

4.6 Greenhouse Gas Emissions

This section summarizes the setting for greenhouse gas (GHG) emissions and climate change and analyzes the impacts related to GHG emissions and climate change due to the project.

4.6.1 Setting

a. Greenhouse Gases and Climate Change

Gases that absorb and re-emit infrared radiation in the atmosphere are called GHGs. The gases that are widely seen as the principal contributors to human-induced climate change include carbon dioxide (CO₂); methane (CH₄); nitrous oxides (N₂O); fluorinated gases such as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs); and sulfur hexafluoride (SF₆). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

Different types of GHGs have varying global warming potentials (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO₂) is used to relate the amount of heat absorbed to the amount of the gas emitted, referred to as “carbon dioxide equivalent” (CO₂e), which is the amount of GHG emitted multiplied by its GWP. Carbon dioxide has a 100-year GWP of one. By contrast, methane has a 100-year GWP of 30, meaning its global warming effect is 30 times greater than CO₂ on a molecule per molecule basis (United Nations Intergovernmental Panel on Climate Change [IPCC] 2021).¹

GHGs are emitted by natural processes and human activities. Of these gases, CO₂ and CH₄ are emitted in the greatest quantities from human activities. Emissions of CO₂ are usually by-products of fossil fuel combustion, and CH₄ results from off-gassing associated with agricultural practices and landfills. Human-made GHGs, many of which have greater heat-absorption potential than CO₂, include fluorinated gases and SF₆ (United States Environmental Protection Agency [USEPA] 2021a).

Climate change is the observed increase in the average temperature of the Earth’s atmosphere and oceans along with other substantial changes in climate (such as wind patterns, precipitation, and storms) over an extended period. The term “climate change” is often used interchangeably with the term “global warming,” but climate change is preferred because it conveys that other changes are happening in addition to rising temperatures. The baseline against which these changes are measured originates in historical records that identify temperature changes that occurred in the past, such as during previous ice ages. The global climate is changing continuously, as evidenced in the geologic record which indicates repeated episodes of substantial warming and cooling. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming over the past 150 years. The United Nations Intergovernmental Panel on Climate Change (IPCC) expressed in their Sixth Assessment Report that the rise and continued growth of atmospheric CO₂ concentrations is unequivocally due to human activities (IPCC 2021). Human influence has warmed the atmosphere, ocean, and land, which has led the climate to

¹ The Intergovernmental Panel on Climate Change’s (2021) *Sixth Assessment Report* determined that methane has a GWP of 30. However, the 2017 Climate Change Scoping Plan published by the California Air Resources Board uses a GWP of 25 for methane, consistent with the Intergovernmental Panel on Climate Change’s (2007) *Fourth Assessment Report*. Therefore, this analysis utilizes a GWP of 25.

warm at an unprecedented rate in the last 2,000 years. It is estimated that between the period of 1850 through 2019, that a total of 2,390 gigatons of anthropogenic CO₂ was emitted. It is likely that anthropogenic activities have increased the global surface temperature by approximately 1.07 degrees Celsius between the years 2010 through 2019 (IPCC 2021). Furthermore, since the late 1700s, estimated concentrations of CO₂, methane, and nitrous oxide in the atmosphere have increased by over 43 percent, 156 percent, and 17 percent, respectively, primarily due to human activity (USEPA 2021a). Emissions resulting from human activities are thereby contributing to an average increase in Earth's temperature

The accumulation of GHGs in the atmosphere regulates the earth's temperature. Without the natural heat-trapping effect of GHGs, the earth's surface would be about 33 degrees Celsius (°C) cooler (World Meteorological Organization 2020). However, since 1750, estimated concentrations of CO₂, CH₄, and N₂O in the atmosphere have increased by 47 percent, 156 percent, and 23 percent, respectively, primarily due to human activity (IPCC 2021). GHG emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, are believed to have elevated the concentration of these gases in the atmosphere beyond the level of concentrations that occur naturally.

b. Greenhouse Gas Emissions Inventory

Global Emissions Inventory

In 2015, worldwide anthropogenic GHG emissions totaled 47,000 million metric tons (MT) of CO₂e, which is a 43 percent increase from 1990 GHG levels (USEPA 2021b). Specifically, 34,522 million metric tons (MMT) of CO₂e of CO₂, 8,241 MMT of CO₂e of CH₄, 2,997 MMT of CO₂e of N₂O, and 1,001 MMT of CO₂e of fluorinated gases were emitted in 2015. The largest source of GHG emissions were energy production and use (includes fuels used by vehicles and buildings), which accounted for 75 percent of the global GHG emissions. Agriculture uses and industrial processes contributed 12 percent and six percent, respectively. Waste sources contributed for three percent and two percent was due to international transportation sources. These sources account for approximately 98 percent because there was a net sink of two percent from land-use change and forestry. (USEPA 2021b).

United States Emissions Inventory

Total U.S. GHG emissions were 6,558 MMT of CO₂e in 2019. Emissions decreased by 1.7 percent from 2018 to 2019; since 1990, total U.S. emissions have increased by an average annual rate of 0.06 percent for a total increase of 1.8 percent between 1990 and 2019. The decrease from 2018 to 2019 reflects the combined influences of several long-term trends, including population changes, economic growth, energy market shifts, technological changes such as improvements in energy efficiency, and decrease carbon intensity of energy fuel choices. In 2019, the industrial and transportation end-use sectors accounted for 30 percent and 29 percent, respectively, of nationwide GHG emissions while the commercial and residential end-use sectors accounted for 16 percent and 15 percent of nationwide GHG emissions, respectively, with electricity emissions distributed among the various sectors (USEPA 2021c).

