3.6 - Greenhouse Gas Emissions and Energy

3.6.1 - Introduction

This section describes the existing greenhouse gas (GHG) emissions setting and potential effects from project implementation on the project site and its surrounding area. Descriptions and analysis in this section are based on modeling information and assumptions presented in Section 3.2, Air Quality. The modeling outputs and calculations specific to this Greenhouse Gas Analysis are included in Appendix B of this Draft Environmental Impact Report (Draft EIR). The following comments were received in response to the Notice of Preparation (NOP) related to GHG emissions:

- The EIR should assess and mitigate the impacts of the project on climate change causing GHG emissions.

3.6.2 - Environmental Setting

Greenhouse Effect, Global Warming, and Climate Change

Most of the energy that affects the Earth's climate comes from the sun. Some solar radiation is absorbed by the Earth's surface, and a smaller portion of this radiation is reflected by the atmosphere back toward space. As the Earth absorbs high-frequency solar radiation, its surface gains heat and then re-radiates lower frequency infrared radiation back into the atmosphere.[1]

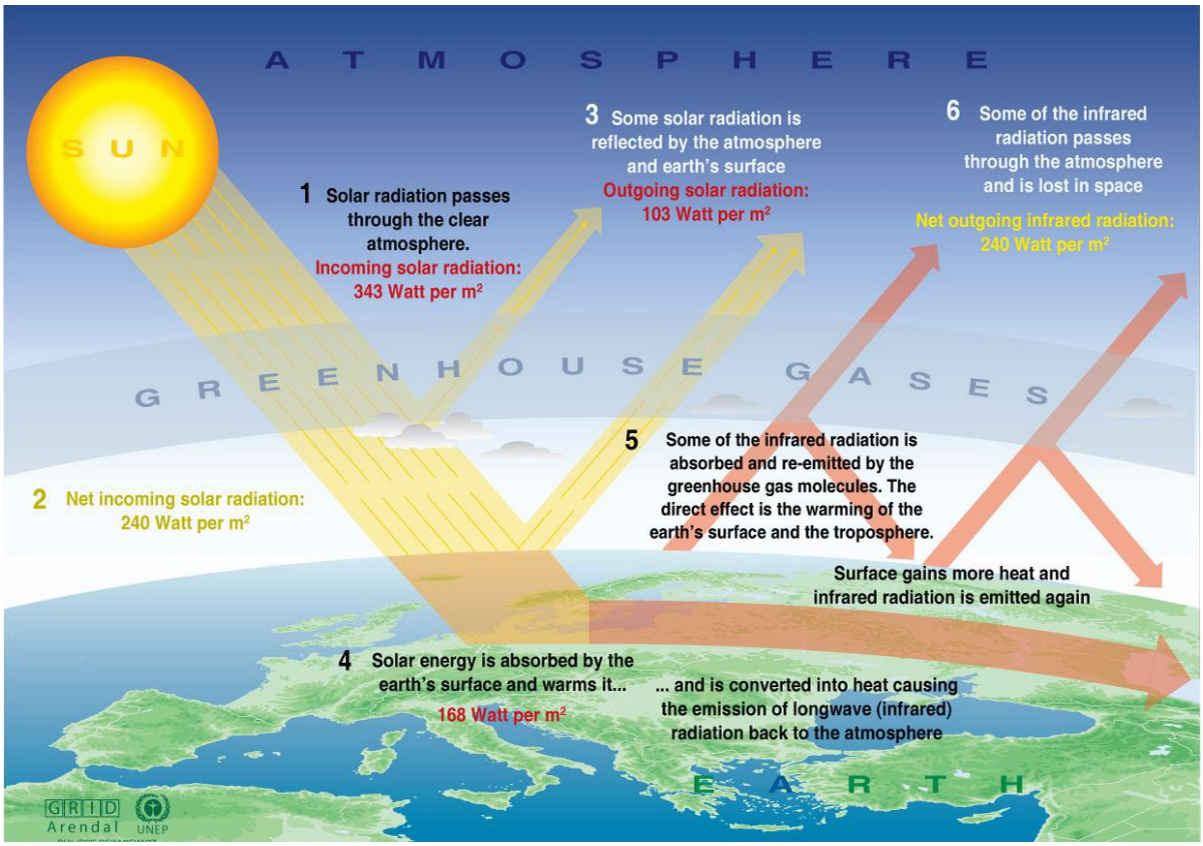
Most solar radiation passes through gases in the atmosphere classified as GHGs; however, infrared radiation is selectively absorbed by GHGs. GHGs in the atmosphere play a critical role in maintaining the balance between the Earth's absorbed and radiated energy, the Earth's radiation budget,[2] by trapping some of the infrared radiation emitted from the Earth's surface that otherwise would have escaped to space (Figure 3.6-1). Radiative forcing is the difference between the incoming energy and outgoing energy.[3] Specifically, GHGs affect the atmosphere's radiative forcing,[4] which in turn affects the Earth's average surface temperature. This phenomenon, the *greenhouse effect*, keeps the Earth's atmosphere near the surface warmer than it would be otherwise and allows successful habitation by humans and other forms of life.

Combustion of fossil fuels and deforestation release carbon into the atmosphere that historically has been stored underground in sediments or in surface vegetation, thus exchanging carbon from the geosphere and biosphere to the atmosphere in the carbon cycle. With the accelerated increase in fossil fuel combustion and deforestation since the Industrial Revolution of the 19th Century, concentrations of GHGs in the atmosphere have increased exponentially. Such emissions of GHGs in excess of natural ambient concentrations contribute to the enhancement of the natural greenhouse effect. This enhanced greenhouse effect has contributed to *global warming*, an increased rate of

[1] Frequencies at which bodies emit radiation are proportional to temperature. The Earth has a much lower temperature than the sun and emits radiation at a lower frequency (longer wavelength) than the high-frequency (short-wavelength) solar radiation emitted by the sun.
[2] This includes all gains of incoming energy and all losses of outgoing energy; the planet is always striving to be in equilibrium.
[3] Positive forcing tends to warm the surface while negative forcing tends to cool it.
[4] This is the change in net irradiance at the tropopause after allowing stratospheric temperatures to readjust to radiative equilibrium, but with surface and tropospheric temperatures and state held fixed at the unperturbed values.

warming of the Earth's average surface temperature.[5] Specifically, increases in GHGs lead to increased absorption of infrared radiation by the Earth's atmosphere and warm the lower atmosphere further, thereby increasing temperatures and evaporation rates near the surface.

Variations in natural phenomena such as volcanoes and solar activity produced most of the global temperature increase that occurred during preindustrial times; more recently, however, increasing atmospheric GHG concentrations resulting from human activity have been responsible for most of the observed global temperature increase.[6]



Source: Philippe Rekacewicz, UNEP/GRID-Arendal. Website: https://www.grida.no/resources/6467. Accessed on April 26, 2019.

Figure 3.6-1: The Greenhouse Effect

Global warming affects global atmospheric circulation and temperatures; oceanic circulation and temperatures; wind and weather patterns; average sea level; ocean acidification; chemical reaction rates; precipitation rates, timing, and form; snowmelt timing and runoff flow; water supply; wildfire risks; and other phenomena, in a manner commonly referred to as *climate change*. Climate change is a change in the average weather of the Earth that is measured by alterations in wind patterns, storms, precipitation, and temperature. These changes are assessed using historical records of

[5] This condition results when the Earth has to work harder to maintain its radiation budget, because when more GHGs are present in the atmosphere, the Earth must force emissions of additional infrared radiation out into the atmosphere.

[6] These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

temperature changes occurring in the past, such as during previous ice ages. Many of the concerns regarding climate change use this data to extrapolate a level of statistical significance specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

Temperature Predictions by the Intergovernmental Panel on Climate Change

The United Nations Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to understanding climate change, its potential impacts, and options for adaptation and mitigation. The IPCC constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. In its Sixth Assessment Report, the IPCC predicted that the global mean temperature change from 2015 to 2100, given five scenarios, could range from 1.4°C (degrees Celsius) to 4.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios.[7] The report also concluded that "[i]t is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred." Warming of the climate system is now considered to be unequivocal,[8] with the likely range of total human-caused global surface temperature increases from approximately 0.8°C to 1.3°C since 1850.[9]

Greenhouse Gases and Global Emission Sources

Gases that trap heat in the atmosphere are referred to as GHGs. The effect is analogous to the way a greenhouse retains heat. Prominent GHGs that naturally occur in the Earth's atmosphere are water vapor, carbon dioxide (CO_2), methane (CH_4), oxides of nitrogen (NO_X), and ozone. Anthropogenic (human-caused) GHG emissions include releases of these GHGs plus release of human-made gases with high global warming potential (GWP) (ozone-depleting substances such as chlorofluorocarbons (CFCs)[10] and aerosols, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). The GHGs listed by the IPCC (CO_2, methane, nitrous oxide, HFCs, PFCs, and sulfur hexafluoride) are discussed below, in order of abundance in the atmosphere. Water vapor, despite being the most abundant GHG, is not discussed below because natural concentrations and fluctuations far outweigh anthropogenic influences, making it impossible to predict. Ozone is not included because it does not directly affect radiative forcing. Ozone-depleting substances, which include chlorofluorocarbons, halons, carbon tetrachloride, methyl chloroform, and hydrochlorofluorocarbons, are not included because they have been primarily replaced by HFCs and PFCs.

The GWP is the potential of a gas or aerosol to trap heat in the atmosphere. The GWP of a gas is essentially a measurement of the radiative forcing of a GHG compared with the reference gas, carbon dioxide (CO_2).

[7] United Nations Intergovernmental Panel on Climate Change (IPCC). 2021. Climate Change 2021: The Physical Science Basis Summary for Policymakers. Website: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM_final.pdf. Accessed December 15, 2021.

[8] Ibid.

[9] Ibid.

[10] CFCs destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited CFCs production in 1987.

Individual GHG compounds have varying potential for contributing to global warming. For example, methane is 25 times as potent as CO_2, while sulfur hexafluoride is 22,200 times more potent than CO_2 on a molecule-per-molecule basis. To simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method for comparing GHG emissions is the GWP methodology defined in the IPCC reference documents (IPCC, 2001a). The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalents (CO_2e), which compares the gas in question to that of the same mass of CO_2 (by definition, CO_2 has a GWP of 1). The GWP of a GHG is a measure of how much a given mass of a GHG is estimated to contribute to global warming. Thus, to describe how much global warming a given type and amount of GHG may cause, the CO_2e is used. A CO_2e is the mass emissions of an individual GHG multiplied by its GWP. As such, a high GWP represents high absorption of infrared radiation and a long atmospheric lifetime compared to CO_2. One must also select a time horizon to convert GHG emissions to equivalent CO_2 emissions to account for chemical reactivity and lifetime differences among various GHG species. The standard time horizon for climate change analysis is 100 years. Generally, GHG emissions are quantified in terms of metric tons (MT) of CO_2e (MT CO_2e) emitted per year.

The atmospheric residence time of a gas is equal to the total atmospheric abundance of the gas divided by its rate of removal.[11] The atmospheric residence time of a gas is, in effect, a half-life measurement of the length of time a gas is expected to persist in the atmosphere when accounting for removal mechanisms such as chemical transformation and deposition.

Table 3.6-1 lists the GWP of each GHG and its lifetime. Units commonly used to describe the concentration of GHGs in the atmosphere are parts per million (ppm), parts per billion (ppb), and parts per trillion (ppt), referring to the number of molecules of the GHG in a sampling of 1 million, 1 billion, or 1 trillion molecules of air. Collectively, HFCs, PFCs, and sulfur hexafluoride are referred to as high GWP gases. CO_2 is by far the largest component of worldwide CO_2e emissions, followed by methane, nitrous oxide, and high GWP gases, in order of decreasing contribution to CO_2e.

The primary human processes that release GHGs include the burning of fossil fuels for transportation, heating, and electricity generation; agricultural practices that release methane, such as livestock grazing and crop residue decomposition; and industrial processes that release smaller amounts of high GWP gases. Deforestation and land cover conversion have also been identified as contributing to global warming by reducing the Earth's capacity to remove CO_2 from the air and altering the Earth's albedo or surface reflectance, thus allowing more solar radiation to be absorbed. Specifically, CO_2 emissions associated with fossil fuel combustion are the primary contributors to human-induced climate change. CO_2, methane, and nitrous oxide emissions associated with human activities are the next largest contributors to climate change.

GHGs of California concern are defined by California Assembly Bill (AB) 32 (see the Regulatory Environment subsection below for a description) and include CO_2, CH_4, NO_X, HFCs, PFCs, and SF_6. A seventh GHG, nitrogen trifluoride (NF_3), was also added under the California Health and Safety Code

[11] Seinfeld, J.H. and S.N. Pandis. 2006. Atmospheric Chemistry and Physics: From Air Pollution to Climate Change, 2nd Edition. New York. John Wiley & Sons.

Section 38505(g)(7) as a GHG of concern. These GHGs are described in Table 3.6-1 in terms of their physical description and properties, GWP, atmospheric residence lifetime, sources, and atmospheric concentration in 2005.

Table 3.6-1: Description of Greenhouse Gases of California Concern

Greenhouse Gas	Physical Description and Properties	Global Warming Potential (100 years)	Atmospheric Residence Lifetime (years)	Sources
Carbon dioxide (CO_2)	Odorless, colorless, natural gas.	1	50-200	burning coal, oil, natural gas, and wood; decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; oceanic evaporation; volcanic outgassing; cement production; land use changes
Methane (CH_4)	Flammable gas and is the main component of natural gas.	25	12	geological deposits (natural gas fields) extraction; landfills; fermentation of manure; and decay of organic matter
Nitrous oxide (N_2O)	Nitrous oxide (laughing gas) is a colorless GHG.	298	114	microbial processes in soil and water; fuel combustion; industrial processes
Chloro-fluoro-carbons (CFCs)	Nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (level of air at the Earth's surface); formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms.	3,800-8,100	45-640	refrigerants aerosol propellants; cleaning solvents
Hydro-fluoro-carbons (HFCs)	Synthetic human-made chemicals used as a substitute for CFCs and contain carbon, chlorine, and at least one hydrogen atom.	140 to 11,700	1-50,000	automobile air conditioners; refrigerants
Per-fluoro-carbons (PFCs)	Stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface.	6,500 to 9,200	10,000-50,000	primary aluminum production; semiconductor manufacturing

Greenhouse Gas	Physical Description and Properties	Global Warming Potential (100 years)	Atmospheric Residence Lifetime (years)	Sources
Sulfur hexafluoride (SF_6)	Human-made, inorganic, odorless, colorless, and nontoxic, nonflammable gas.	22,800	3,200	electrical power transmission equipment insulation; magnesium industry, semiconductor manufacturing; a tracer gas
Nitrogen trifluoride (NF_3)	Inorganic, is used as a replacement for PFCs, and is a powerful oxidizing agent.	17,200	740	electronics manufacture for semiconductors and liquid crystal displays

Sources:
United Nations Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller [eds.]). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, Website: www.ipcc.ch /publications_and_data/ar4/wg1/en/contents.html. Accessed July 20, 2021.

United Nations Intergovernmental Panel on Climate Change (IPCC). 2014. Climate Change 2007: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Core Writing Team, Pachauri, R.K. and Reisinger, A. [eds.]). IPCC, Geneva, Switzerland. Website: www.ipcc.ch/publications_ and_data/ar4/syr/en/contents.html. Accessed July 20, 2021.

The State has begun the process of addressing pollutants referred to as short-lived climate pollutants. Senate Bill (SB) 605, approved by the Governor on September 14, 2014, required the California Air Resources Board (ARB) to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants by January 1, 2016. The ARB released the Proposed Short-Lived Climate Pollutant Reduction Strategy in April 2016. The ARB has completed an emission inventory of these pollutants, identified research needs, identified existing and potential new control measures that offer co-benefits, and coordinated with other State agencies and districts to develop measures.

The short-lived climate pollutants include three main components: black carbon, fluorinated gases, and methane. Fluorinated gases and methane are described in Table 3.6-1 and are already included in the California GHG inventory. Black carbon has not been included in past GHG inventories; however, the ARB will include it in its comprehensive strategy.[12]

Black carbon is a component of fine particulate matter. Black carbon is formed by incomplete combustion of fossil fuels, biofuels, and biomass. Sources of black carbon within a jurisdiction may include exhaust from diesel trucks, vehicles, and equipment, as well as smoke from biogenic combustion. Biogenic combustion sources of black carbon include the burning of biofuels used for transportation, the burning of biomass for electricity generation and heating, prescribed burning of agricultural residue, and natural and unnatural wildfires. Black carbon is not a gas but an aerosol—particles or liquid droplets suspended in air. Black carbon only remains in the atmosphere for days to

[12] California Air Resources Board (ARB). 2015. Short-Lived Climate Pollutant Reduction Strategy, Concept Paper. May. Website: https://ww2.arb.ca.gov/resources/documents/slcp-strategy-draft-may2015. Accessed May 19, 2021

weeks, whereas other GHGs can remain in the atmosphere for years. Black carbon can be deposited on snow, where it absorbs sunlight, reduces sunlight reflectivity, and hastens snowmelt. Direct effects include absorbing incoming and outgoing radiation; indirectly, black carbon can also affect cloud reflectivity, precipitation, and surface dimming (cooling).

GWPs for black carbon were not defined by the IPCC in its Fourth Assessment Report. The ARB has identified a GWP of 3,200 using a 20-year time horizon and 900 using a 100-year time horizon from the IPCC Fifth Assessment. Sources of black carbon are already regulated by the ARB, and air district criteria pollutant and toxic regulations that control fine particulate emissions from diesel engines and other combustion sources.[13] Additional controls on the sources of black carbon specifically for their GHG impacts beyond those required for toxic and fine particulates are not likely to be needed.

