of the overall project impact analysis. Mitigation measures that are applicable to the project as a whole are also applicable to the Life Plan Humboldt project as a means to reduce its contribution to significant impacts of the Town Center project.