California Emissions Inventory

Based on the California Air Resources Board (CARB) California Greenhouse Gas Inventory for 2000-2019, California produced 418.2 MMT of CO₂e in 2019, which is 7.2 MMT of CO₂e lower than 2018 levels. The major source of GHG emissions in California is the transportation sector, which comprises 40 percent of the state's total GHG emissions. The industrial sector is the second largest source, comprising 21 percent of the state's GHG emissions, while electric power accounts for approximately 14 percent (CARB 2021a). The magnitude of California's total GHG emissions is due in part to its large size and large population compared to other states. However, its relatively mild climate is a factor that reduces California's per capita fuel use and GHG emissions as compared to other states. In 2016, the State of California achieved its 2020 GHG emission reduction target of reducing emissions to 1990 levels as emissions fell below 431 MMT of CO₂e (CARB 2021a). The annual 2030 statewide target emissions level is 260 MMT of CO₂e (CARB 2017).

Local Emissions Inventory

Based on the City of Ukiah's Draft 2014 Climate Action Plan, the City generated around 144,625 MT of CO₂e in 2010 (City of Ukiah 2014). On-road transportation was the major source accounting for 51.1 percent of the total, largely due to passenger vehicles, but also commercial trips and buses. The City landfill was the second biggest source of emissions at 21.1 percent. Residential natural gas usage and commercial natural gas usage represented 10 percent and 6.4 percent respectively, while residential electricity usage and commercial electricity usage represented 1.2 percent and 2.2 percent. Solid waste accounted for 1.8 percent of the total emissions. Agricultural equipment accounted for 2.9 percent. Off-road transportation accounted for 3 percent. The remaining 0.3 percent is primarily from wastewater treatment. Water conveyance and stationary sources represent about 0.1 percent of the total emissions (City of Ukiah 2014).

c. Potential Effects of Climate Change

Globally, climate change has the potential to affect numerous environmental resources though potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. Each of the past three decades has been warmer than all the previous decades in the instrumental record, and the decade from 2000 through 2010 has been the warmest. The observed global mean surface temperature from 2015 to 2017 was approximately 1.0°C higher than the average global mean surface temperature over the period from 1880 to 1900 (National Oceanic and Atmospheric Administration 2020). Furthermore, several independently analyzed data records of global and regional Land-Surface Air Temperature obtained from station observations jointly indicate that Land-Surface Air Temperature and sea surface temperatures have increased.

According to *California's Fourth Climate Change Assessment*, statewide temperatures from 1986 to 2016 were approximately 0.6 to 1.1°C higher than those recorded from 1901 to 1960. Potential impacts of climate change in California may include reduced water supply from snowpack, sea level rise, more extreme heat days per year, more large forest fires, and more drought years (State of California 2018). In addition to statewide projections, *California's Fourth Climate Change Assessment* includes regional reports that summarize climate impacts and adaptation solutions for nine regions of the state and regionally specific climate change case studies (State of California 2018). However, while there is growing scientific consensus about the possible effects of climate change at a global and statewide level, current scientific modeling tools are unable to predict what

local impacts may occur with a similar degree of accuracy. A summary follows of some of the potential effects that could be experienced in California as a result of climate change.

Air Quality

Scientists project that the annual average maximum daily temperatures in California could rise by 2.4 to 3.2°C in the next 50 years and by 3.1 to 4.9°C in the next century (State of California 2018). Higher temperatures are conducive to air pollution formation, and rising temperatures could therefore result in worsened air quality in California. As a result, climate change may increase the concentration of ground-level ozone. The magnitude of the effect of the increased concentration of ground-level ozone, and therefore its indirect effects, are uncertain. In addition, as temperatures have increased in recent years, the area burned by wildfires throughout the state has increased, and wildfires have occurred at higher elevations in the Sierra Nevada Mountains (State of California 2018). If higher temperatures continue to be accompanied by an increase in the incidence and extent of large wildfires, air quality could worsen. Severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains could tend to temporarily clear the air of particulate pollution, which would effectively reduce the number of large wildfires and thereby ameliorate the pollution associated with them (California Natural Resources Agency 2009).

Water Supply

Analysis of paleoclimatic data (such as tree-ring reconstructions of stream flow and precipitation) indicates a history of naturally and widely varying hydrologic conditions in California and the west, including a pattern of recurring and extended droughts. Uncertainty remains with respect to the overall impact of climate change on future precipitation trends and water supplies in California. Year-to-year variability in statewide precipitation levels has increased since 1980, meaning that wet and dry precipitation extremes have become more common (California Department of Water Resources 2018). This uncertainty regarding future precipitation trends complicates the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood. The average early spring snowpack in the western U.S., including the Sierra Nevada Mountains, decreased by about 10 percent during the last century. During the same period, sea level rose over 0.15 meter along the central and southern California coasts (State of California 2018). The Sierra snowpack provides most of California's water supply as snow that accumulates during wet winters is released slowly during the dry months of spring and summer. A warmer climate is predicted to reduce the fraction of precipitation that falls as snow and the amount of snowfall at lower elevations, thereby reducing the total snowpack (State of California 2018). Projections indicate that average spring snowpack in the Sierra Nevada and other mountain catchments in central and northern California will decline by approximately 66 percent from its historical average by 2050 (State of California 2018).

Hydrology and Sea Level Rise

Climate change could affect the intensity and frequency of storms and flooding (State of California 2018). Furthermore, climate change could induce substantial sea level rise in the coming century. Rising sea level increases the likelihood of and risk from flooding. The rate of increase of global mean sea levels between 1993 to 2022, observed by satellites, is approximately 3.5 millimeters per year, double the twentieth century trend of 1.6 millimeters per year (World Meteorological

Organization 2013; National Aeronautics and Space Administration 2022). Sea levels are rising faster now than in the previous two millennia, and the rise will probably accelerate, even with robust GHG emission control measures. While the City is no close to the Pacific coast, sea level rise may jeopardize California's water supply due to saltwater intrusion and induce groundwater flooding and/or exposure of buried infrastructure (State of California 2018).