Ozone is another short-lived climate pollutant that will be part of the strategy. Ozone affects evaporation rates, cloud formation, and precipitation levels. Ozone is not directly emitted, so its precursor emissions, volatile organic compounds (VOC) and oxides of nitrogen (NO_X) on a regional scale and CH_4 on a hemispheric scale will be subject of the strategy.[14]

Water vapor is also considered a GHG. Water vapor is an important component of our climate system and is not regulated. Increasing water vapor leads to warmer temperatures, which causes more water vapor to be absorbed into the air. Warming and water absorption increase in a spiraling cycle. Water vapor feedback can also amplify the warming effect of other GHGs, such that the warming brought about by increased carbon dioxide allows more water vapor to enter the atmosphere.[15]

Global Climate Change Issue

Climate change is a global problem because GHGs are global pollutants, unlike criteria air pollutants and hazardous air pollutants (also called toxic air contaminants), which are pollutants of regional and local concern. Pollutants with localized air quality effects have relatively short atmospheric lifetimes, approximately 1 day; by contrast, GHGs have long atmospheric lifetimes, several years to several thousand years. GHGs persist in the atmosphere for a long enough time to be dispersed around the globe.

Although the exact lifetime of any particular GHG molecule depends on multiple variables and cannot be pinpointed, more CO_2 is currently emitted into the atmosphere than is sequestered. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through photosynthesis and dissolution, respectively. These are two of the most common processes of CO_2 sequestration. Of the total annual human-caused CO_2 emissions, approximately 54 percent is sequestered through ocean

[13] California Air Resources Board (ARB). 2015. Short-Lived Climate Pollutant Reduction Strategy, Concept Paper. May. Website: https://ww2.arb.ca.gov/resources/documents/slcp-strategy-draft-may2015. Accessed May 19, 2021.
[14] Ibid.
[15] National Aeronautics and Space Administration (NASA). 2015. NASA—Global Climate Change, Vital Signs of a Planet. Website: http://climate.nasa.gov/causes/. Accessed May 19, 2021.

uptake, Northern Hemisphere forest regrowth, and other terrestrial sinks within a year, whereas the remaining 46 percent of human-caused CO_2 emissions is stored in the atmosphere.[16]

Similarly, effects of GHGs are borne globally, as opposed to the localized air quality effects of criteria air pollutants and hazardous air pollutants. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known and cannot be quantified, and no single project would be expected to measurably contribute to a noticeable incremental change in the global average temperature, or to global or local climates or microclimate.

Emissions of GHGs have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change. A cumulative discussion and analysis of project impacts on global climate change is presented in this EIR because, although it is unlikely that a single project will contribute significantly to climate change, cumulative emissions from many projects affect global GHG concentrations and the climate system.

Global climate change has the potential to result in sea level rise (resulting in flooding of low-lying areas), to affect rainfall and snowfall (leading to changes in water supply), to affect temperatures and habitats (affecting biological resources and public health), and to result in many other adverse environmental consequences.

Although the international, national, State, and regional communities are beginning to address GHGs and the potential effects of climate change, worldwide GHG emissions will likely continue to rise over the next decades.

Climate and Topography

Climate is the accumulation of daily and seasonal weather events over a long period of time, whereas weather is defined as the condition of the atmosphere at any particular time and place. For a detailed discussion of existing regional and project site climate and topography, see Section 3.2, Air Quality.

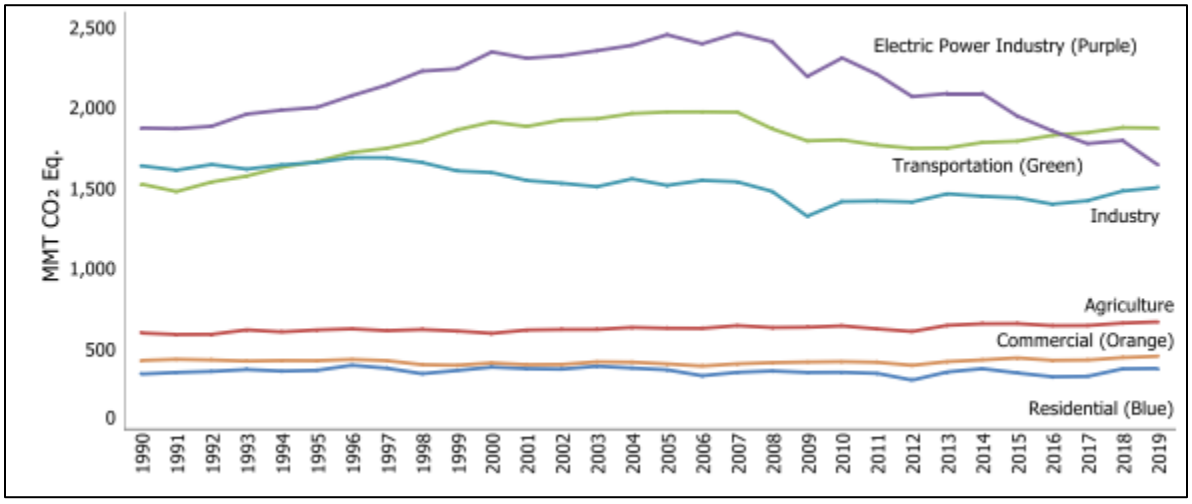
Existing GHG Emissions

United States GHG Inventory

Total U.S. GHG emissions have increased by 1.8 percent from 1990 to 2019.[17] Figure 3.6-2 presents the trend in U.S. GHG emissions by economic sector from 1990 to 2019. Total U.S. GHG emissions increased by 2.8 percent from 1990 to 2019 (an increase of 142.4 million metric tons [MMT] CO_2e). Since 1990, U.S. emissions have increased at an average annual rate of 0.3 percent. Transportation emissions also increased because of an increase in Vehicle Miles Traveled (VMT). Within the United States, fossil fuel combustion accounted for 92.4 percent of CO_2 emissions in 2019. Transportation was the largest emitter of CO_2 in 2019, accounting for 28.6 percent of emissions, followed by electric power generation, accounting for 25.1 percent.

[16] Seinfeld, J. H. and S.N. Pandis. 1998. Atmospheric Chemistry and Physics from Air Pollution to Climate Change. New York. John Wiley & Sons.

[17] United States Environmental Protection Agency (EPA). 2021. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 – Executive Summary. Website: https://www.epa.gov/sites/default/files/2021-04/documents/us-ghg-inventory-2021-chapter-executive-summary.pdf. Accessed September 13, 2021.



Note: Emissions shown do not include carbon sinks such as change in land uses and forestry.

Source: United States Environmental Protection Agency (EPA). 2021. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019 – Executive Summary. Website: https://www.epa.gov/sites/default/files/2021-04/documents/us-ghg-inventory-2021-chapter-executive-summary.pdf. Accessed September 13, 2021.

Figure 3.6-2: U.S. Greenhouse Gas Emissions Allocated to Economic Sectors (1990-2019)

California GHG Inventory

As the second largest emitter of GHG emissions in the United States., California contributes a large quantity (418.2 MMT CO_2e in 2019) of GHG emissions to the atmosphere.[18,19] Human-related emissions of CO_2 are largely byproducts of fossil fuel combustion and are attributable to transportation, industry/ manufacturing, electricity generation, natural gas consumption, and agriculture processes. In California, the transportation sector is the largest emitter at 41 percent of GHG emissions, followed by industrial at 24 percent of GHG emissions.[20]

Bay Area Air Quality Management District GHG Inventory

The Bay Area Air Quality Management District (BAAQMD) prepared a GHG inventory for the San Francisco Bay Area (Bay Area), which provides an estimate of GHG emissions in the base year 2011 for all counties located in the jurisdiction of BAAQMD: Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Napa, and the southern portions of Solano and Sonoma.[21] This GHG inventory is based on the standards for criteria pollutant inventories and is intended to support BAAQMD's climate protection activities.

Table 3.6-2 shows the 2011 breakdown of emissions by end-use sector for each county within the BAAQMD's jurisdiction. The estimated GHG emissions are presented in CO_2e, which weights each GHG by its GWP. The GWPs used in the BAAQMD inventory are from the Second Assessment Report of the IPCC.

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[18] World Resources Institute (WRI). 2017. 8 Charts to Understand US State Greenhouse Gas Emissions. Website: https://www.wri.org/insights/8-charts-understand-us-state-greenhouse-gas-emissions. Accessed September 10, 2021.

[19] California Air Resources Board (ARB). 2021. Current California GHG Emission Inventory Data, 2000-2019 Trends Figure Data. Website: https://ww2.arb.ca.gov/ghg-inventory-data. Accessed September 10, 2021.

[20] California Air Resources Board (ARB). 2018. California Greenhouse Inventory—Graphs. Website: https://ww3.arb.ca.gov/cc/inventory/pubs/reports/2000_2019/ghg_inventory_trends_00-19.pdf. Accessed September 13, 2021.

[21] Bay Area Air Quality Management District. (BAAQMD). 2015. Bay Area Emissions Inventory Summary Report: Greenhouse Gases - Base Year 2011. May 14, 2021.

In 2011, GHG emissions from the Napa County accounted for approximately 1.7 percent of the Bay Area's total GHG emissions with 0.2 percent of the Bay Area's total GHG emissions coming from the industrial/commercial land uses in Napa County.[22] Transportation is the largest GHG emissions sector in the Bay Area, followed by industrial/commercial, electricity generation and cogeneration, and residential fuel usage. In Napa County, the transportation also generates the largest amount of GHG emissions, followed by the industrial/commercial sector.

Table 3.6-2: 2011 GHG Emissions by Sector and County (MMT CO_2e/Year)

Sector	Alameda	Contra Costa	Marin	Napa	San Francisco	San Mateo	Santa Clara	Solano*	Sonoma*
Industrial/Commercial	2.7	17.8	0.4	0.2	1.2	1.4	4.1	2.7	0.5
Residential Fuel	1.3	1.0	0.3	0.1	0.9	0.8	1.5	0.3	0.4
Electricity/Co-gen	0.9	7.2	0.1	0.1	0.5	0.4	2.2	0.4	0.2
Off-road Equipment	0.2	0.2	0.0	0.0	0.2	0.1	0.4	0.0	0.
Transportation	7.9	5.0	1.3	0.9	3.0	5.0	7.6	1.6	2.0
Agriculture/Farming	0.1	0.2	0.2	0.1	0.0	0.0	0.2	0.1	0.2
Total	**13.2**	**31.4**	**2.4**	**1.5**	**5.7**	**7.7**	**16.0**	**5.1**	**3.5**

Notes:
* Portion within BAAQMD jurisdiction
BAAQMD = Bay Area Air Quality Management District
CO_2e = carbon dioxide equivalent
co-gen = cogeneration
MMT = million metric tons
Source: Bay Area Air Quality Management District. (BAAQMD). 2015. Bay Area Emissions Inventory Summary Report: Greenhouse Gases–Base Year 2011. Website: https://www.baaqmd.gov/~/media/files/planning-and-research/emission-inventory/by2011_ghgsummary.pdf. January. Accessed July 20, 2021.

Climate Change Trends and Effects

CO_2 accounts for more than 75 percent of all anthropogenic GHG emissions, the atmospheric residence time of CO_2 is decades to centuries, and global atmospheric concentrations of CO_2 continue to increase at a faster rate than ever previously recorded. Thus, the warming impacts of CO_2 will persist for hundreds of years after mitigation is implemented to reduce GHG concentrations.

California

Substantially higher temperatures, more extreme wildfires, and rising sea levels are just some of the direct effects experienced in California.[23,24] As reported by the California Natural Resources Agency in 2009, despite annual variations in weather patterns, California has seen a trend of increased

[22] Bay Area Air Quality Management District. (BAAQMD). 2015. Bay Area Emissions Inventory Summary Report: Greenhouse Gases - Base Year 2011. May 14, 2021.
[23] California Natural Resources Agency (CNRA). 2009. 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008. Website: http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf. Accessed May 19, 2021.
[24] California Energy Commission (CEC). 2012. Our Changing Climate 2012: Vulnerability & Adaptation to the Increasing Risks from Climate Change in California. Website: https://ucanr.edu/sites/Jackson_Lab/files/155618.pdf. Accessed May 19, 2021.

average temperatures, more extreme hot days, fewer cold nights, longer growing seasons, less winter snow, and earlier snowmelt and rainwater runoff. Statewide average temperatures increased by about 1.7°F from 1895 to 2011, and a larger proportion of total precipitation is falling as rain instead of snow.[25] Sea level rose by as much as 7 inches along the California coast over the last century, leading to increased erosion and adding pressure to the State's infrastructure, water supplies, and natural resources.

These observed trends in California's climate are projected to continue in the future. Research indicates that California will experience overall hotter and drier conditions with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased average temperatures and accelerating sea level rise. The frequency, intensity, and duration of extreme weather events such as heat waves, wildfires, droughts, and floods will also change.[26] In addition, increased air pollution and spread of insects potentially carrying infectious diseases will also occur as the climate-associated temperature and associated species clines shift in latitude.

In California, climate change may result in consequences such as the following.[27,28]

- **A reduction in the quality and supply of water from the Sierra snowpack.** If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. This can lead to challenges in securing adequate water supplies. It can also lead to a potential reduction in hydropower.
- **Increased risk of large wildfires.** If rain increases as temperatures rise, wildfires in the grasslands and chaparral ecosystems of Southern California are estimated to increase by approximately 30 percent toward the end of the 21st Century because more winter rain will stimulate the growth of more plant "fuel" available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more Northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.
- **Reductions in the quality and quantity of certain agricultural products.** The crops and products likely to be adversely affected include wine grapes, fruit, nuts, and milk.
- **Exacerbation of air quality problems.** If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the

[25] California Energy Commission (CEC). 2006. Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004. Draft Final Report. CEC-600-2006-013-D. Website: http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-D.PDF. Accessed May 19, 2021.

[26] California Natural Resources Agency (CNRA). 2009. 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008. Website: https://resources.ca.gov/CNRALegacyFiles/docs/climate/Statewide_Adaptation_Strategy.pdf. Accessed May 19, 2021.

[27] California Climate Change Center. (CCCC). 2006. Our Changing Climate, Assessing the Risks to California: A Summary Report from the California Climate Change Center. July 2006. CEC-500-2006-077. Website: http://climate.calcommons.org/bib/our-changing-climate-assessing-risks-california-summary-report-california-climate-change-center. Accessed May 19, 2021.

[28] Moser et al. 2009. Moser, Susie, Guido Franco, Sarah Pittiglio, Wendy Chou, Dan Cayan. 2009. The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California. California Energy Commission, PIER Energy-Related Environmental Research Program. CEC-500-2008-071. Website: https://resources.ca.gov/CNRALegacyFiles/docs/climate/Statewide_Adaptation_Strategy.pdf. Accessed May 19, 2021.

increase expected if rising temperatures remain in the lower warming range. This increase in air quality problems could result in an increase in asthma and other health-related problems.

- **A rise in sea levels resulting in the displacement of coastal businesses and residences.** During the past century, sea levels along California's coast have risen about seven inches. If emissions continue unabated and temperatures rise into the higher anticipated warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.
- **An increase temperature and extreme weather events.** Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in California. More heat waves can exacerbate chronic disease or heat-related illness.
- **A decrease in the health and productivity of California's forests.** Climate change can cause an increase in wildfires, an enhanced insect population, and establishment of non-native species.

Bay Area

The following is a summary of climate change factors and predicted trends specific to the Bay Area.

Temperature, Heat, Drought, and Wildfire Events

The Bay Area is expected to experience warming over the rest of the 21st Century. Consistent with Statewide projections, the annual average temperature in the Bay Area will likely increase by 2.7°F between 2000 and 2050, based on GHGs that have already been emitted into the atmosphere. By the end of the century, the increase in the Bay Area's annual average temperature may range from approximately 3.5°F to 11°F relative to the average annual temperature simulated for the 1961–1990 baseline period used for the study, depending on the GHG emissions scenarios.[29] The projected rate of warming, especially in the latter half of the 21st Century is considerably greater than warming rates derived from historical observed data.

Specific predictions related to temperature/heat are summarized below.

- The annual average temperature in the Bay Area has been increasing over the last several decades.
- The Bay Area is expected to see an increase in average annual temperature of 2.7°F by 2050, and 3.5°F to 11°F by 2100. Projections show a greater warming trend during the summer season. The coastal parts of the Bay Area will experience the most moderate warming trends.[30]
- Extreme heat events are expected to increase in duration, frequency, and severity by 2050. Extreme freeze events are expected to decrease in frequency and severity by 2100, but occasional colder-than-historical events may occur by 2050.[31]

[29] California Climate Change Center (CCCC). 2009. Climate Change Scenarios and Sea Level Rise Estimates for the California 2009 Climate Change Scenarios Assessment. Website: https://www.researchgate.net/publication/231181370_Climate_change_scenarios_and_sea_level_rise_estimates_for_the_California_2009_climate_change_scenarios_assessment. Accessed August 3, 2021.

[30] Cal-Adapt. 2021. Climate Tools. Website: http://cal-adapt.org/tools/. Accessed May 14, 2021.

[31] Ibid.