Agriculture

California has an over \$50 billion annual agricultural industry that produces over a third of the country's vegetables and two-thirds of the country's fruits and nuts (California Department of Food and Agriculture 2020). Higher CO₂ levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, certain regions of agricultural production could experience water shortages of up to 16 percent, which would increase water demand as hotter conditions lead to the loss of soil moisture. In addition, crop yield could be threatened by water-induced stress and extreme heat waves, and plants may be susceptible to new and changing pest and disease outbreaks (State of California 2018). Temperature increases could also change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (California Climate Change Center 2006).

Ecosystems

Climate change and the potential resultant changes in weather patterns could have ecological effects on the global and local scales. Soil moisture is likely to decline in many regions because of higher temperatures, and intense rainstorms are likely to become more frequent. Rising temperatures could have four major impacts on plants and animals: timing of ecological events; geographic distribution and range of species; species composition and the incidence of nonnative species within communities; and ecosystem processes, such as carbon cycling and storage (Parmesan 2006; State of California 2018).

d. Local Effects of Climate Change

While the above discussion identifies the possible effects of climate change at a global and potentially statewide level, regional and local predictions are often based on downscaling statewide models. Observable effects of climate change have already been witnessed on the environment. The City of Ukiah has specific vulnerabilities due to the changing climate that create the need for local adaptation measures (City of Ukiah 2014). In particular, the main concerns include the following:

- **Reduced snowpack.** In the eastern, higher-elevation portion of the North Coast region, March snow levels will drop to almost zero by the 2090s, a decrease of two to ten inches from 2010 levels. In areas with currently little snow (less than three inches), such as Ukiah, the snowpack is projected to be near zero by 2050.
- **Increased wildfires.** The North Coast region is projected to experience substantial increase in fire risk. By 2050, the region will experience modest increases in area burned. By 2100, the projected wildfire frequency increases dramatically, eight times greater in parts of Mendocino County. Northern Mendocino County is projected to have up to 2.5 times greater wildfire frequency.
- **Temperature increases.** January temperatures are predicted to increase by about 2 degrees Fahrenheit by 2050 and up to 5 degrees Fahrenheit by the year 2100 within the North Coast region. July increases in average temperatures are anticipated to be 3 degrees Fahrenheit and 6 degrees Fahrenheit by the year 2100.

- **Reduced precipitation.** The North Coast region is expected to experience a subtle decrease in precipitation in most areas throughout the century. The City of Ukiah is projected to see a decrease of around three to 4 inches by 2050, and 6 inches of precipitation by 2100. Reduced precipitation will adversely impact the water supply of the City, region, and State.
- **Public health and heat.** Ukiah is not projected to see a large increase in the number of heat waves, defined regionally as five consecutive days with temperatures as high as 93°F. Little change is expected by 2050 with possibly one to three more heat waves projected in region. By 2100, projected heat waves are more variable, with predictions of between two and eight more heat waves per year. However, when heat waves do occur, vulnerable populations in Ukiah may be severely affected because of a historic lack of adaptive capacity having to do with historically milder temperatures. Frequent heat waves can have the greatest impact on the elderly and children less than five years of age. Mendocino County is one of the state's counties with the highest proportion of elderly living alone.

4.6.2 Regulatory Setting

a. Federal Regulations

Federal Clean Air Act

The U.S. Supreme Court determined in *Massachusetts et al. v. Environmental Protection Agency et al.* ([2007] 549 U.S. 05-1120) that the USEPA has the authority to regulate motor vehicle GHG emissions under the federal Clean Air Act. The USEPA issued a Final Rule for mandatory reporting of GHG emissions in October 2009. This Final Rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufacturers of heavy-duty and off-road vehicles and vehicle engines and requires annual reporting of emissions. In 2012, the USEPA issued a Final Rule that established the GHG permitting thresholds that determine when Clean Air Act permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities.

In *Utility Air Regulatory Group v. Environmental Protection Agency* (134 Supreme Court 2427 [2014]), the U.S. Supreme Court held the USEPA may not treat GHGs as an air pollutant for purposes of determining whether a source can be considered a major source required to obtain a Prevention of Significant Deterioration or Title V permit. The Court also held that Prevention of Significant Deterioration permits otherwise required based on emissions of other pollutants may continue to require limitations on GHG emissions based on the application of Best Available Control Technology.

Safer Affordable Fuel-Efficient Vehicles Rule

On September 27, 2019, the USEPA and the National Highway Traffic Safety Administration published the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program. The SAFE Rule Part One revokes California's authority to set its own GHG emissions standards and to adopt its own zero-emission vehicle mandates. On April 30, 2020, the USEPA and the National Highway Traffic Safety Administration published Part Two of the SAFE Vehicles Rule, which revised corporate average fuel economy and CO₂ emissions standards for passenger cars and trucks of model years 2021-2026 such that the standards increase by approximately 1.5 percent each year through model year 2026, as compared to the approximately 5 percent annual increase required under the 2012 standards (National Highway Traffic Safety Administration 2022). To account for the

effects of the SAFE Vehicles Rule, CARB released off-model adjustment factors on June 26, 2020, to adjust GHG emissions outputs from the EMFAC model (CARB 2020).

b. State Regulations

CARB is responsible for the coordination and oversight of State and local air pollution control programs in California. There are numerous regulations aimed at reducing the state's GHG emissions. These initiatives are summarized below.

California Advanced Clean Cars Program

Assembly Bill (AB) 1493 (2002), California's Advanced Clean Cars program (referred to as "Pavley"), requires CARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, the USEPA granted the waiver of Clean Air Act preemption to California for its GHG emission standards for motor vehicles, beginning with the 2009 model year, which allows California to implement more stringent vehicle emission standards than those promulgated by the USEPA. Pavley I regulates model years from 2009 to 2016 and Pavley II, now referred to as "LEV (Low Emission Vehicle) III GHG," regulates model years from 2017 to 2025. The Advanced Clean Cars program coordinates the goals of the LEV, Zero Emissions Vehicles (ZEV), and Clean Fuels Outlet programs and would provide major reductions in GHG emissions. By 2025, the rules will be fully implemented, and new automobiles will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions from their model year 2016 levels (CARB 2011).

California Global Warming Solutions Act of 2006 (Assembly Bill 32 and Senate Bill 32)

The "California Global Warming Solutions Act of 2006," (AB 32), outlines California's major legislative initiative for reducing GHG emissions. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions. Based on this guidance, CARB approved a 1990 statewide GHG level and 2020 target of 431 MMT of CO₂e, which was achieved in 2016. CARB approved the Scoping Plan on December 11, 2008, which included GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among others (CARB 2008). Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards, and Cap-and-Trade) have been adopted since the Scoping Plan's approval.

The CARB approved the 2013 Scoping Plan update in May 2014. The update defined the CARB's climate change priorities for the next five years, set the groundwork to reach post-2020 statewide goals, and highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the state's longer term GHG reduction strategies with other state policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014).

On September 8, 2016, the governor signed Senate Bill (SB) 32 into law, extending the California Global Warming Solutions Act of 2006 by requiring the state to further reduce GHG emissions to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged). On December 14, 2017, the CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the

2030 target. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, and implementation of recently adopted policies and legislation, such as SB 1383 and SB 100 (discussed below). The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2013 Scoping Plan update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of 6 MT of CO₂e by 2030 and 2 MT of CO₂e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (city, county, sub-regional, or regional level), but not for specific individual projects because they include all emissions sectors in the state (CARB 2017).

Senate Bill 375

The Sustainable Communities and Climate Protection Act of 2008 (SB 375), signed in August 2008, enhances the state’s ability to reach AB 32 goals by directing the CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPO’s Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy (categorized as “transit priority projects”) can receive incentives to streamline CEQA processing.

The City of Ukiah is within the Mendocino Council of Governments (MCOG), which is a non-MPO Rural Regional Transportation Planning Area (RTPA). Non-MPO Rural RTPAs are not required to prepare CARB-certified SCS. MCOG’s most recent RTP was adopted in February 2018 and includes policies that support achieving targets established by SB 375, which are discussed under *Regional and Local Regulations* (MCOG 2018).

California Integrated Waste Management Act (Assembly Bill 341)

The California Integrated Waste Management Act of 1989, as modified by AB 341 in 2011, requires each jurisdiction’s source reduction and recycling element to include an implementation schedule that shows: (1) diversion of 25 percent of all solid waste by January 1, 1995, through source reduction, recycling, and composting activities and (2) diversion of 50 percent of all solid waste on and after January 1, 2000.

Senate Bill 1383

Adopted in September 2016, SB 1383 (Lara, Chapter 395, Statutes of 2016) requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. SB 1383 requires the strategy to achieve the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires the California Department of Resources Recycling and Recovery (CalRecycle), in consultation with the CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills.

Senate Bill 100

Adopted on September 10, 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's Renewables Portfolio Standard (RPS) Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045. The 2020 goal was met, with approximately 36 percent of electricity coming from renewable sources in March 2021 (CARB 2021b).

Executive Order B-55-18

On September 10, 2018, the former Governor Brown issued Executive Order (EO) B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

California Building Standards Code

The California Code of Regulations (CCR) Title 24 is referred to as the California Building Standards Code. It consists of a compilation of several distinct standards and codes related to building construction, including plumbing, electrical, interior acoustics, energy efficiency, and handicap accessibility for persons with physical and sensory disabilities. The current iteration is the 2019 Title 24 standards. The California Building Standards Code's energy-efficiency and green building standards are outlined below.

Part 6 – Building Energy Efficiency Standards/Energy Code

CCR Title 24, Part 6 is the Building Energy Efficiency Standards or California Energy Code. This code, originally enacted in 1978, establishes energy-efficiency standards for residential and non-residential buildings to reduce California's energy demand. New construction and major renovations must demonstrate their compliance with the current Energy Code through submittal and approval of a Title 24 Compliance Report to the local building permit review authority and the California Energy Commission (CEC). The 2019 Title 24 standards are the applicable building energy efficiency standards for the project because they became effective on January 1, 2020 (2018).

Part 11 – California Green Building Standards

The California Green Building Standards Code, referred to as CalGreen, was added to Title 24 as Part 11, first in 2009 as a voluntary code, which then became mandatory effective January 1, 2011 (as part of the 2010 California Building Standards Code). Current CalGreen includes mandatory minimum environmental performance standards for all ground-up new construction of residential and non-residential structures. It also includes voluntary tiers (Tiers I and II) with stricter environmental performance standards for these same categories of residential and non-residential buildings. Local jurisdictions must enforce the minimum mandatory CalGreen standards and may adopt additional amendments for stricter requirements.

The mandatory standards require:

- 20 percent reduction in indoor water use relative to specified baseline levels;²
- 65 percent construction/demolition waste diverted from landfills;
- Inspections of energy systems to ensure optimal working efficiency;
- Low-pollutant emitting exterior and interior finish materials such as paints, carpets, vinyl flooring, and particleboards;
- Dedicated circuitry to facilitate installation of electric vehicle charging stations in newly constructed attached garages for single-family and duplex dwellings; and
- Installation of electric vehicle charging stations at least three percent of the parking spaces for all new multi-family developments with 17 or more units.