Precipitation, Rainfall, and Flooding Events

Studies of the effect of climate change on the long-term average precipitation for California show some variance.[32] Considerable variability exists across individual models and examining the average changes can mask more extreme scenarios that project much wetter or drier conditions. California is expected to maintain a Mediterranean climate through the next century, with dry summers and wet winters that vary between seasons, years, and decades. Wetter winters and drier springs are also expected, but overall annual precipitation is not projected to change substantially. By midcentury, more precipitation is projected to occur in winter in the form of less frequent but larger events. The majority of global climate models predict drying trends across the State by 2100.[33]

Specific factors related to precipitation/rainfall/extreme events are summarized below.

- The Bay Area has not experienced substantial changes in rainfall depth or intensities over the past 30 years.
- The Bay Area will continue to experience a Mediterranean climate, with little change in annual precipitation projected by 2050, although a high degree of variability may persist.
- An annual drying trend is projected to occur by 2100. The greatest decline in precipitation is expected to occur during the spring months, while minimal change is expected during the winter months.
- Increases in drought duration and frequency coupled with higher temperatures, as experienced in 2012, 2013, and 2014, will increase the likelihood of wildfires.
- California is expected to see increases in the magnitude of extreme events, including increased precipitation delivered from atmospheric river events, which would bring high levels of rainfall during short time periods and increase the chance of flash floods. The Bay Area is also expected to see an increase in precipitation intensities, but possibly through less frequent events.[34]

Reduced Sierra Nevada Snowpack and Water Supply Shortages

If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. This can lead to challenges in securing adequate surface water supplies.

Vectors and Disease Events

Climate change will likely increase vector insect populations and, in turn, may increase the risk of some infectious diseases, particularly those diseases that appear in warm areas, such as malaria, dengue fever, yellow fever, and encephalitis.

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[32] California Climate Change Center (CCCC). 2009. Climate Change Scenarios and Sea Level Rise Estimates for the California 2009 Climate Change Scenarios Assessment. CEC-500-2009-014-F. Website: https://www.researchgate.net/publication/231181370_Climate_change_scenarios_and_sea_level_rise_estimates_for_the_California_2009_climate_change_scenarios_assessment. Accessed August 3, 2021.

[33] California Natural Resources Agency (CNRA). 2009. 2009 California Climate Adaptation Strategy: A Report to the Governor of the State of California in Response to Executive Order S-13-2008.

[34] California Climate Change Center (CCCC) 2009. Climate Change Scenarios and Sea Level Rise Estimates for the California 2009 Climate Change Scenarios Assessment. CEC-500-2009-014-F. August.

Air Quality and Pollution Events

Warming-induced increases in the frequency of smog (ground-level ozone) events and particulate air pollution will exacerbate respiratory disorders.[35] Although there could be health effects resulting from changes in the climate and the consequences that can occur, inhalation of GHGs at levels currently in the atmosphere would not result in adverse health effects, with the exception of ozone and aerosols (particulate matter). The potential health effects of ozone and particulate matter are discussed in criteria pollutant analyses. At very high indoor concentrations (not at levels existing outside), carbon dioxide, methane, SF_6, and some chlorofluorocarbons can cause suffocation as the gases can displace oxygen.[36,37]

Napa County

Temperature, Heat, Drought, and Wildfire Events

The County of Napa is expected to experience warming over the rest of the 21st Century. Consistent with Statewide projections, the annual average temperature in the County will likely increase by 2.7°F above 2000 averages by 2050 and, depending on emission levels, 4.1-8.6°F by 2100.[38] Changes in precipitation patterns and increased temperatures associated with climate change will alter plants and soils distribution and character or natural vegetation and associated moisture content. Increased temperature is expected to lead to secondary climate change impacts including increases in frequency, intensity, and duration of extreme events and heat waves in California.

The County has a historical average of four extreme heat days a year and is projected to increase to an annual average of 23-26 extreme heat days per year in 2050. Events in which these extreme temperatures are experienced over a period of several days are known as heat waves. The County has a heat threshold of 92°F and when exceeded for a period of five days, qualifies as a heat wave. Heat waves in the County are infrequent, with no more than two heat waves occurring in one year between 1950 and 2016, but are projected to increase in frequency toward the middle of the century. Along with an increased frequency of heat events, heat waves are also projected to occur both earlier and later in the season, which historically started in late May to early June and ended in mid-September.

Precipitation, Rainfall, and Flooding Events

Reduced precipitation in the County of Napa could lead to higher risks of drought, while increased precipitation could cause flooding or soil erosion.

The County is not located in an area where snow typically accumulates, major water districts and utilities in the County receive a significant amount of water from the State Water Project, which depends on spring and early-summer snowmelt in the Sierra Nevada for water supply. Additionally, agricultural water users in the unincorporated areas of the County are the primary users of groundwater. Increased average temperatures and changes in the timing and amounts of

[35] United States Environmental Protection Agency (EPA) 2009. Ozone and your Health. EPA-456/F-09-001. February.
[36] National Institute for Occupational Safety and Health (NIOSH) 2018. Carbon Dioxide. November 29. Website: www.cdc.gov/niosh/npg/npgd0103.html. Accessed May 19, 2021.
[37] Occupational Safety and Health Administration (OSHA) 2003. United States Department of Labor. Safety and Health Topics: Methane. Website: www.osha.gov/dts/chemicalsampling/data/CH_250700.html. Accessed May 19, 2021.
[38] County of Napa. 2012. Napa County Revised Draft Climate Action Plan. Website: https://www.countyofnapa.org/DocumentCenter/View/9247/Revised-Draft-CAP-PDF?bidId=. Accessed July 28, 2021.

precipitation could affect local aquifer recharge for groundwater supplies, and thus the County could face increasing challenges of providing adequate water supplies because of increased uncertainty in the amount and timing of water availability to meet future demand. If demand exceeds supply, water users could face shortages in normal or dry years.

According to Napa County's Operational Area Hazard Mitigation Plan, the County is already considerably vulnerable to flooding. Flooding has caused the most disaster declarations and the most damage and loss of life historically in the County, with floods usually occurring during the highest precipitation season or heavy rainfall after prolonged dry periods. Almost all of the land adjacent to the Napa River is subject to flooding that has a 1 percent probability of occurring in any given year, or a 100-year flood event. While it is uncertain exactly how and to what extent climate change will affect flooding events in the County, it is reasonable to assume that any increase in flooding could have serious ramifications as the area is already considerably vulnerable. Additional information on increased risk of flooding, which could be exacerbated by sea level rise in the southern portion of the County, is included below.

The southwestern portion of the County includes the mouth of the Napa River, which forms a tidal estuary that drains into San Pablo Bay. Less than 1 percent of the County's population is considered at risk and vulnerable to sea level rise. Because several physical structures (i.e., levees) are currently in place to protect against a 100-year flood event, approximately 36 acres in the County are currently at risk for flooding. The American Canyon Power Plant and the Napa Sanitation District Water Treatment Plant could become vulnerable to a 100-year flood event with 1.4 meters (m) of sea level rise. The majority of area that is at risk is currently undeveloped or used for agricultural purposes. Specific areas along the Napa River that could become vulnerable include Buchli, Cuttings Wharf, Thompson, and Imola, along with areas further north along the Napa River, including some industrial uses, wineries, and parts of Downtown Napa (i.e., up to 3rd Street and portions east of State Route 29).

Vectors and Disease Events

A changing climate is expected to subject forests to increased stress due to drought, disease, invasive species, and insect pests. These stressors are likely to make forests more vulnerable to catastrophic fire.

Air Quality and Pollution Events

According to Napa County's Operational Area Hazard Mitigation Plan, the County has a history of wildfires. Before the 2017 wildfires, more than 200,000 acres of the County's 482,000 acres burned in the last 30 years, most of which occurred in the unincorporated areas. The County is already considered to be an area that is at high risk for wildfires, which is only expected to increase by the end of the century. This increase could cause additional threats to the County and has the potential to affect emergency services, roads, water supplies to residents, housing access, and quality of life. Heavy winter rainfall resulted in an abundance of vegetation, which dried out in the summer, creating hazardous fuel conditions. Under the low-emissions scenario, when compared with a baseline year of 2010 wildfires are 11 percent more likely to occur in 2020, 15 percent more likely to occur in 2050, and 12 percent more likely to occur in 2085. Under the high-emissions scenario, compared to the 2010 baseline year wildfires are 14 percent more likely to occur in 2020, 13 percent

more likely in 2050, and 22 percent more likely to occur in 2085. Given that the County is currently at risk for wildfire, these increases of between 10 and 20 percent under both emissions scenarios is significant and could result in additional threats and increased vulnerability.

Energy Basics

Energy is generally transmitted either in the form of electricity, measured in kilowatt-hours (kWh)[39] or megawatt-hours (MWh),[40] or natural gas measured in therms.[41]

Electricity

Electricity is used primarily for lighting, appliances, and other uses associated with operation of the proposed project.

Natural Gas

Natural gas is used primarily for heating and water heating associated with operation of the proposed project.

Fuel

Fuel is used primarily for powering off-road equipment, trucks, and worker vehicles. The typical fuel types used are diesel and gasoline.

Electricity Generation, Distribution, and Use

State of California

In 2019, the State of California generated approximately 277,704 gigawatt-hours (GWh) of electricity which decreased by 2.7 percent from 2018.[42] Approximately 68 percent of the energy generation is sourced from natural gas, coal, and non-renewables and 32 percent from renewable sources (i.e., solar, wind, and geothermal.[43]

In 2019, California ranked second in the nation in conventional hydroelectric generation, fourth in electricity production, and first as a producer of electricity from solar, geothermal, and biomass resources. California leads the nation in solar thermal electricity capacity and generation.

Electricity and natural gas is distributed through the various electric load-serving entities (LSEs) in California. These entities include investor-owned utilities (IOUs), publicly owned LSEs, rural electric cooperatives, community choice aggregators, and electric service providers.[44]

[39] 1 kW = 1.000 watts; A watt is a derived unit of power that measures rate of energy conversion. 1 watt is equivalent to work being done at a rate of 1 joule of energy per second. In electrical terms, 1 watt is the power dissipated by a current of 1 ampere flowing across a resistance of 1 volt.

[40] 1 MW = 1 million watts

[41] A unit for quantity of heat that equals 100,000 British thermal units. A British thermal unit is the quantity of heat required to raise the temperature of 1 pound of liquid water 1 degree Fahrenheit at a constant pressure of 1 atmosphere.

[42] California Energy Commission (CEC). 2020. 2019 Total System Electric Generation. Website: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2020-total-system-electric-generation/2019. Accessed September 13, 2021.

[43] California Energy Commission (CEC). 2020. 2019 Total System Electric Generation. Website: https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/2020-total-system-electric-generation/2019. Accessed September 13, 2021.

[44] California Energy Commission (CEC). Electric Load-Serving Entities (LSEs) in California Website: https://www.energy.ca.gov/almanac/electricity_data/utilities.html. Accessed August 20, 2021.

County of Napa

Pacific Gas and Electric Company (PG&E) provides electricity to many of the cities throughout Napa County. Local community choice aggregations (CCAs) can also provide electricity services alternative to the region's traditional utility supplier, PG&E. The local CCA for American Canyon is Marin Clean Energy (MCE). With the passing of SB 790 in 2011, residential and commercial customers within a local CCA jurisdiction are automatically enrolled in that CCA's electricity service but retain the ability to opt-out and return to their traditional utility supplier.

According to the California Energy Commission (CEC), Napa County's energy consumption was approximately 1,043 GWh in 2019.[45] As Napa County's population in 2019 was an estimated 139,608 people,[46] the County experienced a per capita electricity consumption of an estimated 7,471 kWh per year.

Project Site

The project site is currently vacant and does not consume electricity. PG&E provides electricity to the project site.

Natural Gas Generation, Distribution, and Use

State of California

Natural gas is used for everything from generating electricity to cooking and space heating to an alternative transportation fuel. Natural gas generation (in kWh) represented 11 percent of electric power generation in 1990 and increased over the 30-year period to represent 34 percent of electric power generation in 2019.[47] In 2019, the State ranked 14 in natural gas marketed production, producing 196,823 million cubic feet of natural gas.[48]

Natural gas-fired generation has become the dominant source of electricity in California, as it currently fuels approximately 45 percent of electricity consumption.[49] Because natural gas is a dispatchable resource that provides load when the availability of hydroelectric power generation and/or other sources decrease, use varies greatly from year to year. The availability of hydroelectric resources, the emergence of renewable resources for electricity generation, and overall consumer demand are the variables that shape natural gas use in electric generation.

[45] California Energy Commission (CEC). 2020. Electricity Generation by County. Website: https://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed September 22, 2021.

[46] California Department of Finance (CDF). 2021. E-4 Population Estimates for Cities, Counties, and the State, 2011-2021 with 2010 Census Benchmark. Website: https://dof.ca.gov/forecasting/Demographics/estimates/estimates-e4-2010-2021/. Accessed April 11, 2022.

[47] United States Environmental Protection Agency (EPA). 2016. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2019. Website: https://www.epa.gov/sites/default/files/2021-04/documents/us-ghg-inventory-2021-main-text.pdf?VersionId=wEy8wQuGrWS8Ef_hSLXHy1kYwKs4.ZaU. Accessed September 13, 2021

[48] United States Energy Information Administration (EIA). 2020. Rankings: Natural Gas Marketed Production, 2019. Website: https://www.eia.gov/state/rankings/?sid=CA#series/47. Accessed September 13, 2021.

[49] California Energy Commission (CEC). 2021. Supply and Demand of Natural Gas in California. Website: https://www.energy.ca.gov/data-reports/energy-almanac/californias-natural-gas-market/supply-and-demand-natural-gas-california. Accessed September 20, 2021.

County of Napa

As mentioned prior, PG&E provides natural gas to the unincorporated portions of Napa County. In 2019, Napa County's natural gas consumption was approximately 40 million US Therms, or approximately 3,971,812 million British thermal units (MMBtu).[50] As Napa County's population in 2019 was an estimated 139,608 people,[51] the County experienced a per capita natural gas consumption of an estimated 28.45 MMBtu per year.

Fuel Use

State of California

California is one of the top producers of petroleum in the nation, with drilling operations occurring throughout the State. A network of crude oil pipelines connects production areas to oil refineries in the Los Angeles area, the San Francisco Bay Area, and the Central Valley. California oil refineries also process Alaskan and foreign crude oil received in ports in Los Angeles, Long Beach, and the San Francisco Bay Area. Crude oil production in California and Alaska is in decline, and California refineries have become increasingly dependent on foreign imports.[52] Since 2012, foreign suppliers, led by Saudi Arabia, provide over half of the crude oil refined in California.[53,54] According to the United States Energy Information Administration (EIA), California's field production of crude oil has steadily declined since the mid-1980s, totaling approximately 161.5 million barrels in 2019.[55]

According to the EIA, transportation accounted for nearly 40 percent of California's total energy demand, amounting to approximately 3,170 trillion British Thermal Unit (BTU) in 2018.[56] California's transportation sector, including rail and aviation, consumed roughly 584 million barrels of petroleum fuels in 2018.[57] In 2018, petroleum-based fuels were used for approximately 86 percent of the State's total transportation activity.[58] The CEC produces the California Annual Retail Fuel Outlet Report, which is a compilation of gasoline and diesel fuel sales data from across the State available at the county level. According to the CEC, California's 2019 fuel sales totaled 15,365 million gallons of gasoline and 3,720 million gallons of diesel.[59]

[50] California Energy Commission (CEC). 2020. Electricity Generation by County. Website: https://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed September 22, 2021.

[51] California Department of Finance (CDF). 2021. E-4 Population Estimates for Cities, Counties, and the State, 2011-2021 with 2010 Census Benchmark. Website: https://dof.ca.gov/forecasting/Demographics/estimates/estimates-e4-2010-2021/. Accessed April 11, 2022.

[52] California Energy Commission (CEC). 2020. "Oil Supply Sources to California Refineries." Website: https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/oil-supply-sources-california-refineries. Accessed July 21, 2021.

[53] California Energy Commission (CEC). 2019. "Foreign Sources of Crude Oil Imports to California 2018." March. Website: https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/foreign-sources-crude-oil-imports. Accessed July 21, 2021.

[54] California Energy Commission (CEC). 2020. "Oil Supply Sources to California Refineries." Website: https://www.energy.ca.gov/data-reports/energy-almanac/californias-petroleum-market/oil-supply-sources-california-refineries. Accessed July 21, 2021.

[55] United States Department of Energy, Alternative Fuels Data Center. 2020. "Alternative Fueling Station Locator [Interactive Database]." Website: https://afdc.energy.gov/stations/#/find/nearest. Accessed July 21, 2021.

[56] United States Energy Information Administration (EIA). 2020. Table F33: Total Energy Consumption, Price, and Expenditure Estimates, 2019. Website: https://www.eia.gov/state/seds/sep_fuel/html/pdf/fuel_te.pdf. Accessed August 20, 2021.

[57] United States Energy Information Administration (EIA). 2020. Table F16: Total Petroleum Consumption Estimates, 2019. Website: https://www.eia.gov/state/seds/sep_fuel/html/pdf/fuel_use_pa.pdf. Accessed August 20, 2021.

[58] United States Energy Information Administration (EIA). 2020. Table F18: Natural Gas Consumption Estimates, 2019. Website: https://www.eia.gov/state/seds/seds-data-fuel.php?sid=CA#NaturalGas. Accessed August 20, 2021.

[59] California Energy Commission (CEC). 2019. 2010-2019 CEC-A15 Results and Analysis. Website: https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-retail-fuel-outlet-annual-reporting. Accessed September 13, 2021.

Alternative Fuels

A variety of alternative fuels are used to reduce petroleum-based fuel demand. The use of these fuels is encouraged through various Statewide regulations and plans, such as the Low Carbon Fuel Standard (LCFS) and SB 32. Conventional gasoline and diesel may be replaced, depending on the vehicle's capability, with transportation fuels including hydrogen, biodiesel, and electricity. Currently, 44 public hydrogen refueling stations exist in California; however, none are in the City.[60,61] Currently, 10 public biodiesel refueling stations are in California, with none in the City.[62]

Electric Vehicles

Electricity can be used to power electric and plug-in hybrid electric vehicles (EVs) directly from the power grid. Electricity used to power vehicles is generally provided by the electricity grid and stored in the vehicle's batteries. Fuel cells are being explored to use electricity generated onboard the vehicle to power electric motors. Currently, California has 13,048 EV charging stations.[63] According to the United States Department of Energy's (DOE) Alternative Fuels Data Center, Napa County has 172 EV charging stations at 65 charging locations.[64]

Project Site

The project site is currently vacant and does not consume any fuels.

3.6.3 - Regulatory Framework

International

United Nations Climate Change Framework Convention

On March 21, 1994, the United States joined a number of countries around the world in signing the United Nations Climate Change Framework Convention. Under the Convention, governments agreed to gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

Western Climate Initiative (Western North America Cap-and-Trade Program)

Cap-and-trade refers to a policy tool where emissions are limited to a certain amount and can be traded, or provides flexibility on how the emitter can comply. Each emitter caps carbon dioxide emissions from power plants, auctions carbon dioxide emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and

[60] United State Department of Energy (DOE). Alternative Fuels Data Center. 2020. Alternative Fueling Station Locator [Interactive Database]. Website: https://afdc.energy.gov/stations/#/find/nearest. Accessed July 21, 2021.
[61] United State Department of Energy (DOE). Alternative Fuels Data Center. 2020. Alternative Fueling Station Counts by State. June. Website: https://afdc.energy.gov/stations/states. Accessed July 21, 2021.
[62] Ibid.
[63] United States Department of Energy (DOE). No Date. Alternative Fuels Data Center: Electric Vehicle Charging Station Locations. Website: https://afdc.energy.gov/fuels/electricity_locations.html#/analyze?region=US-CA&fuel=ELEC&ev_levels=all. Accessed July 21, 2021.
[64] Department of Energy (DOE) Alternative Fuels Data Center. 2020. Electric Vehicle Charging Station Locations. Website: https://afdc.energy.gov/fuels/electricity_locations.html#/analyze?country=US&location_mode=address&location=Solano%20County. Accessed September 22, 2021.

build a clean energy economy. The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce North America GHG emissions to 15 percent below 2005 levels by 2020. The partners are California, British Columbia, Manitoba, Ontario, and Québec. Currently only California and Québec are participating in the Cap-and-Trade Program.[65]

Kyoto Protocol

The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions at average of 5 percent against 1990 levels over the 5-year period from 2008–2012. The Convention (as discussed above) encouraged industrialized countries to stabilize emissions; however, the Protocol commits them to do so. Developed countries have contributed more emissions over the last 150 years; therefore, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."

In 2001, President George W. Bush indicated that he would not submit the treaty to the U.S. Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. In December 2009, international leaders met in Copenhagen to address the future of international climate change commitments post-Kyoto. No binding agreement was reached in Copenhagen; however, the Committee identified the long-term goal of limiting the maximum global average temperature increase to no more than 2°C above preindustrial levels, subject to a review in 2015. The Climate Change Committee held additional meetings in Durban, South Africa in November 2011; Doha, Qatar in November 2012; and Warsaw, Poland in November 2013. The meetings are gradually gaining consensus among participants on individual climate change issues.

On September 23, 2014, more than 100 heads of state and government, and leaders from the private sector and civil society met at the Climate Summit in New York hosted by the United Nations. At the Summit, heads of government, business and civil society announced actions in areas that would have the greatest impact on reducing emissions, including climate finance, energy, transport, industry, agriculture, cities, forests, and building resilience.

Paris Climate Change Agreement

Parties to the United Nations Framework Convention on Climate Change (UNFCCC) reached a landmark agreement on December 12, 2015, in Paris, charting a fundamentally new course in the two-decade-old global climate effort. Culminating a 4-year negotiating round, the treaty ended the strict differentiation between developed and developing countries that characterized earlier efforts, replacing it with a common framework that commits all countries to put forward their best efforts and to strengthen them in the years ahead. For the first time, this included requirements that all parties report regularly on their emissions and implementation efforts and undergo international review.

[65] Center for Climate and Energy Solutions (C^2ES). 2015. Multi-State Climate Initiatives. Website: http://www.c2es.org/us-states-regions/regional-climate-initiatives. Accessed May 19, 2021.

The agreement and a companion decision by parties were the key outcomes of the conference, known as the 21st session of the UNFCCC Conference of the Parties, or "COP 21." Together, the Paris Agreement and the accompanying COP decision:

- Reaffirm the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees;
- Establish binding commitments by all parties to make "nationally determined contributions" (NDCs), and to pursue domestic measures aimed at achieving them;
- Commit all countries to report regularly on their emissions and "progress made in implementing and achieving" their NDCs, and to undergo international review;
- Commit all countries to submit new NDCs every five years, with the clear expectation that they will "represent a progression" beyond previous ones;
- Reaffirm the binding obligations of developed countries under the UNFCCC to support the efforts of developing countries, while for the first time encouraging voluntary contributions by developing countries too;
- Extend the current goal of mobilizing $100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025;
- Extend a mechanism to address "loss and damage" resulting from climate change, which explicitly will not "involve or provide a basis for any liability or compensation;"
- Require parties engaging in international emissions trading to avoid "double counting;" and
- Call for a new mechanism, similar to the Clean Development Mechanism under the Kyoto Protocol, enabling emission reductions in one country to be counted toward another country's NDC.[66]

On June 1, 2017, President Trump announced the decision for the United States to withdraw from the Paris Agreement.[67] However, on January 20, 2021, President Biden signed the instrument to bring the United States back into the Paris Agreement that same day. Nonetheless, California remains committed to combating climate change through programs aimed to reduce GHGs.[68]

Federal

Massachusetts et al. v. EPA (U.S. Supreme Court GHG Endangerment Ruling)

Massachusetts et al. v. EPA (Supreme Court Case 05-1120) was argued before the United States Supreme Court on November 29, 2006, in which it was petitioned that the United States Environmental Protection Agency (EPA) regulate four GHGs, including CO_2, under Section 202(a)(1) of the Clean Air Act (CAA). A decision was made on April 2, 2007, in which the Supreme Court found

[66] Center for Climate and Energy Solutions (C^2ES). 2015a. Outcomes of the U.N. Climate Change Conference. Website: http://www.c2es.org/international/negotiations/cop21-paris/summary. Accessed May 19, 2021.

[67] The White House. Statement by President Trump on the Paris Climate Accord. Website: https://it.usembassy.gov/statement-president-trump-paris-climate-accord/. May 19, 2021.

[68] California Air Resources Board (ARB). 2017. New Release: California and China Team Up to Push for Millions More Zero-emission Vehicles. Website: https://ww2.arb.ca.gov/news/california-and-china-team-push-millions-more-zero-emission-vehicles. Accessed May 19, 2021.

that GHGs are air pollutants covered by the CAA. The Court held that the Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

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

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed under "Clean Vehicles" below. After a lengthy legal challenge, the U.S. Supreme Court declined to review an Appeals Court ruling which upheld the EPA Administrator findings.

United States Consolidated Appropriations Act (Mandatory GHG Reporting)

The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 MT or more per year of GHG emissions are required to submit annual reports to the EPA. The first annual reports for the largest emitting facilities, covering calendar year 2010, were submitted to EPA in 2011.

United States Clean Air Act Permitting Programs (New GHG Source Review)

The EPA issued a final rule on May 13, 2010, which establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these CAA permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the Code of Federal Regulations, the EPA states:

> This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the Clean Air Act, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to greenhouse gas sources, starting with the largest greenhouse gas emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps

addressing smaller sources, but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for greenhouse gas emissions until at least April 30, 2016.

The EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

Energy Independence and Security Act

The Energy Policy Act of 2005 created the Renewable Fuel Standard program. The Energy Independence and Security Act of 2007 expanded this program by:

- Expanding the Renewable Fuel Standard program to include diesel in addition to gasoline;
- Increasing the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022;
- Establishing new categories of renewable fuel, and setting separate volume requirements for each one; and
- Requiring EPA to apply lifecycle GHG performance threshold standards to ensure that each category of renewable fuel emits fewer GHGs than the petroleum fuel it replaces.

This expanded Renewable Fuel Standard program lays the foundation for achieving substantial reductions of GHG emissions from the use of renewable fuels, reducing the use of imported petroleum, and encouraging the development and expansion of the nation's renewable fuels sector.

Signed on December 19, 2007, by President George W. Bush, the Energy Independence and Security Act of 2007 (EISA) aims to:

- Move the United States toward greater energy independence and security.
- Increase the production of clean renewable fuels.
- Protect consumers.
- Increase the efficiency of products, buildings, and vehicles.
- Promote research on and deploy greenhouse gas capture and storage options.
- Improve the energy performance of the federal government.
- Increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy.

EISA reinforces the energy reduction goals for federal agencies put forth in Executive Order 13423 and introduces more aggressive requirements. The three key provisions enacted are the Corporate Average Fuel Economy Standards, the Renewable Fuel Standard, and the appliance/lighting efficiency standards.

The EPA is committed to developing, implementing, and revising both regulations and voluntary programs under the following subtitles in EISA, among others:

- Increased Corporate Average Fuel Economy Standards
- Federal Vehicle Fleets
- Renewable Fuel Standard
- Biofuels Infrastructure
- Carbon Capture and Sequestration[69]

EPA and National Highway Traffic Safety Administration Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards Final Rule

Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light-duty trucks. The law has become more stringent over time. On May 19, 2009, President Barack Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States.

The first phase of the national program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements. Together, these standards would cut CO_2 emissions by an estimated 960 MMT and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

The EPA and the NHTSA issued final rules on a second phase joint rulemaking, establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012.[70] The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles. The final standards are projected to result in an average industry fleet wide level of 163 grams/mile of CO_2 in model year 2025, which is equivalent to 54.5 miles per gallon if achieved exclusively through fuel economy improvements.

The EPA and NHTSA issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses on September 15, 2011, which became effective November 14, 2011. For combination tractors, the agencies are proposing engine and vehicle standards that began in the 2014 model year and achieve up to a 20 percent reduction in CO_2 emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10 percent reduction for gasoline vehicles, and a 15 percent reduction for diesel vehicles by 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10 percent reduction in fuel consumption and CO_2 emissions from the 2014 to 2018 model years.

[69] United States Environment Protection Agency (EPA). Summary of the Energy Independence and Security Act. Website: https://www.epa.gov/laws-regulations/summary-energy-independence-and-security-act. Accessed May 19, 2021.

[70] United States Environmental Protection Agency (EPA). 2012. EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks. EPA-420-F-12-051. August.

The State of California has received a waiver from the EPA to have separate, stricter Corporate Average Fuel Economy Standards. Although global climate change did not become an international concern until the 1980s, efforts to reduce energy consumption began in California in response to the oil crisis in the 1970s, resulting in the incidental reduction of GHG emissions. In order to manage the State's energy needs and promote energy efficiency, AB 1575 created the CEC in 1975.

State

California Assembly Bill 32: Global Warming Solutions Act and Scoping Plan

The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "Greenhouse gases" as defined under AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The ARB is the State agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the State from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

The ARB approved the 1990 GHG emissions level of 427 MMT CO_2e on December 6, 2007.[71] Therefore, to meet the State's target, emissions generated in California in 2020 were required to be equal to or less than 427 MMT CO_2e. Emissions in 2020 in a business-as-usual (BAU) scenario were estimated to be 596 MMT CO_2e, which do not account for reductions from AB 32 regulations.[72] At that rate, a 28 percent reduction was required to achieve the 427 MMT CO_2e 1990 inventory. In October 2010, the ARB prepared an updated 2020 forecast to account for the effects of the 2008 recession and slower forecasted growth. The 2020 inventory without the benefits of adopted regulation is now estimated at 545 MMT CO_2e. Therefore, under the updated forecast, a 21.7 percent reduction from a BAU scenario is required to achieve 1990 levels.[73]

The State has made steady progress in implementing AB 32. The progress is shown in updated emission inventories prepared by ARB for 2000 through 2012 to show progress achieved to date.[74] The State also achieved its target for 2010 of reducing GHG emissions to 2000 levels. As shown below, the 2010 emission inventory achieved this target. Also shown are the average reductions

[71] California Air Resources Board (ARB). 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. Website: www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf. Accessed May 19, 2021.

[72] California Air Resources Board (ARB). 2008. Climate Change Scoping Plan, a framework for change. Website: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed May 19, 2021.

[73] California Air Resources Board (ARB). 2014. GHG 2020 Business-as-Usual Emissions Projection. Website: https://ww2.arb.ca.gov/ghg-bau. Accessed August 3, 2021.

[74] California Air Resources Board (ARB). 2014. California Greenhouse Gas Emissions for 2000 to 2012—Trends of Emissions and Other Indicators. Website: http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf. Accessed May 19, 2021.

needed from all Statewide sources (including all existing sources) to reduce GHG emissions back to 1990 levels.

- **1990:** 427 MMT CO_2e (AB 32 2020 Target)
- **2000:** 463 MMT CO_2e (an average 8 percent reduction needed to achieve 1990 base)
- **2010:** 450 MMT CO_2e (an average 5 percent reduction needed to achieve 1990 base)
- **2020:** 545 MMT CO_2e BAU (an average 21.7 percent reduction from BAU needed to achieve 1990 base)

The ARB's initial Climate Change Scoping Plan (Scoping Plan) contained measures designed to reduce the State's emissions to 1990 levels by the year 2020 to comply with AB 32.[75] The Scoping Plan identified recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector had a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a Statewide renewables energy mix of 33 percent;
- Developing a California Cap-and-Trade Program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the LCFS; and
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. Capped strategies are subject to the ARB's Cap-and-Trade Program. The Scoping Plan states that the inclusion of these emissions within the Cap-and-Trade Program would help ensure that the year 2020 emission targets were met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve sufficient reductions by 2020 to achieve the emission target contained in AB 32. Uncapped strategies that will not be subject to the cap-and-trade emissions limits and requirements were provided as a margin of safety by accounting for additional GHG emission reductions.[76]

[75] California Air Resources Board (ARB). 2008. Climate Change Scoping Plan, a framework for change. Website: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed May 19, 2021.

[76] California Air Resources Board (ARB). 2008. Climate Change Scoping Plan, a framework for change. Website: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed May 19, 2021.

The Cap-and-Trade Program remains a key element of the Scoping Plan. It sets a Statewide limit on sources responsible for 85 percent of California's GHG emissions and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The program is designed to provide covered entities the flexibility to seek out and implement the lowest cost options to reduce emissions. The program conducted its first auction in November 2012. Compliance obligations began for power plants and large industrial sources in January 2013. Other significant milestones include linkage to Québec's cap-and-trade system in January 2014 and starting the compliance obligation for distributors of transportation fuels, natural gas, and other fuels in January 2015.[77]

The Cap-and-Trade Program provides a firm cap, ensuring that the 2020 Statewide emission limit would not be exceeded. An inherent feature of the Cap-and-Trade Program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. As summarized by the ARB in the First Update:

> The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced. In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative.[78]

The Cap-and-Trade Program works with other direct regulatory measures and provides an economic incentive to reduce emissions. If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions reductions. Thus, the Cap-and-Trade Program assures that California will meet its 2020 GHG emissions reduction mandate:

> The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the "capped sectors." Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives

[77] California Air Resources Board (ARB). 2015. ARB Emissions Trading Program. Website: https://ww2.arb.ca.gov/sites/default/files/classic/cc/capandtrade/guidance/cap_trade_overview.pdf Accessed May 19, 2021.

[78] California Air Resources Board (ARB). 2014. First Update to the Climate Change Scoping Plan. Website https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. Accessed May 19, 2021.

posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. The Cap-and-Trade Regulation provides assurance that California's 2020 limit will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions. In sum, the Cap-and-Trade Program will achieve aggregate, rather than site specific or project-level, GHG emissions reductions.

Also, due to the regulatory architecture adopted by ARB in AB 32, the reductions attributed to the Cap-and-Trade Program can change over time depending on the State's emissions forecasts and the effectiveness of direct regulatory measures.[79]

California Senate Bill 32

The Governor signed SB 32 in September of 2016, giving the ARB the statutory responsibility to include the 2030 target previously contained in Executive Order B-30-15 in the 2017 Scoping Plan Update. SB 32 states, "In adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by this division, the state [air resources] board shall ensure that Statewide greenhouse gas emissions are reduced to at least 40 percent below the Statewide greenhouse gas emissions limit no later than December 31, 2030." As such, SB 32 lays the foundation for the legislative reduction targets for 2030.

2017 Scoping Plan

The most recent version of the ARB's Scoping Plan, the 2017 Climate Change Scoping Plan Update, addresses the SB 32 targets and was adopted on December 14, 2017. The major elements of the framework proposed to achieve the 2030 target are as follows:

1. SB 350
   - Achieve 50 percent Renewables Portfolio Standard by 2030.
   - Doubling of energy efficiency savings by 2030.
2. Low Carbon Fuel Standard
   - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020).
3. Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
   - Maintaining existing GHG standards for light- and heavy-duty vehicles.
   - Put 4.2 million Zero-Emission Vehicles (ZEVs) on the roads.
   - Increase ZEV buses, delivery and other trucks.
4. Sustainable Freight Action Plan
   - Improve freight system efficiency.
   - Maximize use of near-ZEVs and equipment powered by renewable energy.
   - Deploy over 100,000 zero-emission trucks and equipment by 2030.
5. Short-Lived Climate Pollutant Reduction Strategy

[79] California Air Resources Board (ARB). 2014. First Update to the Climate Change Scoping Plan. Website: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. Accessed May 19, 2021.

- Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
- Reduce emissions of black carbon 50 percent below 2013 levels by 2030.

6. SB 375 Sustainable Communities Strategies
   - Increased stringency of 2035 targets.
7. Post-2020 Cap-and-Trade Program
   - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
   - The ARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements. In Fall 2016, the ARB staff described potential future amendments including reducing the offset usage limit, redesigning the allocation strategy to reduce free allocation to support increased technology and energy investment at covered entities and reducing allocation if the covered entity increases criteria or toxics emissions over some baseline.
8. 20 percent reduction in GHG emissions from the refinery sector.
9. By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

California Senate Bill 350: Clean Energy and Pollution Reduction Act

In 2015, the State Legislature approved, and the Governor signed, SB 350, which reaffirmed California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the RPS, higher energy efficiency requirements for buildings, initial strategies toward a regional electricity grid, and improved infrastructure for EV charging stations. Provisions for a 50 percent reduction in the use of petroleum Statewide were removed from the Bill due to opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce Statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33 percent to 50 percent by 2030, with interim targets of 40 percent by 2024, and 25 percent by 2027.
- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission, the CEC, and local publicly owned utilities.
- Reorganize the Independent System Operator (ISO) to develop more regional electrified transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States.[80]

California Senate Bill 100: Renewable Portfolio Standard Program

On September 10, 2018, Governor Newsom signed SB 100, requiring California electricity utility providers to supply all in-state end users with electricity sourced from renewable or carbon-free sources by 2045. Specifically, SB 100 accelerates previously established RPS goals and requires that the program achieve 50 percent of electricity sourced from renewables by December 31, 2026, 60

[80] California Legislative Information (California Leginfo). 2015. Senate Bill 350 Clean Energy and Pollution Reduction Act of 2015. Website: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350. Accessed May 19, 2021.

percent by December 31, 2030, and 100 percent of electricity sourced from carbon-free sources by December 31, 2045. For clarification, renewable sources, as described herein, includes all renewable sources (e.g., solar, small hydro, wind) but notably omits large-scale hydroelectric and nuclear electricity generation; carbon-free sources include all renewable sources as well as large-scale hydroelectric and nuclear electricity generation.

California Assembly Bill 1493: Pavley Regulations and Fuel Efficiency Standards

California AB 1493, enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the U.S. District Court for the District of Columbia in 2011.[81]

The standards were to be phased in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards were to result in an approximately 22 percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards were to result in about a 30 percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.[82]

The second phase of the implementation for the Pavley Bill was incorporated into Amendments to the Low Emission Vehicle (LEV) Program referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules will reduce pollutants from gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid EVs and hydrogen fuel cell cars. The regulations will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.[83]

California Senate Bill 375: Sustainable Communities and Climate Protection Act

SB 375 was signed into law on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for

[81] California Air Resources Board (ARB). 2013. Clean Car Standards—Pavley, Assembly Bill 1493. Website: https://www.gsweventcenter.com/GSW_RTC_References/2015_0915_CleanAirStandards_Pavley.pdf. Accessed May 19, 2021.
[82] California Air Resources Board (ARB). 2011. Facts About the Advanced Clean Cars Program. November 9.
[83] California Air Resources Board (ARB). 2011. Status of Scoping Plan Recommended Measures.

reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

California Senate Bill 1368: Emission Performance Standards

In 2006, the State Legislature adopted SB 1368, which the Governor subsequently signed into law. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than 5 years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. Because of the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the new law effectively prevents California's utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. The California Public Utilities Commission adopted the regulations required by SB 1368 on August 29, 2007. The regulations implementing SB 1368 establish a standard for baseload generation owned by, or under long-term contract to, publicly owned utilities of 1,100 lb. CO_2 per megawatt-hour (MWh).

California Senate Bill X7-7: Water Conservation Act

This 2009 legislation directed urban retail water suppliers to set individual 2020 per capita water use targets and begin implementing conservation measures to achieve those goals. Meeting this Statewide goal of 20 percent decrease in demand would have resulted in a reduction of almost 2 million acre-feet in urban water use in 2020.

California Air Resources Board Truck and Bus Regulation

As part of the ARB's Sustainable Freight Strategy, the ARB adopted the Truck and Bus Regulation. The latest amendments to the Truck and Bus Regulation became effective on December 31, 2014. The amended regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses had to meet particulate matter (PM) filter requirements as of January 1, 2012. Lighter and older heavier trucks had to be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent.

This regulation applies to nearly all privately and federally owned diesel-fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating greater than 14,000 pounds. The regulation provides a variety of flexibility options tailored to fleets operating low use vehicles, fleets operating in selected vocations like agricultural and construction, and small fleets of three or fewer trucks.[84]

California Air Resources Board Advanced Clean Trucks Rule

To further advance the State's Sustainable Freight Strategy, the ARB adopted the Advanced Clean Trucks (ACT) Rule in July 2020, which requires manufacturers of vehicle class 2b through vehicle class

[84] California Air Resources Board (ARB). 2015. On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation. Website: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed September 22, 2017.

8 trucks to begin meeting escalating in-State ZEV sales from 2024 through 2035. By 2035, the ACT Rule will require 55 percent of trucks class 2b through class 3 to be ZEVs, 75 percent of trucks class 4 through class 8 to be ZEVs, and 40 percent of truck tractors to be ZEVs. [85] Complementary to the ACT Rule, and as discussed further below, Executive Order N-79-20 set a goal of 100 percent of all in-State drayage truck sales to be ZEVs by 2035 and 100 percent of all in-State heavy-duty vehicle sales to be ZEVs by 2045.The ARB is also in process of developing an Advanced Clean Fleet (ACF) Rule to accelerate the ACT Rule by requiring 100 percent of all in-State sales to be ZEVs in 2040 for class 2b through class 3 trucks, class 4 through class 8 vocational trucks, and class 7 through class 8 tractor trucks. The ACF Rule would also provide a clear timeline for requirements for phasing in in-State ZEV sales targets through 2040.[86]

California Code of Regulations Title 20: Appliance Efficiency Regulations

California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. Twenty-three categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the State and those designed and sold exclusively for use in recreational vehicles or other mobile equipment.

California Code of Regulations Title 24: Energy Efficiency Standards

Part 6 (Energy Efficiency Standards for Residential and Nonresidential Buildings)

California Code of Regulations Title 24 Part 6 (California's Energy Efficiency Standards for Residential and Nonresidential Buildings) was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy-efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The 2019 Building Energy Efficiency Standards went into effect on January 1, 2020.

California Code of Regulations Title 24: California Green Building Standards Code

California Code of Regulations Title 24, Part 11, is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went into effect on January 1, 2011. The Code is updated on a regular basis, with the most recent update consisting of the 2019 California Green Building Standards Code (CALGreen) that became effective January 1, 2020. Local jurisdictions are permitted to adopt more stringent requirements, as State law provides methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction ordinances and defers to them as the ruling guidance, provided that they provide a minimum 50 percent diversion requirement. The Code also provides exemptions for areas not served by construction and demolition recycling infrastructure. The State Building Code provides the minimum

[85] California Air Resources Board (ARB). 2021. Advanced Clean Trucks Fact Sheet. Website: https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-trucks-fact-sheet. Accessed April 8, 2022.

[86] California Air Resources Board (ARB). 2022. Path to Zero Emission Trucks FAQ. Website: https://ww2.arb.ca.gov/resources/documents/path-zero-emission-trucks-faq. Accessed April 8, 2022.

standard that buildings need to meet in order to be certified for occupancy, which is generally enforced by the local building official.

CALGreen (California Code of Regulations [CCR] Title 24, Part 11) requires:

- **Short-term bicycle parking**. If a commercial project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- **Long-term bicycle parking**. For buildings with over 10 tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking capacity, with a minimum of one space (5.106.4.1.2).
- **Designated parking**. Provide designated parking in commercial projects for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).
- **Recycling by Occupants**. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling (5.410.1).
- **Construction waste**. A minimum 65 percent diversion of construction and demolition waste from landfills. (5.408.1, A5.408.3.1 [nonresidential], A5.408.3.1 [residential]). All (100 percent) of trees, stumps, rocks and associated vegetation and soils resulting from land clearing shall be reused or recycled (5.408.3).
- **Wastewater reduction**. Each building shall reduce the generation of wastewater by one of the following methods:
    1. The installation of water-conserving fixtures or
    2. Using nonpotable water systems (5.303.4).
- **Water use savings**. 20 percent mandatory reduction in indoor water use with voluntary goal standards for 30, 35, and 40 percent reductions (5.303.2, A5303.2.3 [nonresidential]).
- **Water meters**. Separate water meters for buildings in excess of 50,000 square feet or buildings projected to consume more than 1,000 gallons per day (5.303.1).
- **Irrigation efficiency**. Moisture-sensing irrigation systems for larger landscaped areas (5.304.3).
- **Materials pollution control**. Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring and particleboard (5.404).
- **Building commissioning**. Mandatory inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies (5.410.2).

California Model Water Efficient Landscape Ordinance

The Model Water Efficient Landscape Ordinance (Ordinance) was required by the AB 1881 Water Conservation Act. The Ordinance required local agencies to adopt a local landscape ordinance at least as effective in conserving water as the Model Ordinance by January 1, 2010. Reductions in water use of 20 percent consistent with the SB X7-7 2020 mandate were required. Governor Brown's Drought Executive Order of April 1, 2015 (Executive Order B-29-15) directed DWR to update the Ordinance through expedited regulation. The California Water Commission approved the revised Ordinance on July 15, 2015, which became effective on December 15, 2015. New development projects that include landscaped areas of 500 square feet or more are subject to the Ordinance. The update requires:

- More efficient irrigation systems
- Incentives for graywater usage
- Improvements in on-site stormwater capture
- Limiting the portion of landscapes that can be planted with high water use plants
- Reporting requirements for local agencies.

California Public Utilities Code

The California Public Utilities Commission (CPUC) regulates privately owned telecommunication, electric, natural gas, water, railroad, rail transit, and passenger transportation companies. It is the responsibility of the CPUC to (1) assure California utility customers receive safe, reliable utility service at reasonable rates; (2) protect utility customers from fraud; and (3) promote a healthy California economy. The Public Utilities Code, adopted by the legislature, defines the jurisdiction of the CPUC.

California Executive Order B-55-18 (GHG Emissions Reduction Targets)

On September 10, 2018, former California Governor Jerry Brown issued Executive Order B-55-18, which established the following GHG emissions reduction target:

By 2045, California shall achieve carbon net neutrality.

Executive Order B-55-18 identifies that new Statewide goal is to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net neutrality emissions thereafter. This emissions goal is in addition to the existing targets established by Executive Orders S-3-05 and B-30-15 and SB 32, as described in greater detail below. This Executive Order also directs the ARB to work with other State agencies to identify and recommend measures to achieve this goal.

California Executive Order S-01-07: Low Carbon Fuel Standard

The Governor signed Executive Order S 01-07 on January 18, 2007. The order mandated that a Statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the Executive Order established an LCFS and directed the Secretary for Environmental Protection to coordinate the actions of the CEC, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "lifecycle carbon intensity" of transportation fuels.

California Executive Order N-79-20

On September 23, 2020, Governor Gavin Newsom issued Executive Order N-79-20 establishing a goal that 100 percent of new passenger cars and trucks sold in California shall be zero-emission by 2035. The Executive Order also sets a goal that, where feasible, all operations include zero-emission medium- and heavy-duty trucks by 2045, and drayage trucks by 2035. Off-road vehicles have a goal to transition to 100 percent ZEVs by 2035, where feasible. While in-state sales of EVs will increase through 2045, the State does not currently have legislation which will restrict or preclude the use of fossil-fueled vehicles by or after 2045.

California Executive Order S-13-08

Executive Order S-13-08 states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the order, the 2009 California Climate Adaptation Strategy was adopted, which is the ". . . first Statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

California Executive Order B-30-15

On April 29, 2015, the Governor issued an Executive Order to establish a California GHG emissions reduction target of 40 percent below 1990 levels by 2030. The Governor's Executive Order aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris late 2015. The Executive Order sets a new interim Statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050 and directs the ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of MMT CO_2e. The Executive Order also requires the State's climate adaptation plan to be updated every three years and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this Executive Order is not legally enforceable against local governments and the private sector. Legislation that would update AB 32 to make post 2020 targets and requirements a mandate is in process in the State Legislature.

California Senate Bill 97 and the California Environmental Quality Act Guidelines Update

Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. SB 97 states "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)."

The 2010 California Environmental Quality Act (CEQA) Amendments first guided public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The 2010 CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change. The 2010 CEQA Amendments also revised Appendix F of the CEQA Guidelines, which focuses on energy conservation, and the sample environmental checklist in Appendix G was amended to include GHG questions.

The most recent 2018 CEQA Amendments expanded upon the previous guidance by specifying that:

- The lead agency should focus its analysis on the reasonably foreseeable incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to Statewide, national, or global emissions. The agency's analysis should consider a timeframe that is appropriate for the project. The agency's analysis also must reasonably reflect evolving scientific knowledge and State regulatory schemes.
- In determining the significance of impacts, the lead agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is not cumulatively considerable.

A lead agency may use a model or methodology to estimate greenhouse gas emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision-makers to intelligently take into account the project's incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.

The 2010 changes to CEQA Guidelines Sections 15126.4 and 15130, which address mitigation measures and cumulative impacts, respectively, remained unchanged by the 2018 CEQA Amendment. The cumulative impact discussion requirement (CEQA Guidelines § 15130) simply directs agencies to analyze GHG emissions in an EIR when a project's incremental contribution of emissions may be cumulatively considerable; however, it does not answer the question of when emissions are cumulatively considerable.

Under CEQA Guidelines Section 15064.4(b), a lead agency should consider the following factors, among others, when determining the significance of impacts from GHG emissions on the environment:

(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;

(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.

(3) The extent to which the project complies with regulations or requirements adopted to implement a Statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions.

CEQA Guidelines Section 15183.5 continues to permit programmatic GHG analysis and later project-specific tiering, as well as the preparation of Greenhouse Gas Reduction Plans. Compliance with such plans can support a determination that a project's cumulative effect is not cumulatively considerable, according to Section 15183.5(b).

CEQA emphasizes that the effects of GHG emissions are cumulative and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis (see CEQA Guidelines § 15130(f)).

Center for Biological Diversity v. California Department of Fish and Wildlife (California Supreme Court GHG Ruling)

In a November 30, 2015 ruling, the California Supreme Court in *Center for Biological Diversity v. California Department of Fish and Wildlife* on the Newhall Ranch project concluded that assessing whether the project was consistent with meeting Statewide emission reduction goals is a legally permissible approach for assessing significance, but the significance finding for the project was not supported by a reasoned explanation based on substantial evidence. The Court offered potential solutions on pages 25–27 of the ruling to address this issue, as summarized below:

Specifically, the Court advised that:

- **Substantiation of Project Reductions from BAU**. A lead agency may use a BAU comparison based on the Scoping Plan's methodology if it also substantiates the reduction a particular project must achieve to comply with Statewide goals. The Court suggested a lead agency could examine the "data behind the Scoping Plan's business-as-usual model" to determine the necessary project-level reductions from new land use development at the proposed location (p. 25).
- **Compliance with Regulatory Programs or Performance Based Standards**. A lead agency "might assess consistency with AB 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce greenhouse gas emissions from particular activities. (See Final Statement of Reasons, supra, at p. 64 [greenhouse gas emissions 'may be best analyzed and mitigated at a programmatic level.'].)" To the extent a project's design features comply with or exceed the regulations outlined in the Scoping Plan and adopted by the Air Resources Board or other state agencies, a lead agency could appropriately rely on their use as showing compliance with 'performance based standards' adopted to fulfill 'a Statewide . . . plan for the reduction or mitigation of greenhouse gas emissions' (CEQA Guidelines § 15064.4(a)(2), (b)(3); see also id., § 15064(h)(3) [determination that impact is not cumulatively considerable may rest on compliance with previously adopted plans or regulations, including 'plans or regulations for the reduction of greenhouse gas emissions']) (p. 26).
- **Compliance with GHG Reduction Plans or Climate Action Plans**. A lead agency may utilize "geographically specific GHG emission reduction plans" such as climate action plans or

greenhouse gas emission reduction plans to provide a basis for the tiering or streamlining of project-level CEQA analysis (p. 26).

Compliance with Local Air District Thresholds. A lead agency may rely on "existing numerical thresholds of significance for greenhouse gas emissions" adopted by, for example, local air districts (p. 27).

Regional

Plan Bay Area 2040

As required by SB 375, the Metropolitan Transportation Commission (MTC) and Association of Bay Area Governments (ABAG) are jointly tasked with developing a Sustainable Communities Strategy (SCS) as part of its Regional Transportation Plan (RTP) development. The SCS integrates transportation, land use, and housing for the region to help the State meet its GHG legislative reduction targets. Plan Bay Area 2040 further integrates the region's SCS, RTP, and Regional Housing Need Allocation (RHNA) into a single regional plan. Plan Bay Area 2040 contains several goals for the region to attain ranging in focus from climate protection to adequate housing to open space and agricultural preservation.