The voluntary standards require:

- Tier I: stricter energy efficiency requirements, stricter water conservation requirements for specific fixtures, 65 percent reduction in construction waste with third-party verification, 10 percent recycled content for building materials, 20 percent permeable paving, 20 percent cement reduction, and cool/solar reflective roof; and
- Tier II: stricter energy efficiency requirements, stricter water conservation requirements for specific fixtures, 75 percent reduction in construction waste with third-party verification, 15 percent recycled content for building materials, 30 percent permeable paving, 25 percent cement reduction, and cool/solar reflective roof.

c. Regional and Local Regulations

Mendocino County Air Quality Management District

The Mendocino County Air Quality Management District (MCAQMD) is responsible for assuring that the federal and state ambient air quality standards are attained and maintained in the southern North Coast Air Basin. MCAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, conducting public education campaigns, and many other activities.

Mendocino Council of Governments

The 2017 Mendocino RTP is a long-range planning effort, undertaken by MCOG, that involves federal, State, regional, local and tribal governments; public and private organizations; and individuals working together to plan how future regional transportation needs can be met. The RTP Guidelines require that the issue of climate change and greenhouse gas emissions be addressed during the RTP process. While predominately rural areas such as Mendocino County are not subject to the same requirements as urban regions, discussion of the issue in the RTP provides the opportunity to identify existing and future efforts that will contribute to the emission reduction targets. Strategies to reduce GHG generation entail expanded transit use, improving streets/roads

² Similar to the compliance reporting procedure for demonstrating Energy Code compliance in new buildings and major renovations, compliance with the CalGreen water-reduction requirements must be demonstrated through completion of water use reporting forms. Buildings must demonstrate a 20 percent reduction in indoor water use by either showing a 20 percent reduction in the overall baseline water use as identified in CalGreen or a reduced per-plumbing-fixture water use rate.

efficiency, and expanding non-motorized travel opportunities. These strategies have been and will continue to be employed in Mendocino County throughout the time frame of the 2017 RTP, which is 2017 to 2030. The RTP includes the objective to “invest in transportation projects and participate in regional planning efforts that will help Mendocino County residents to proportionately contribute to the California greenhouse gas reduction targets established by Assembly Bill 32 and SB 375” (MCOG 2018). Policies to support that objective include the following:

- Evaluate transportation projects based on their ability to reduce Mendocino County’s transportation-related greenhouse gas emissions.
- Prioritize transportation projects which lead to reduced greenhouse gas emissions.
- Monitor new technologies and opportunities to implement energy efficient and nonpolluting transportation infrastructure.
- Continue to consider bicycle transportation, pedestrian, and transit projects for funding in the State Transportation Improvement program.
- Continue administrative, planning, and funding support for the Region’s transit agency, Mendocino Transit Authority.
- Encourage private and public investment in a countywide electric vehicle charging station network and seek funding to fill gaps in the network.

City of Ukiah Climate Action Plan

The City of Ukiah Draft 2014 Climate Action Plan (CAP) outlines strategies, goals, and actions for reducing municipal and community-wide GHG emissions. The Draft CAP was completed in 2014 but never adopted by the City. The CAP is designed to ensure that Ukiah does its part to contribute to the goals of AB 32, while remaining consistent with the Ukiah General Plan vision for future growth. The CAP includes emissions reduction goals, strategies, and actions for 2020 and considers the years beyond 2020 as deeper reductions in GHG emissions are necessary. The measures in the CAP address energy consumption and generation, transportation and land use, solid waste disposal, and water use.

4.6.3 Impact Analysis

Significance Thresholds

Based on Appendix G of the *CEQA Guidelines*, impacts related to GHG emissions from the proposed project would be significant if the project would:

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

Most individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence on climate change. However, physical changes caused by a project can contribute incrementally to cumulative effects that are significant, even if individual changes resulting from a project are limited. The issue of climate change typically involves an analysis of whether a project’s contribution towards an impact is cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future

projects (*CEQA Guidelines*, Section 15064[h][1]). MCAQMD defers to Bay Area Air Quality Management District (BAAQMD) guidelines for projects in Mendocino County (MCAQMD 2013). The 2022 BAAQMD *CEQA Air Quality Guidelines* provides two plan level thresholds for determining the significance of GHGs. The two approaches are as follows:

1. Consistency with a qualified GHG reduction plan
2. Meets the State’s goals to reduce emissions to 40 percent below 1990 levels by 2030 and carbon neutrality by 2045

The City of Ukiah’s CAP is not a qualified GHG reduction plan, since it contains targets only for 2020 and was never adopted by the City; therefore, the first approach is not feasible. As such, the City uses the second approach to determine the significance of GHGs for development facilitated by Ukiah 2040.

Methodology

The focus of this analysis of GHG emissions are limited to only those potential emissions that would result from net buildout of the project. While emissions generated in the City and the region, such as those emissions generated by businesses or individual operations, may contribute to GHG emissions globally, only those emissions that may change compared to existing conditions under project implementation are included in this EIR. Emissions not directly resulting from development facilitated by the project are considered outside the scope of this CEQA analysis because it would be speculative to analyze impacts not directly related to the project.

Based on plan-level guidance from the 2022 BAAQMD *CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans*, GHG emissions associated with project implementation is discussed qualitatively by comparing Ukiah 2040 to the 2022 BAAQMD GHG thresholds, namely whether policies work towards carbon neutrality by 2045. In addition, the plans are qualitatively compared to other applicable plans, policies, and regulations adopted for the purpose of reducing the emissions of GHGs.