Local

City of American Canyon Energy Efficiency Climate Action Plan

The proposed project is within the jurisdiction of the City of American Canyon, which has adopted an Energy Efficiency Climate Action Plan (EECAP) as discussed above in the Regulatory Framework section. The EECAP outlines a course of action to reduce community wide GHG emissions generated within the City of American Canyon. The EECAP includes two measures to reduce energy-related emissions from new nonresidential projects: (1) Participation in PG&E's Savings by Design program for nonresidential construction programs and (2) incorporation of energy efficiency improvements beyond Title 24 for new nonresidential construction. The City would impose the requirements of these measures as applicable through the project Conditions of Approval. It should be noted that the EECAP does not meet the standards required by the BAAQMD to be tiered from under CEQA Guidelines Section 15183.5.

City of American Canyon General Plan

The City of American Canyon adopted its General Plan in 1994, which contains objectives and policies that help address climate change and reduce the community's GHG emissions at the local level and improve energy efficiency and conservation. Under Resolution 2021-60, the General Plan was updated September 7, 2021, to include additional climate change and adaptation policies. The following objectives and policies from the City's General Plan are relevant to GHG emissions and energy conservation:

Objective 1.37 Consider initiatives to reduce direct and indirect greenhouse gas (GHG) emissions from transportation sources, and from new, renovated, and existing development in the City.

Policy 1.37.6 Reduce vehicle engine idling in American Canyon by educating the broader community (i.e.: businesses, commuters, residents) on the greenhouse gas impacts caused by engine idling, and implementing feasible commercial vehicle regulations.

Goal 8F Reduce consumption of nonrenewable energy sources and support the development and utilization of new energy sources.

Objective 8.22 Minimize transportation-related energy consumption.

Policy 8.22.1 Encourage the development of mixed use, pedestrian friendly employment/residential centers that help minimize vehicle trips in American Canyon and contribute to a reduction in energy consumption.

Policy 8.22.2 Encourage the clustering of residential structures.

Policy 8.22.3 Require that Development Plans provide for linkages between bicycle and pedestrian circulation systems and transit and employment centers, in accordance with established areawide plans.

Policy 8.22.4 Maintain a system of traffic signals and controls that minimizes waiting time and vehicle speed changes through routes.

Policy 8.22.5 Require that Development Plans provide for High-Occupancy Vehicles (HOV) and public transportation, where feasible, through the provision of appropriate transit areas and park-and-ride locations along public transportation routes.

Objective 8.23 Reduce Energy consumption in buildings.

Policy 8.23.1 Require that developers employ energy-efficient subdivision and site planning methods as well as building design. Measures to be considered include building orientation and shading, landscaping, building reflectance, use of active and passive solar heating and hot water system, etc. In establishing these energy related design requirements, the City shall balance energy-efficient design with good planning principles.

Policy 8.23.2 Require that new City buildings be energy efficient.

Objective 8.24 Increase public awareness of energy conservation needs and means in order to encourage informed choices about energy conservation by the general public.

Policy 8.24.1 Cooperate with local utilities to provide energy conservation information to the public.

Policy 8.24.2 Develop public and/or public-private energy conservation educational programs for City employees and the public.

Objective 8.25 Increase the energy efficiency of City operations to save energy, reduce municipal costs, and provide an example to the private sector.

Policy 8.25.1 Introduce concepts of energy efficiency and lifecycle costing to City planning and operating decisions and to the design of all major City facilities.

Policy 8.25.2 Work with other agencies and utility companies to develop safe, economical and renewable energy resources.

Policy 8.25.3 Consider participating in energy conservation demonstration projects and promoting the use of treatment technologies that provide for the reuse of waste and water treatment by products, such as sludge and methane gas.

In addition to the above General Plan policies related to GHG emissions and energy consumption, the City adopted a Climate Emergency Proclamation on November 16, 2021.

3.6.4 - Thresholds of Significance

Appendix G to the CEQA Guidelines is a sample Initial Study Checklist that includes questions for determining whether impacts related to the emissions of greenhouse gases and energy consumption are significant. These questions reflect the input of planning and environmental professionals at the Governor's Office of Planning and Research and the California Natural Resources Agency, based on input from stakeholder groups and experts in various other governmental agencies, nonprofits, and leading environmental consulting firms. They also reflect the requirements of laws other than CEQA, such as AB 32 and SB 32. As a result, many lead agencies derive their significance criteria from the questions posed in Appendix G. The City has chosen to do for this project. Thus, the proposed project would have significant effects if the project would:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (Impact GHG-1).

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases (Impact GHG-2).

c) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation (Impact GHG-3).

d) Conflict with or obstruct a State or local plan for renewable energy or energy efficiency (Impact GHG-4).

Significance Criteria

Impact GHG-1: GHG Emissions Generation

Construction

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from on-site and off-site activities. On-site GHG emissions principally consist of exhaust emissions from

heavy-duty construction equipment. Off-site GHG emissions would occur from motor vehicle exhaust from material delivery vehicles and construction worker traffic.

Neither the City of American Canyon nor the BAAQMD has an adopted threshold of significance for construction-related GHG emissions. Because construction would be temporary and would not result in a permanent increase in emissions, construction of the proposed project is presumed to not interfere with the implementation of SB 32. Nonetheless, the BAAQMD, in their 2017 CEQA Air Quality Guidelines, states that lead agencies are encouraged to incorporate Best Management Practices (BMPs) to reduce GHG emissions during construction, as feasible and applicable.

The use of GHG-reducing construction BMPs is considered by the City to be a pragmatic and effective approach for the control of construction-related GHG emissions. The BAAQMD, in their 2017 CEQA Air Quality Guidelines, specifically mention the following pragmatic and effective construction BMPs for reducing GHG emissions:

- The use of alternative fueled construction vehicles and equipment for at least 15 percent of the fleet.
- The use of local building materials for at least 10 percent of materials uses.
- The recycling and reuse of at least 50 percent of construction and demolition waste materials.

The incorporation of feasible and applicable GHG-reducing construction BMPs serves herein as the basis for whether project construction would contribute its "fair share" of GHG emission reductions consistent with the legislative reduction targets codified by SB 32 and the State's long-term climate goal of carbon neutrality by 2045, thereby resulting in a less than significant impact. As explained below in the discussion of the approach for assessing the significance of the proposed project's operational emissions, the California Supreme Court, in *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) (62 Cal.4th 204, 220-223), explained that an approach by which a lead agency ascertains a proposed project's "fair share" of required Statewide GHG reductions is a legitimate approach for formulating significance thresholds for GHG emissions. Under this approach, which here is focused on the proposed project incorporating BAAQMD-recommended BMPs for construction-related emissions, the proposed project would be considered to result in a potentially significant impact if project construction would not incorporate feasible and applicable GHG-reducing construction BMPs including, at a minimum, those listed above.

Operation

The BAAQMD is currently updating their GHG significance thresholds and is expected to adopt new significance thresholds in 2022. The BAAQMD's proposed 2022 significance thresholds for land use projects are listed below. If a land use development project cannot demonstrate consistency with Criterion A or Criterion B, then that project would result in a potentially significant impact related to GHG emissions.

A. Projects must be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).
B. Projects must include, at a minimum, the following project design elements.

a. Buildings:
    i. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development).
    ii. The project will not result in any wasteful, inefficient, or unnecessary electrical usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines.
b. Transportation:
    i. Achieve compliance with EV requirements in the most recently adopted version of CALGreen Tier 2.
    ii. Achieve a reduction in project-generated 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 SB 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:
        1. Residential projects: 15 percent below the existing VMT per capita.
        2. Office projects: 15 percent below the existing VMT per employee.
        3. Retail projects: no net increase in existing VMT.

The BAAQMD's GHG significance thresholds from their 2017 CEQA Air Quality Guidelines were established based on meeting the 2020 GHG targets set forth in the AB 32 Scoping Plan.[87] AB 32 required that Statewide GHG emissions be reduced to 1990 levels by 2020. SB 32 extended California's GHG reduction programs beyond 2020 and contains language to authorize the ARB to achieve a Statewide GHG emission reduction of at least 40 percent below 1990 levels by December 31, 2030. The ARB approved the 2017 California's Climate Change Scoping Plan update.[88] The 2017 Scoping Plan Update outlines the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels.

Because the proposed project would be constructed after 2020, the BAAQMD's GHG significance thresholds from their 2017 CEQA Air Quality Guidelines would be inappropriate to use in determining whether the proposed project could result in potentially significant impacts related to meeting the 2030 GHG emission reduction targets codified by SB 32. For land use development projects, the BAAQMD is proposing that lead agencies use one of the approaches endorsed by the California Supreme Court in *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) (62 Cal.4th 204), which evaluates a project based on its effect on California's efforts to meet the State's long-term climate goals.[89] As the Supreme Court held in that case, a project that would be consistent with meeting those goals can be found to have a less than significant impact on climate change under CEQA. This approach, endorsed by the *Center for Biological Diversity v. Department of Fish & Wildlife* (2015) court decision, evaluates whether a project's GHG emissions are cumulatively considerable based on "their effect on the state's efforts to meet [those] goals." (*Center for*

[87] California Air Resources Board (ARB). 2008. Climate Change Scoping Plan. December. Website: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed June 11, 2021.
[88] California Air Resources Board (ARB). 2017. California's 2017 Climate Change Scoping Plan. Website: https://ww2.arb.ca.gov/sites/default/files/classic//cc/scopingplan/scoping_plan_2017.pdf. Accessed June 11, 2021.
[89] Bay Area Air Quality Management District (BAAQMD). 2022. Draft Justification Report: CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans. February. Website: https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/~/media/ffb719cfa04a438d9c7be10007a5abdf.ashx. Accessed April 4, 2022.

Biological Diversity v. Department of Fish & Wildlife [2015] 62 Cal.4th at p. 221.) If a project would contribute its "fair share" of what will be required to achieve those long-term climate goals, then a reviewing agency can find that the impact would not be significant because the project will help to solve the problem of global climate change (62 Cal.4th at pp. 220-223).

If a new land use project would serve California's pressing need to provide housing, jobs, and related infrastructure in a manner that supports achieving those climate goals, then the project would help to solve the climate change problem, and its GHG emissions should not be treated as cumulatively considerable. As the Supreme Court held, "consistency with meeting [those] Statewide goals [is] a permissible significance criterion for project emissions" (*Center for Biological Diversity v. Department of Fish & Wildlife* [2015] 62 Cal.4th at p. 220), and an agency's "choice to use that criterion does not violate CEQA" (*Center for Biological Diversity v. Department of Fish & Wildlife* [2015] 62 Cal.4th at p. 223). This approach is based on the principle inherent in CEQA that an individual project would make a less than cumulatively considerable contribution if it would do its part to address the cumulative problem. As the Supreme Court explained, "if a plan is in place to address a cumulatively problem, a new project's incremental addition to the problem will not be 'cumulatively considerable' if it is consistent with the plan and is doing its fair share to achieve the plan's goals" (*Center for Biological Diversity v. Department of Fish & Wildlife* [2015] 62 Cal.4th at p. 223). Given that the problem is the result of such numerous and diverse emission sources, no individual project needs to or could solve the entire cumulative problem by itself. However, each individual project does need to do what is required of it to ensure that the overall solution is implemented, and if it does that, then its impacts on climate change can be treated as less than cumulatively considerable. As the Supreme Court put it in the climate context, "[t]o the extent a project incorporates efficiency and conservation measures sufficient to contribute its portion of the overall greenhouse gas reductions necessary [to achieve the State's climate goals], one can reasonably argue that the project's impact is not cumulatively considerable, because it is helping to solve the cumulative problem" (*Center for Biological Diversity v. Department of Fish & Wildlife* [2015] 62 Cal.4th at p. 220).

The *Center for Biological Diversity v. Department of Fish & Wildlife* court case was decided in 2015, and it specifically addressed only the AB 32 goal of attaining 1990 emission levels by 2020 Statewide, not the longer-term goal for carbon neutrality in 2045. However, it is now past the 2020 goal horizon and the focus of State climate legislation and Statewide and local reduction targets have since shifted to longer-term goals. The Supreme Court has recognized the necessity and appropriateness of using these longer-term goals as the basis for the CEQA analysis. As it held in *Cleveland National Forest Foundation v. SANDAG*, these longer-term goals express "what scientific research has determined to be the level of emissions reductions necessary to stabilize the climate by midcentury and thereby avoid catastrophic effects of climate change" (*Cleveland National Forest Foundation v. SANDAG* [2017] 3 Cal.5th 497, 513).[90]

Although the 2045 carbon neutrality goal is set forth in an Executive Order and not in a statute, as with the 2020 AB 32 goal that the Supreme Court addressed in *Center for Biological Diversity*, the Executive Order B-55-18 goal is appropriate to use for developing a threshold of significance given

[90] These statements were referring to Executive Order S-3-05, which included an 80 percent reduction target by 2050, but they equally apply to the more recent Executive Order B-55-18, which includes a carbon neutrality target by 2045.

the science supporting it. The Supreme Court explicitly rejected the argument that an Executive Order cannot be used for this purpose because it has not been adopted by statute in the *SANDAG* case. The Court explained that the Executive Order at issue there "expresses the pace and magnitude of reduction efforts that the scientific community believes is necessary to stabilize the climate. This scientific information has important value to policymakers and citizens in considering the emission impacts of a project" (*Cleveland National Forest Foundation v. SANDAG* [2017] 3 Cal.5th at p. 515). Agencies are required to design their CEQA analyses "based to the extent possible on scientific and factual data," and if an Executive Order best embodies the current state of the scientific and factual data, an agency may use it as the basis for its CEQA analysis (*Cleveland National Forest Foundation v. SANDAG* [2017] 3 Cal.5th at p. 515).

In developing the their proposed 2022 GHG significance thresholds, the BAAQMD analyzed what will be required of new land use development projects to achieve California's long-term climate goal of carbon neutrality by 2045, thereby better representing what design elements new land use development projects need to incorporate to sufficiently contribute to achieving the State's goal of carbon neutrality by 2045. As GHG emissions from the land use sector come primarily from building energy use and from transportation, these are the areas that need to be evaluated to determine whether the project can or will be carbon neutral. With respect to building energy use, this can be achieved by replacing natural gas with electric power and by eliminating inefficient or wasteful electricity usage. These strategies will support California's transition away from fossil fuel-based energy sources and will bring the project's GHG emissions associated with building energy use down to zero as SB 100 incrementally requires greater and greater proportions of in-state sales of electricity are generated from renewable and carbon-free sources, ultimately requiring 100 percent of in-state electricity sales to be generated from carbon-free sources by 2045. With respect to transportation, projects need to be designed to reduce project-generated VMT and to provide sufficient EV charging infrastructure to support the adoption of EVs.

As illustrated above in the BAAQMD's proposed 2022 GHG significance thresholds, the draft BAAQMD document recommends that residential and office projects use a threshold of a 15 percent reduction in project-generated VMT per capita compared with existing levels (or other, more current percentage to the extent further analysis shows that a different level of reduction is needed) and providing EV charging infrastructure as specified in the CALGreen Tier 2 standards. If a land use project being designed and built today incorporates the design elements necessary for the project to be carbon neutral by 2045, then it will contribute its "fair share" to achieving the State's climate goals, resulting in a less than cumulatively considerable climate impact. Therefore, the proposed 2022 GHG significance thresholds will be utilized to determine whether the proposed project would result in potentially significant impacts related to GHG emissions. Please refer to a copy of the BAAQMD's *Draft Justification Report: CEQA Thresholds for Evaluating the Significance of Climate Impacts From Land Use Projects and Plans* contained in Appendix B for more information supporting the use of these GHG significance thresholds.

Although the BAAQMD has not yet formally adopted these thresholds, the City of American Canyon exercises its discretion as the CEQA lead agency to embrace and adopt the BAAQMD's draft approach, with minor refinements, as being reflective of what the City considers to be the best current thinking on the subject. As the Supreme Court said in (*Center for Biological Diversity v.*

Department of Fish & Wildlife [2015] 62 Cal.4th at p. 228), "[a] lead agency enjoys substantial discretion in its choice of methodology."

The refinements made by the City relate to the manner of dealing with VMT. The BAAQMD proposal does not specify what level of VMT reduction, vis-à-vis a regional average, should be used for an *industrial* project such as the proposed project. Rather, BAAQMD is silent on this subject. The City therefore had to consider how to address this particular issue. One option was to consider the approach that BAAQMD is considering with respect to retail projects: to assess whether such projects will result in a *net increase* in existing VMT. A second option was to consider BAAQMD's approach with respect to residential projects: to assess whether such projects will result in 15 percent below the existing regional VMT per capita. And a third option was to consider BAAQMD's approach with respect to office projects: to assess whether such projects will result in VMT 15 percent below the existing VMT per employee.

Because industrial projects more closely resemble office projects than residential projects, and because the BAAQMD approach for office projects is more conservative than the approach for retail projects, the City has conservatively determined that it should use the BAAQMD's proposed approach used for office projects: 15 percent below the existing VMT per employee.

BAAQMD's silence on the issue of how to address VMT with respect to industrial projects is not the only example of a lack of guidance on this subject from expert regulatory agencies. Neither CEQA Guidelines Section 15064.3 nor the 2018 *Technical Advisory on Evaluating Transportation Impact in CEQA* published by the Governor's Office of Planning and Research (OPR) provides specific guidance related to industrial land uses. As with the proposed BAAQMD thresholds, OPR's Technical Advisory provides guidance relative to VMT significance criteria for residential, office, and retail uses but does not address industrial land uses.