Threshold 1: Would the project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?
Threshold 2: Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Impact GHG-1 DEVELOPMENT FACILITATED BY UKIAH 2040 WOULD MAKE PROGRESS TOWARDS ACHIEVING STATE GOALS BUT WOULD NOT NECESSARILY MEET STATE 2030 OR 2045 GOALS. MITIGATION MEASURES GHG-1 AND GHG-2 WOULD RESULT IN IMPLEMENTATION OF CEQA GHG THRESHOLDS AND A CAP UPDATE; HOWEVER, DEVELOPMENT FACILITATED BY UKIAH 2040 WOULD NOT MEET THE 2030 OR 2045 GOALS UNTIL THE CAP IS UPDATED AND ADOPTED. THIS IMPACT WOULD BE SIGNIFICANT AND UNAVOIDABLE.

Construction Emissions

Development facilitated by Ukiah 2040 would result in GHG emissions during construction, primarily from fuel consumption associated with heavy equipment, light-duty vehicles, machinery, and generators for lighting. Temporary grid power may also be provided to construction trailers or electric construction equipment that may result in indirect GHG emissions from the energy generation. Development facilitated by Ukiah 2040 would utilize construction contractors that would be required to comply with applicable CARB regulations such as accelerated retrofitting,

repowering, or replacement of heavy-duty diesel on-road and off-road equipment. Construction contractors are required to comply with the provisions of CCR Title 13, sections 2449 and 2485, and CARB regulations prohibiting diesel-fueled commercial and off-road vehicles from idling for more than five minutes, minimizing unnecessary GHG emissions. Construction equipment would be subject to the USEPA Construction Equipment Fuel Efficiency Standard, which would minimize inefficient fuel consumption and thus GHG emissions. These construction equipment standards (i.e., Tier 4 efficiency requirements) are contained in 40 Code of Federal Regulations Parts 1039, 1065, and 1068. Pursuant to applicable regulatory requirements of CALGreen, development facilitated by the 2040 General Plan would comply with construction waste management practices to divert construction and demolition debris from landfills. These practices would result in efficient use of energy by construction facilitated by the project and therefore would minimize unnecessary GHG emissions. Furthermore, in the interest of cost efficiency, construction contractors would not utilize fuel in a manner that is wasteful or unnecessary, which would also have the effect of minimizing GHG emissions.

Pursuant to the 2022 BAAQMD *CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans*, BAAQMD does not recommend a construction-related climate impact threshold. According to BAAQMD, GHG emissions from construction represent a very small portion of a project's lifetime GHG emissions. The proposed thresholds for land use projects are designed to address operational GHG emissions that represent the vast majority of project GHG emissions. Therefore, the evaluation of GHG emissions impacts associated with project implementation is focused on operational emissions, discussed below.

Nonetheless, the Ukiah 2040 Environment and Sustainability Element includes policies to reduce the impact of GHG emissions generated with construction activities. The relevant policies include the following:

Policy ENV-7.3: Implement Clean Air Plan. The City shall cooperate with Mendocino County Air Quality Management District (MCAQMD) to implement the Clean Air Plan required by the Clean Air Act, reduce non-attainment pollutants, including PM₁₀, PM_{2.5}, and ozone, and enforce air quality standards as required by State and Federal statutes.

Policy ENV-7.5: Construction and Operations. The City shall require that development projects incorporate feasible measures that reduce construction and operational emissions for reactive organic gases, nitrogen oxides, and particulate matter (PM₁₀ and PM_{2.5}).

Implementation of Policy ENV-7.3 does not directly address construction GHG emissions, but implementation of a Clean Air Plan and subsequent reduction of significant air quality impacts from construction would reduce construction GHG emissions. Policy ENV-7.5 would reduce construction GHG emissions since measures to reduce reactive organic gases, nitrogen oxides, and particulate matter would indirectly reduce construction GHG emissions. Measures to reduce air quality impacts from construction activities could include using equipment equipped with a cleaner engine, using alternative powered equipment (e.g., electric equipment), or reducing the hours equipment can operate on site. These factors would reduce both air quality and GHG construction emissions.

Operational Emissions

Development facilitated by Ukiah 2040 would result in GHG emissions during operation. GHG emissions would result primarily from building energy usage and fuel consumption associated with light-duty vehicles. Ukiah 2040 contains policies that aim to reduce operational GHG emissions in accordance with State 2030 GHG emissions reductions goals and provide substantial progress to the

State's goal of carbon neutrality by 2045. Proposed Ukiah 2040 policies related to GHG emissions reductions include:

Goal ENV-7: To improve air quality to the benefit of public health, welfare, and reduce air quality impacts with adverse effects on residents' health and wellbeing.

Policy ENV-7.1: Transit Oriented Development. The City shall concentrate new development near areas served by transit access and reduce single-occupancy vehicle dependency.

Policy ENV-7.2: Active Transportation. The City shall prioritize pedestrian and bicycle access, infrastructure, and education to encourage increased use of alternative modes of transportation as a means to reduce direct and indirect air contaminant emissions.

Policy ENV-7.5: Construction and Operations. The City shall require that development projects incorporate feasible measures that reduce construction and operational emissions for reactive organic gases, nitrogen oxides, and particulate matter (PM₁₀ and PM_{2.5}).

Policy ENV-7.6: Wood Burning Fireplace Replacement. The City shall promote the replacement of non-EPA certified fireplaces and woodstoves and encourage city residents to participate in MCAQMD and NSCAPCD programs, such as the Wood Stove Rebate Program.