The majority of trips generated by industrial land uses are typically attributed to employees and heavy-duty vehicles used to transport commercial goods. CEQA Guidelines Section 15064.3(a) states that VMT refers to the amount and distance of *automobile* travel attributable to a project (italics added). The OPR Technical Advisory states that the term "automobile," as used in Section 15064.3(a), refers to on-road passenger vehicles, specifically cars and light trucks; heavy vehicles are not included in the definition.

The legislature's stated intent in abandoning level of service as a metric for transportation-related impacts, as set forth in Public Resources Code Section 21099(b)(1), was to promote the reduction of GHG emissions, the development of multimodal transportation networks, and a diversity of land uses. The GHG emissions of trips associated with heavy vehicles serving industrial uses are addressed through the implementation of Statewide programs such as the ARB's Sustainable Freight Strategy, which through regulations such as the Truck and Bus Regulation and ACT Regulation will transition a larger and larger portion of heavy-duty trucks operating within California to be electric through 2050. Additionally, heavy-duty vehicle trips associated with industrial land uses would occur regardless of the available modes of transportation (e.g., walking, bicycling, public transit) or the mix of land uses in the project vicinity. Therefore, limiting the VMT analysis to employee automobile travel is consistent with State policy to reduce GHG emissions from land use decisions and the

availability of alternatives to automobile travel. For these reasons, the City has determined that it is appropriate to employ a VMT metric for GHG analysis based on the proposed BAAQMD approach for office land uses, namely, one focused on employee VMT.

Impact GHG-2: GHG Emissions Reduction Plan Consistency

While the above methodology is employed under Impact GHG-1, which focuses on the proposed project's direct and indirect generation of GHG emissions, Impact GHG-2 methodology for determining whether a potentially significance impact would occur focuses on the proposed project's consistency with the applicable plan adopted for the purpose of reducing GHG emissions. Consistent with the BAAQMD's CEQA Air Quality Guidelines, for this impact to be less than significant, the proposed project must demonstrate consistency with the applicable GHG emissions reduction plan. As such, the proposed project would be determined to conflict with the applicable GHG emissions reduction plan if it would not adhere to applicable GHG reduction measures and policies included in the City's General Plan and EECAP, the MTC/ABAG Plan Bay Area 2050, and the ARB's 2017 Scoping Plan.

Impact GHG-3: Wasteful, Inefficient, or Unnecessary Energy Consumption

The methodology employed under Impact GHG-3, which focuses on determining whether the proposed project would result in the wasteful, inefficient, or unnecessary consumption of energy resources, follows the guidance provided in Appendix F of the CEQA Guidelines as well as the analytical precedent set by *League to Save Lake Tahoe Mountain etc. v. County of Placer* (2022) 75 Cal.App.5th 63, 164-168).

According to Appendix F of the CEQA Guidelines, the goal of conserving energy is translated to include decreasing overall per capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas, and oil; and increasing reliance on renewable energy sources. In *League to Save Lake Tahoe Mountain etc. v. County of Placer* (2022) 75 Cal.App.5th at pp. 164-168), the Appellate Court concluded that the analysis of wasteful, inefficient, and unnecessary energy consumption was not adequate because it did not consider whether additional renewable energy features can be added to the project.

The proposed project would be considered to result in a potentially significant impact if it would result in wasteful, inefficient, or unnecessary consumption of energy resources. Considering the guidance provided by Appendix F of the CEQA Guidelines and the Appellate Court decision in *League to Save Lake Tahoe Mountain etc. v. County of Placer* (2022) 75 Cal.App.5th at pp. 164-168, the proposed project would be considered to result in wasteful, inefficient, or unnecessary consumption of energy resources if it would conflict with the following energy conservation goals:

- Decreasing overall per capita energy consumption;
- Decreasing reliance on fossil fuels such as coal, natural gas, or oil; and
- Increasing reliance on renewable energy sources.

Impact GHG-4: Renewable Energy and Energy Efficiency Plan Consistency

Similar to the impact discussion under Impact GHG-2, this impact discussion focuses on project consistency with a local plan or policy adopted for the purpose of improving energy efficiency or reliance on renewable energy sources. The impact discussion under Impact GHG-2 differs from this impact discussion in that Impact GHG-2 explores project consistency with relevant policies intended to reduce GHG emissions, which often encompass energy efficiency and renewable energy measures. Impact GHG-4, by contrast, focuses on project consistency with relevant policies intended to improve energy efficiency and encourage the use of renewable energy sources. Therefore, while both Impact GHG-2 and Impact GHG-4 will discuss project consistency with the City's General Plan and EECAP, Impact GHG-4 focuses solely on policies applicable to energy consumption. As such, the proposed project would be determined to conflict with the applicable energy efficiency or renewable energy plan if it would not adhere to applicable energy consumption related measures included in the City's General Plan and EECAP.

Approach to the Analysis

The California Emissions Estimator Model (CalEEMod) Version 2020.4.0 was developed in collaboration with the South Coast Air Quality Management District and other air districts throughout the State. CalEEMod is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential GHG emissions associated with construction and operation from various land uses. The modeling used to support this analysis follows BAAQMD guidance where applicable from its CEQA Air Quality Guidelines.

At the time of this analysis, the construction of Phase 1 of the proposed project was anticipated to begin in early 2022 and be completed 10 months later. Construction of Phase 2 of the proposed project was expected to begin immediately following the completion of Phase 1 construction and be completed 10 months later. In general, this analysis also included estimated project trip generation and trip length provided by W-Trans (Appendix H). As the proposed project is a speculative warehouse development which could accommodate cold storage and accompanying Transport Refrigeration Units (TRU), this analysis considers two project scenarios: a cold warehouse project scenario and a dry warehouse project scenario. Where appropriate, both project scenarios are presented herein to determine project impacts.

Construction-Related GHG Emissions

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from both on-site and off-site activities. On-site emissions consist of exhaust emissions from the activity levels of heavy-duty construction equipment and motor vehicle operation. Off-site emissions result from motor vehicle exhaust from hauling and vendor trucks and worker traffic.

Construction emissions are generally calculated as the product of an activity factor and an emission factor. The activity factor for construction equipment is a measure of how active a piece of equipment is and can be represented as the amount of material processed, elapsed time that a piece of equipment is in operation, horsepower of a piece of equipment used, or the amount of fuel consumed in a given amount of time. The emission factor relates the process activity to the amount

of pollutant emitted. Examples of emission factors include grams of emissions per VMT and grams of emissions per horsepower-hour. The operation of a piece of equipment is tempered by its load factor, which is the average power of a given piece of equipment while in operation compared with its maximum rated horsepower. A load factor of 1.0 indicates that a piece of equipment continually operates at its maximum operating capacity. This analysis uses the CalEEMod default load factors for off-road equipment.

Operation-Related GHG Emissions

The operational-phase emissions are based on the development of the proposed industrial park. The modeling accounts for the average daily vehicle and truck trips and VMT, energy usage, water demand, and wastewater and solid waste generation. For purposes of this analysis, hours of operation for the proposed project are 24 hours per day, 7 days per week.

Transportation

On-road transportation sources are based on passenger vehicle and truck trip generation rates and VMT provided in the Traffic Impact Study (TIS) prepared by W-Trans for the proposed project (see Appendix H). According to the VMT information provided therein, which is based on regional demographic information, the proposed project would result in an average employee daily VMT of 16.24 miles. Please refer to the TIS in Appendix H for more information regarding the methodology behind determining the proposed project's average employee daily VMT. As this VMT would represent all travel to and from the project site for employees in addition to any other destinations those employees will travel to and from each day, an average of 8.12 miles per one-way vehicle trip was conservatively utilized in this analysis to estimate associated emissions from employee passenger vehicle activity. However, as provided in the TIS, the proposed project would also generate truck traffic for deliveries and shipments. As indicated by the project applicant, the most likely port of origin for freight deliveries and shipments would be the Port of Oakland, approximately 32.8 miles from the project site. Therefore, truck travel distances utilized in emission estimates contained in this analysis were assumed to be 32.8 miles per trip.

Furthermore, the proposed project would include locomotive operations beginning with operation of Phase 1. The quantity and frequency of rail shipments to the project site are currently unknown; therefore, various assumptions are utilized in this analysis to characterize future operations. For instance, according to the United States Bureau of Transportation Statistics, the average weight of a loaded railcar ranges from 63 to 67 tons;[91] therefore, for the purposes of this analysis, a loaded railcar being shipped to the proposed project is assumed to weigh 65 tons on average. Assuming an average travel distance of 50 miles and an average loaded railcar weight of 65 tons,[92] this would represent nearly two loaded, 20-railcar locomotive deliveries per week. Please refer to the locomotive emissions estimations contained in Appendix B for more details.

[91] United States Bureau of Transportation Statistics. 2012. Railcar Weights. Website: https://www.bts.gov/archive/publications/transportation_statistics_annual_report/2003/chapter_02/railcar_weights#:~:text=The%20average%20weight%20of%20a,trends%20among%20selected%20freight%20commodities. Accessed July 29, 2021.

[92] United States Department of Transportation, Bureau of Transportation Statistics. 2012. Railcar Weights. Website: https://www.bts.gov/archive/publications/transportation_statistics_annual_report/2003/chapter_02/railcar_weights#:~:text=The%20average%20weight%20of%20a,trends%20among%20selected%20freight%20commodities. Accessed August 2, 2021.

CalEEMod, Version 2020.4.0 was used to quantify passenger vehicle emissions using vehicle emission rates based on vehicle emissions data obtained from the ARB's EMFAC2017 Version 1.0.3 web database and adjusted based on methodology provided in Appendix B of the CalEEMod User's Guide.[93] The passenger vehicle trips were assumed to be distributed among the light-duty auto (LDA), light-duty truck 1 (LDT1), light-duty truck 2 (LDT2), and medium-duty vehicle (MDV) EMFAC2007 vehicle categories proportional to that respective vehicle category's share between those four passenger vehicle categories within the CalEEMod for Napa County.

Truck and TRU emissions were calculated utilizing the ARB's EMFAC2017 Version 1.0.3 and OFFROAD web databases, respectively, and adjusted based on methodology provided in Appendix B. Please refer to the fleet mix adjustment calculations contained in Appendix B for more details.

Other Operational Emissions

Solid Waste Disposal

Indirect emissions from waste generation are based on the CalEEMod default solid waste generation rates, which are based on data from the California Department of Resources, Recycling, and Recovery (CalRecycle).

Water/Wastewater

GHG emissions from this sector are associated with the embodied energy used to supply water, treat water, distribute water, and then treat wastewater and fugitive GHG emissions from wastewater treatment. Indoor water consumption is based on CalEEMod default indoor water use rates.

Area Sources

Area sources are based on the CalEEMod defaults for use of consumer products and landscaping equipment.

Energy

Emissions from this sector are from use of natural gas for space and water heating and electricity use for lighting and power needs at the proposed buildings.

Stationary Sources

Stationary sources are based on the anticipated stationary source equipment included in the proposed project. Given the type and size of the proposed project, the project applicant anticipates the use of a back-up diesel generator and diesel-fueled fire pump for each of the proposed buildings; however, the exact specifications for this equipment are unknown at the time of this analysis. To account for potential operational emissions generated from the non-emergency use of this equipment, the proposed project was assumed to include three back-up diesel generators and three diesel-fueled fire pumps, each assumed to be rated at 50 horsepower and operate for a 4-hour maintenance period one day per month, totaling an estimated 48 hours of operation per year.

[93] California Air Pollution Control Officers Association (CAPCOA). 2017. California Emissions Estimator Model (CalEEMod). Version 2020.4.0 Prepared by: BREEZE Software, A Division of Trinity Consultants in collaboration with South Coast Air Quality Management District and the California Air Districts.

3.6.5 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the project and provides mitigation measures where necessary.

Greenhouse Gas Emissions

Impact GHG-1:	**The proposed project would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.**

Impact Analysis

Both construction and operational activities have the potential to generate GHG emissions. The proposed project would generate GHG emissions during temporary (short-term) construction activities such as site grading, operation of construction equipment, operation of on-site heavy-duty construction vehicles, hauling of materials to and from the project site, asphalt paving, and construction worker vehicle trips. On-site construction activities would vary depending on the level of construction activity.

Long-term, operational GHG emissions would result from project-generated vehicular traffic, operation of any landscaping equipment, off-site generation of electrical power over the life of the proposed project, the energy required to convey water to and wastewater from the project site, the emissions associated with the hauling and disposal of solid waste from the project site, any fugitive refrigerants from air conditioning or refrigerators, and the operation of any proposed stationary sources such as back-up generators or fire pumps.

Global climate change is not confined to a particular project area and is generally accepted as the consequence of global industrialization over the last 200 years. A typical project, even a very large one, does not generate enough GHG emissions on its own to influence global climate change significantly; hence, the issue of global climate change is, by definition, a cumulative environmental impact. Therefore, this section measures the proposed project's incremental contribution to the cumulative environmental impact. The following is a discussion of the proposed project's contribution to GHG emissions during both the construction and operation phases.

Construction

As previously discussed, neither the City nor the BAAQMD has thresholds of significance for construction-related GHG emissions; therefore, the incorporation of feasible and applicable GHG-reducing construction BMPs, including but not limited to those listed above, serves herein as the basis for whether project construction would contribute its "fair share" of GHG emission reductions consistent with the legislative reduction targets codified by SB 32 and the State's long-term climate goal of carbon neutrality by 2045. As such, the proposed project would be considered to result in a potentially significant impact if project construction would *not* incorporate feasible and applicable GHG-reducing construction BMPs including those recommended by the BAAQMD. The BAAQMD-recommended GHG-reducing construction BMPs are listed below:

- The use of alternative fueled construction vehicles and equipment for at least 15 percent of the fleet.

- The use of local building materials for at least 10 percent of materials uses.
- The recycling and reuse of at least 50 percent of construction and demolition waste materials.

The proposed project's Phase 1 and Phase 2 construction emissions for both dry and cold storage project scenarios are shown in Table 3.6-3. It should be noted that the analysis conservatively assumes that construction would start in January 2022. As vehicle and equipment fuel efficiencies and emission control standards continue to incrementally improve with each year, project construction emissions are likely to decrease nominally from what is shown in Table 3.6-3 should the construction schedule move to later years. Therefore, the construction GHG emissions contained in Table 3.6-3 represent a conservative assessment of project construction emissions.

Table 3.6-3: Construction Greenhouse Gas Emissions

Construction Activity	Calendar Year	Dry Storage Scenario MT CO_2e	Cold Storage Scenario MT CO_2e
Project Phase 1			
Site Preparation	2022	3	3
Grading	2022	70	70
Building Construction[1]	2022	1,591	1,606
Paving	2022	12	12
Architectural Coating	2022	8	8
Project Phase 2			
Site Preparation	2022	3	3
Grading	2022	48	48
Building Construction	2022	294	294
Total 2022 Construction Emissions		**2,029**	**2,044**
Building Construction[1]	2023	1,690	1,705
Paving	2023	13	13
Architectural Coating	2023	11	11
Total 2023 Construction Emissions		**1,714**	**1,729**

Notes:
MT CO_2e = metric tons of carbon dioxide equivalent
Emission estimates shown above incorporate implementation of Mitigation Measure (MM) AIR-2a and MM AIR-2b.
[1] Cold Storage Scenario Building Construction emission estimates include fugitive refrigerants during the installation of the anticipated refrigeration system.
Source: CalEEMod Output (Appendix B).

As shown above in Table 3.6-3, construction of the proposed project would result in an estimated 2,029 MT CO_2e under a dry storage scenario and 2,044 MT CO_2e under a cold storage scenario in the first analyzed construction year of 2022. Also illustrated above, construction of the proposed project would result in an estimated 1,714 MT CO_2e under a dry storage scenario and 1,729 MT CO_2e under

a cold storage scenario in the second analyzed construction year of 2023. Nonetheless, the proposed project would need to incorporate GHG-reducing construction BMPs for construction impacts to be considered less than significant, including the use of alternative fueled construction vehicles and equipment, the use of local building materials, and the recycling and reuse of construction and demolition waste. As the proposed project would not explicitly incorporate GHG-reducing construction BMPs, such as those listed above, the proposed project would be required to implement MM GHG-1a to reduce construction GHG emissions through the implementation of GHG-reducing BMPs.

Moreover, the primary source for GHG emission generation during construction activities consists of the anticipated construction equipment included in the modeling to support the estimated emissions contained in Table 3.6-3. As GHG emission generation from off-road construction equipment is generally correlated with fuel consumption, the proposed project would be required to utilize alternatively fueled or electric construction equipment as a principal component of MM GHG-1a to reduce construction-generated GHG emissions. Therefore, MM GHG-1a would mandate the use of electric and alternatively fueled equipment for at least 15 percent of the construction fleet, the use of local building materials and contractors for at least 10 percent of all building materials used, and the recycling and reuse of at least 65 percent of construction and demolition waste generated during project construction, consistent with the current CALGreen model construction and demolition waste diversion requirement (see CALGreen Sections 4.408 and 5.408). MM GHG-1a would also require the proposed project to incorporate a variety of feasible and applicable GHG-reducing construction BMPs, such as utilizing local contractors and implementing idling restrictions, in addition to those recommended by the BAAQMD to maximize the potential reduction in construction GHG emissions. MM GHG-1a notably has more construction BMPs than those recommended by the BAAQMD. The project applicant has identified these additional construction BMPs as feasible and applicable means to maximize GHG emission reductions during project construction; therefore, MM GHG-1a incorporates additional BMPs beyond those recommended by the BAAQMD to further the proposed project's contribution to its "fair share" in GHG emission reductions during construction toward the State's long-term climate goal of carbon neutrality by 2045.