Policy ENV-7.7: City Vehicle and Equipment Fleet. The City shall continue to purchase low-emission vehicles and use clean alternative fuels as part of their fleet. When possible, the City will replace gas and hybrid vehicles with electric vehicles.

Policy ENV-7.8: Residential EV Charging Stations. The City shall encourage new development to install EV charging stations in homes to increase the potential for the public to use zero-emission vehicles, lessening the impacts to air quality through pollution.

Policy ENV-7.9: Public EV Charging Stations. The City shall install public charging stations in its commercial areas to provide additional charging options for city visitors.

Goal ENV-8: To achieve carbon neutrality by or before the year 2045.

Policy ENV-8.1: Carbon Neutrality Resolution. The City shall adopt a Carbon Neutrality Resolution that provides a foundation for all subsequent climate actions.

Policy ENV-8.2: Micro-grid and Small Battery Storage. The City shall encourage the development of small-scale battery storage and micro grid capacity for storing renewable power for nighttime energy use.

Policy ENV-8.3: Municipal Building Electrification Plan. The City shall adopt an electrification plan for all municipal buildings to convert them to all electric using energy from carbon-free and renewable sources by 2035.

Policy ENV-8.4: Municipal Preference of Emissions-Reduced Equipment. The City shall contract only with providers who use electric-powered equipment where available and feasible for City construction projects or contract services.

Policy ENV-8.5: Energy Conservation and Renewable Energy. The City shall promote energy conservation in municipal facilities by seeking opportunities to install energy efficient fixtures and appliances, solar panels, solar battery storage, and other retrofits to new and existing structures.

Goal LU-1: To provide a variety of housing types that offer choices for Ukiah residents and create complete, livable neighborhoods.

Policy LU-1.2: Connectivity. The City shall encourage new residential development to incorporate design features that promote walking and connectivity between blocks.

Policy LU-1.4: High-Density Residential Uses. The City shall encourage new high-density residential development to locate in areas close to services and transit.

Goal LU-2: To encourage mixed-use development projects that create vibrant, walkable districts.

Policy LU-2.1: Downtown Mixed-Use. The City shall encourage mixed-use development to locate within the Downtown. Such developments include housing, retail commercial, offices, open space, and other compatible uses. This development pattern should create vibrant, walkable areas, in contrast to strip retail developments along corridors.

Policy LU-2.3: Mixed-Use Design. The City shall require new mixed-use development to limit the number of access driveways, minimize building setbacks, and provide public ground floor spaces adjacent to sidewalks.

Policy LU-2.4: Pedestrian Orientation. The City shall require new mixed-use and commercial developments with street or bike route frontage to include amenities that connect and create a comfortable environment for walking, sitting, and socializing.

Policy LU-2.5: Live/Work. The City shall encourage mixed-uses in appropriate non-residential or existing mixed-use areas, facilitate the adaptive reuse of otherwise obsolete structures, and promote the growth of the arts and small business ventures in the community by allowing combined workspace and living quarters in appropriate buildings in commercial or industrial zoning districts.

Goal LU-4: To encourage the growth and development of retail, office, service, and entertainment uses in Ukiah to provide jobs, support City services, and make Ukiah an attractive place to live.

Policy LU-4.5: Pedestrian Access to Commercial Uses. The City shall support convenient and direct pedestrian access to commercial uses that are located adjacent to residential areas.

Goal MOB-1: To provide a citywide network of complete streets that meet the needs of all users, including pedestrians, bicyclists, motorists, transit, movers of commercial goods, children, seniors, and persons with disabilities.

Policy MOB-1.1: Complete Streets. The City shall design streets holistically, using a complete streets approach, which considers pedestrians, bicyclists, motorists, transit users, and other modes together to adequately serve future land uses.

Policy MOB-1.2: Multi-modal Access. The City shall require that all new development and redevelopment projects include provisions for multi-modal access provisions such as pedestrian and bicycle facilities, and vehicle and transit where relevant.

Policy MOB-1.3: Reallocate Space for Complete Streets. The City shall reallocate roadway space to allow complete streets improvements on streets with excess traffic capacity.

Policy MOB-1.4: Block Length. The City shall limit block lengths to 600 feet wherever feasible to enhance multi-modal circulation and connectivity.

Policy MOB-1.8: New Development and Complete Streets. The City shall require all new development to provide adequate access for pedestrians, bicyclists, motorists, transit users, and persons with disabilities, as well as facilities necessary to support the City’s goal of maintaining a complete street network.

Policy MOB-1.9: Bikeway Network. The City shall strive to complete the citywide bicycle network to create a full network of bicycle facilities throughout Ukiah, including bicycle lanes on all arterial and collector street segments where feasible.

Policy MOB-1.10: Bicycle Parking Standards. The City shall maintain efficient and updated parking standards for bicycle parking to ensure development provides adequate bicycle parking, while reducing reliance on automobiles.

Policy MOB-1.11: Pedestrian Barriers & Utility Relocation. The City shall support elimination of barriers to pedestrian travel on sidewalks and walking paths including requiring the relocation or undergrounding of utilities where appropriate.

Goal MOB-2: To reduce vehicle miles traveled (VMT) to and from residences, jobs and commercial uses in Ukiah.

Policy MOB-2.1: Vehicle Miles Traveled (VMT) Reduction. The City shall support development and transportation improvements that help reduce VMT below regional averages on a “residential per capita” and “per employee” basis.

Policy MOB-2.2: Transportation Demand Management. The City shall support programs to reduce vehicle trips, including measures such as reduced parking requirements that aim to increase transit use, car-pooling, bicycling and walking.

Policy MOB-2.3: Pedestrian Facilities. The City shall encourage new development and redevelopment that increases connectivity through direct and safe pedestrian connections to public amenities, neighborhoods, shopping and employment destinations throughout the City.

Policy MOB-2.4: Transit Facility Design. The City shall require new development to include facilities designed to make public transportation convenient.

Policy MOB-2.5: Transit Ridership. The City shall support funding and incentives to increase transit ridership opportunities.

Policy MOB-2.6: Downtown Transit Center. The City shall support creation of a Transit Center.

Policy MOB-2.7: Bicycle Accessible Transit. The City shall encourage the MTA and other public transportation providers to make bus routes connecting Ukiah with other areas bicycle accessible.

Goal MOB-5: To promote a balance of multi-modal options, to be reflected in flexible parking regulations.

Policy MOB-5.1: Incentives for Travel Alternatives. The City shall work with downtown businesses and employers reduce the need for and expenses of off-street parking by supporting and encouraging alternatives to single-occupant vehicles such as incentives and priority parking for carpools and vanpools, secure bicycle parking, and free bus passes.

Policy MOB-5.2: Support for Charging Stations. The City shall support the provision of charging stations for electric vehicles, as well as other types of vehicles, as new technologies emerge.

Ukiah 2040 proposed goals and policies would assist in reducing emissions to 40 percent below 1990 levels by 2030 and reaching carbon neutrality by 2045, but as explained further below would not necessarily achieve either goal. Goal ENV-7 and associated policies would reduce air quality pollutants, which would also reduce GHG emissions through encouragement of transit use and active transportation, measures to reduce construction and operational emissions, replacement of wood burning fireplaces, and electric vehicle uses. Goal ENV-8 and associated policies directly aims to achieve carbon neutrality by 2045. Specifically, Policy ENV-8.1 calls for the adoption of a Carbon Neutrality Resolution to guide future CAPs. Policies ENV-8.2 through ENV-8.5 encourage use of electric-powered equipment, energy conservation, and renewable energy use, which would reduce GHG emissions associated with non-renewable energy sources. Goals LU-1 and LU-2 and associated policies call for land use to be designed to accommodate pedestrian use, which would reduce reliance on personal vehicles and subsequent GHG emissions. Goals MOB-1, MOB-2, and MOB-5, along with associated policies aim to increase transit ridership and active transportation use, while reducing vehicle miles traveled, which would reduce GHG emissions associated with personal vehicles.

Ukiah 2040 is a policy-level document that guides land use and development throughout the City. The CARB 2017 Climate Change Scoping Plan outlines a pathway to achieving the 2030 reduction targets set under SB 32, which are considered interim targets toward meeting the long-term 2045 carbon neutrality goal established by California Executive Order B-55-18. While Ukiah 2040 would facilitate additional development within the City, building energy consumption and VMT (and thus GHG emissions), water consumption, and solid waste generation per capita would be reduced under the project's buildout compared to existing conditions, given the above discussed policies. However, Ukiah 2040 does not outline how the City would meet the goals to reduce emissions to 40 percent below 1990 levels by 2030 and carbon neutrality by 2045. Ukiah 2040 would therefore not be consistent with the California Executive Order B-55-18 goal of carbon neutrality by 2045, nor does it have a qualified GHG reduction plan to guide progress towards State goals. Therefore, impacts related to generation of GHG emissions and consistency with State GHG reduction plans due to Ukiah 2040 would be potentially significant.

Implementation of Mitigation Measures GHG-1 and GHG-2 would require that the City implement CEQA GHG emissions thresholds and update the Ukiah CAP to establish a Citywide GHG reduction target and provide an outline of how Ukiah will meet the State goal of carbon neutrality by 2045.

Mitigation Measures

GHG-1 Adopt and Implement a CEQA GHG Emissions Threshold

The City shall include and implement a new 2040 General Plan policy under the Environment and Sustainability Element to prepare, adopt, and implement a CEQA GHG Emissions threshold of significance. The City shall adopt the CEQA GHG Emissions threshold of significance by Fall 2024 for use in future CEQA GHG emissions analyses through 2030. In addition, upon completion of future CAP updates and as necessary, the City shall update the CEQA GHG Emissions threshold of significance and Ukiah CEQA GHG Checklist to be consistent with each CAP update.

GHG-2 Update Ukiah CAP to the State's 2030 and 2045 GHG Emissions Goals

The City shall update the Ukiah CAP by Fall 2024 to outline how Ukiah will meet the State's 2030 goal of 40 percent below 1990 emissions levels and 2045 goal of carbon neutrality. Implementation

measures in the updated CAP to achieve the 2030 and 2045 goals may include, but are not limited to, the following:

- Develop and adopt Zero Net Energy requirements for new and remodeled residential and non-residential development;
- Develop and adopt a building electrification ordinance for existing and proposed structures;
- Expand charging infrastructure and parking for electric vehicles;
- Implement carbon sequestration by expanding the urban forest, participating in soil-based or compost application sequestration initiatives, supporting regional open space protection, and/or incentivizing rooftop gardens; and
- Implement policies and measures included in the California 2017 Climate Change Scoping Plan, such as mobile source strategies for increasing clean transit options and zero emissions vehicles by providing electric vehicle charging stations.

Significance After Mitigation

Implementation of Mitigation Measures GHG-1 and GHG-2 would ensure that development facilitated by Ukiah 2040 after Fall 2024 would be consistent with State emissions goals. However, individual projects that may occur prior to Fall 2024 would not be guaranteed to be consistent with State emissions goals, nor are exact emissions reductions known at the time of adoption of the 2040 General Plan. Until the CEQA GHG thresholds are adopted and the CAP is updated, implementation of Ukiah 2040 would not be consistent with BAAQMD GHG thresholds nor would it be consistent with State GHG reduction plans. Therefore, the project's impacts related to GHG emissions would be significant and unavoidable.