In addition, as shown in Table 3.6-3, project construction could generate up to 2,044 MT CO_2e per year during project construction before mitigation, or a potential total of 3,773 MT CO_2e for total project construction before mitigation. As shown in Table 3.6-4 and discussed further below, project operation could generate up to 21,360 MT CO_2e per year before mitigation targeting GHG emissions. As is customary in GHG emissions analyses, emissions are analyzed over an assumed lifetime of the proposed project. Considering a 30-year lifetime of project operations, construction GHG emissions amortized over 30 years would equate to an estimated 126 MT CO_2e per year, constituting approximately 0.6 percent of annual project GHG emissions. As project construction would constitute a small proportion of overall project GHG emissions, and with the incorporation of feasible and applicable GHG-reducing construction BMPs, the proposed project is considered to contribute its "fair share" of GHG emission reductions during construction consistent with the legislative reduction targets codified by SB 32 and the State's long-term climate goal of carbon neutrality by 2045. Therefore, with the implementation of MM GHG-1a, project construction impacts would be less than significant with mitigation.

Operation

The proposed project would contribute to global climate change through direct and indirect emissions of GHGs from mobile sources (e.g., passenger vehicles, trucks, locomotives), energy (e.g., on-site natural gas consumption and purchased electricity), water use and wastewater generation, and solid waste generation. All modeling parameters utilized in the Air Quality analysis are also utilized for this GHG analysis, including but not limited to trip generation rates, trip distances, building sizes and operations, energy consumption, water consumption, and waste generation. Please refer to Appendix B for modeling results and detailed calculations.

The GHG emissions associated with full operation of the proposed project for operational years 2023 and 2030 are shown in Table 3.6-4, which incorporates implementation of MMs AIR-2c and AIR-2d. Under a dry storage scenario, the proposed project is estimated to generate approximately 18,266 MT CO_2e/year starting in 2023. Under a cold storage scenario, the proposed project is estimated to generate approximately 21,360 MT CO_2e/year starting.

Table 3.6-4: Operational GHG Emissions

Source	Dry Storage Scenario	Cold Storage Scenario
	Year 2023	
	MT CO_2e/year	
Area	0	0
Fugitive Refrigerants	–	903
Energy–Electricity	895	2,292
Energy–Natural Gas	443	487
Mobile–Passenger Vehicles	2,517	2,517
Mobile–Trucks	13,175	13,175
Mobile–Locomotives	66	66
Mobile–TRUs	–	751
Waste	677	677
Water	493	493
Totals	**18,266**	**21,360**

Notes:
BAAQMD = Bay Area Air Quality Management District
CO_2e = carbon dioxide equivalent
MT = metric tons
TRU = Transport Refrigeration Unit
Manual summation of the sources may not equal to the Total due to rounding. Emission estimates shown above incorporate implementation of MM AIR-2c and MM AIR-2d.
Source: CalEEMod Version 2020.4.0; Appendix B.

As previously discussed, the BAAQMD's proposed 2022 GHG significance thresholds represent a method for determining whether the proposed project would be cumulatively considerable or

whether the proposed project contributes to solving the cumulative problem of climate change, taking into consideration the State's long-term climate goal of carbon neutrality by 2045. As such, the BAAQMD's proposed 2022 GHG significance thresholds reflect California's current short-term climate goal of reducing Statewide emissions by 40 percent below 1990 levels by 2030 as well as California's long-term climate goal of achieving carbon neutrality by 2045. Therefore, the proposed project is analyzed herein against the BAAQMD's proposed 2022 GHG significance thresholds to determine whether potentially significant impacts related to GHG emissions would occur.

As previously discussed, the BAAQMD's proposed 2022 GHG significance thresholds identifies two pathways for determining consistency with the State's climate goals: demonstrating project consistency with a qualified GHG reduction strategy under CEQA Section 15183.5(b), or ensuring that the proposed project incorporates design and operational features that support the region and State's adoption of EVs, facilitate reductions in project-generated VMT, and preclude the use of legacy emission sources such as natural gas. The BAAQMD's proposed 2022 GHG significance thresholds for land use projects are listed below. As noted above, the City has modified them only as necessary to address VMT from industrial projects, a subject on which the BAAQMD was silent. If the proposed project cannot demonstrate consistency with Criterion A or Criterion B, then the proposed project would result in a potentially significant impact related to GHG emissions.

A. Projects must be consistent with a local GHG reduction strategy that meets the criteria under State CEQA Guidelines Section 15183.5(b).
B. Projects must include, at a minimum, the following project design elements.
    a. Buildings:
        i. The project will not include natural gas appliances or natural gas plumbing (in both residential and nonresidential development).
        ii. The project will not result in any wasteful, inefficient, or unnecessary electrical usage as determined by the analysis required under CEQA Section 21100(b)(3) and Section 15126.2(b) of the State CEQA Guidelines.
    b. Transportation:
        i. Achieve compliance with EV requirements in the most recently adopted version of CALGreen Tier 2.
        ii. Achieve a reduction in project-generated 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 SB 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:
            1. Residential projects: 15 percent below the existing VMT per capita.
            2. Office projects: 15 percent below the existing VMT per employee.
            3. Retail projects: no net increase in existing VMT.

Criterion A

As previously mentioned, the City's EECAP does not meet the requirements to be considered a qualified GHG reduction strategy capable of being tiered from under CEQA Guidelines Section 15183.5(b). Therefore, the proposed project is not capable of satisfying Criterion B from the above

2022 GHG significance thresholds and must demonstrate consistency with the provisions of Criterion A to determine a less than significant impact related to GHG emissions. As illustrated above, Criterion A contains four notable provisions, against which the proposed project is analyzed herein.

Criterion B

Natural Gas Prohibition Provision

The first provision requires that the proposed project not include natural gas plumbing and instead relies on electricity as the primary building energy source. As the proposed project's design does not specifically include the prohibition of natural gas plumbing, MM GHG-1b would be required to ensure that no natural gas plumbing be built into the design of the proposed project.

It should be noted that the emission estimates contained in Table 3.6-4 do not reflect the prohibition of natural gas plumbing and conservatively includes GHG emissions generated from the on-site combustion of natural gas for space and water heating. As shown therein, the proposed project could generate up to 443 MT CO2e per year under a dry storage scenario or up to 487 MT CO2e per year under a cold storage scenario if future tenants require natural gas for critical operations. The proposed project would be compliant with this provision with the incorporation of MM GHG-1b.

Wasteful, Inefficient, or Unnecessary Electricity Consumption Provision

The second provision of the BAAQMD's proposed 2022 GHG significance thresholds requires that electricity consumption would not be considered wasteful, inefficient, or unnecessary. As discussed in greater detail under Impact GHG-3, the proposed project would not result in the wasteful, inefficient, or unnecessary consumption of energy resources. However, this provision specifically refers to electricity consumption as opposed to the consumption of general energy resources. The proposed project would be required to be constructed compliant with the California Building Code Title 24 requirements, which requires that new buildings be designed to accommodate future rooftop solar systems among other energy conservation and energy efficiency standards. As such, the proposed project would be designed to accommodate the future use of on-site renewable energy and would not by design preclude the use of EVs or renewable energy sources. Moreover, MM GHG-1b would require the proposed project to prohibit the use of natural gas during project operation, thereby reducing project dependence on fossil fuels and removing legacy GHG emission sources in contributing to achieving the State's long-term climate goal of carbon neutrality by 2045.

Nonetheless, the proposed project could consume up to an estimated 24,495,402 kWh electricity per year during operation, as discussed in greater detail under Impact GHG-3, and the proposed buildings would be constructed to at least the minimum energy efficiency standards contained in the California Building Code. Moreover, until California's electricity grid is 100 percent generated from renewable and carbon-free sources in 2045, the proposed project's electricity consumption would result in additional demand of fossil fuel resources for electricity generation. As such, MM GHG-1c would be required to increase the energy efficient standards met for the proposed buildings, thereby minimizing the potentially wasteful, inefficient, or unnecessary consumption of electricity, and MM GHG-1d would be required to reduce project reliance on fossil fuels for electricity consumption until the State's electricity grid achieves 100 percent carbon-free status in 2045 under SB 100. MM GHG-1c would require the proposed buildings to be designed and built to meet the Tier 2 energy

efficiency requirements of the Nonresidential Voluntary Measures of the California Building Code, and MM GHG-1d would require the proposed project to source its electricity consumption from 100 percent carbon-free sources. Therefore, after incorporation of MM GHG-1c and MM GHG-1d, the proposed project's design would not result in building electricity consumption that is wasteful, inefficient, or unnecessary.

Electric Vehicle Charging Infrastructure Provision

The third provision of the BAAQMD's proposed 2022 GHG significance thresholds requires that the proposed project achieve compliance with the EV charging infrastructure standards contained in the Tier 2 requirements of CALGreen. Because the proposed project does not currently involve a site design which demonstrates compliance with the Tier 2 requirements of CALGreen's EV charging infrastructure standards, MM GHG-1e would be required to ensure project compliance with this provision. MM GHG-1e would require that the proposed parking areas are designed and will be built to accommodate EV charging stations. At a minimum, the parking shall be designed to accommodate a number of EV charging stations equal to the Tier 2 Nonresidential Voluntary Measures of the California Green Building Standards Code, Section A5.106.5.3.2. Considering that trucking activities constitute a major operational activity for the proposed project, the Tier 2 EV charging infrastructure requirements contained in MM GHG-1e would apply to both passenger automobiles as well as trucks. Loading docks would also be required under MM GHG-1e to contain 240-volt outlets to accommodate EV and TRU charging while trucks are loading or unloading goods. The inclusion of MM GHG-1e would ensure that the proposed project meets the provision requiring compliance with the Tier 2 EV charging infrastructure of CALGreen. MM GHG-1e would also further reduce the potential for the wasteful, inefficient, or unnecessary consumption of energy resources from automobiles by supporting the region and State's adoption of EVs and reducing reliance on fossil fuels. Therefore, with incorporation of MM GHG-1e, the proposed project would be compliant with this provision.

Vehicle Miles Traveled Provision

Lastly, the fourth provision of the BAAQMD's proposed 2022 GHG significance thresholds requires a 15 percent decrease below existing VMT per capita for residential projects, a 15 percent decrease below existing VMT per employee for office projects, and a no net increase in existing VMT for retail projects. As the proposed project would be a logistics center, none of these VMT reduction requirements directly apply. As explained above, the City has therefore chosen to formulate a VMT formula specific to industrial uses—15 percent below existing regional average for employees. With this project-specific formula/threshold in mind, the TIS prepared by W-Trans for the proposed project.[94] The study found that the proposed project's employees would see a roughly 29 percent reduction in VMT when compared to existing regional VMT. As discussed therein, the region's existing average daily employee VMT is 23 miles while the proposed project's employee VMT would be 16.24 miles. Therefore, the proposed project's employee-generated VMT would conform to the 15 percent reduction requirement formulated by the City based on similar provisions of the BAAQMD's proposed 2022 GHG significance thresholds. Moreover, the State's overarching GHG reduction strategy for the transportation sector for medium and heavy-duty trucks focuses on

[94] W-Trans. 2021. Traffic Impact Study for the Giovannoni Logistics Center. July 22.

making trucks more fuel-efficient and expediting truck turnover rather than reducing VMT from trucks. This is in contrast to the passenger vehicle component of the transportation sector, where both per capita VMT reductions and an increase in vehicle efficiency are forecast to be needed to achieve the overall State emissions reductions goals.

Emissions associated with heavy-duty trucks involved in goods movements are generally controlled on the technology side and through fleet turnover of older trucks and engines to newer and cleaner trucks and engines. The following State strategies reduce GHG emissions from medium and heavy-duty trucks:

- ARB's Mobile Source Strategy focuses on reducing GHGs by transitioning to zero and low emission vehicles and from medium-duty and heavy-duty trucks.[95]
- ARB's Sustainable Freight Action Plan establishes a goal to improve freight efficiency by 25 percent by 2030, deploy over 100,000 freight vehicles and equipment capable of zero-emission operation and maximize both zero and near-zero-emission freight vehicles and equipment powered by renewable energy by 2030.[96]
- ARB's Truck and Bus Regulation requires diesel-fueled trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. [97]
- ARB's Emissions Reduction Plan for Ports and Goods Movement (Goods Movement Plan) in California focuses on reducing heavy-duty truck-related emissions and the establishment of emissions standards for trucks, fleet turnover, truck retrofits, and restriction on truck idling.[98] While the focus of the Goods Movement Plan is to reduce criteria air pollutant and air toxic emissions, the strategies to reduce these pollutants would also generally have a beneficial effect in reducing GHG emissions.

Trucks and truck fleet owners and operators accessing the proposed project would be subject to the above trucking and freight regulations. Thus, these strategies would contribute to controlling heavy-duty truck GHG emissions associated with the proposed project, and the proposed project would not conflict with or inhibit these Statewide strategies. Any on-site trucks would be required to comply with ARB's Heavy-Duty (Tractor-Trailer) GHG Regulation, which requires SmartWay tractor trailers that include idle-reduction technologies, aerodynamic technologies, and low-rolling resistant tires that would reduce fuel consumption and associated GHG emissions. Furthermore, truck manufacturers would be required to comply with the ARB ACT Rule, which requires manufacturers of medium- and heavy-duty trucks and vans to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. Under the ACT Rule, by 2035, zero-emission truck/chassis sales would need to be 55 percent of Class 2b to Class 3 truck sales, 75 percent of Class

[95] California Air Resources Board (ARB). 2017. California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target. November. Website: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed May 17, 2021.

[96] Ibid.

[97] California Air Resources Board (ARB). 2015. On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation. Website: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed September 22, 2017.

[98] California Air Resources Board (ARB). 2006. Emission Reduction Plan for Ports and Goods Movement in California. April 20. Website: https://bayplanningcoalition.org/downloads/library/Emission_Reduction_Plan_for_Ports_and_Intl_Goods_Movement_in_CA.pdf. Accessed May 17, 2021.

4 to Class 8 straight truck sales, and 40 percent of truck tractor sales.[99] Moreover, as required under Mitigation Measure (MM) AIR-1d, the proposed project would utilize trucks no older than model year 2014, which would provide additional reductions in truck-associated GHG emissions. As the proposed project would not include any feature or design which would prohibit the implementation of these vehicle emission standards, the proposed project would be compliant with this provision.

Considering the above assessment, the project operation would be consistent with the BAAQMD's proposed 2022 GHG significance thresholds. As such, the project operation would have a less than significant impact related to GHG emissions after the incorporation of MM AIR-1d and MMs GHG-1a through MM GHG-1e.

Conclusion

The proposed project would generate GHG emissions during construction and operation. The BAAQMD or City do not have an emissions threshold for determining potentially significant impacts related to construction GHG emissions; therefore, the BAAQMD's recommended GHG-reducing BMPs was utilized as the basis for determining the proposed project's construction-related impact. The proposed project would include the applicable GHG-reducing BMPs during construction through implementation of MM GHG-1a. MM GHG-1a notably has more construction BMPs than those recommended by the BAAQMD. The project applicant has identified these additional construction BMPs as feasible and applicable means to maximize GHG emission reductions during project construction; therefore, MM GHG-1a incorporates additional BMPs beyond those recommended by the BAAQMD to further the proposed project's contribution to its "fair share" in GHG emission reductions during construction toward the State's long-term climate goal of carbon neutrality by 2045. Because MM GHG-1a would require the proposed project to meet and exceed implementation of the BAAQMD-recommended BMPs for reducing construction GHG emissions, project construction would be considered to commit its "fair share" of GHG emission reductions consistent with the State's long-term climate goal of carbon neutrality and would therefore be less than significant.

GHG emissions associated with full operation of the proposed project for the anticipated first operation in 2023 are shown in Table 3.6-4, which incorporates implementation of MMs AIR-2c and AIR-2d. As discussed in Section 3.2, Air Quality, MM AIR-2c would be required to ensure the use of low-VOC (i.e., reactive organic gas [ROG]) architectural coating products that contain no more than 50 grams of VOC per liter of product to reduce the generation of ROG emissions during project operation. Any GHG emissions generated during architectural coating reapplication would be captured under area-source emissions in Table 3.6-4. As shown therein, area-source emissions generated during project operation would be less than 0.5 MT CO_2e per year and was therefore rounded down to zero. As such, MM AIR-2c would result in a negligible effect on operational GHG emission generated by the proposed project.

As discussed in Section 3.2, Air Quality, MM AIR-2d would be required to ensure the trucking fleet accessing the project site would be comprised of vehicles no older than model year 2014 to reduce tailpipe NO_X emissions. Model year 2014 was selected because it is the first homogenous model year

[99] California Air Resources Board (ARB). 2020. Advanced Clean Trucks: Accelerating Zero-Emission Truck Markets. June 25. Website: https://ww2.arb.ca.gov/sites/default/files/2020-06/200625factsheet_ADA.pdf. Accessed May 17, 2021.

for a trucking fleet in Napa County, based on EMFAC2017 data, to demonstrate a reduction in NO_X emissions when compared with unmitigated emission estimates. This is considered a feasible trucking mitigation measure as the ARB's Truck and Bus Regulation[100] would otherwise require trucks greater than a 26,000-pound gross vehicle weight rating which operate in California to be no older than 2010 model year by the time the proposed project would become operational in 2023. This would allow the proposed project to utilize trucks which are 9 years old and would not constitute an infeasible financial burden.

While the trucking fleet serving the proposed project would represent the greatest GHG emission source during project operation, as illustrated in Table 3.6-4, MM AIR-2d was determined to be the most feasible trucking mitigation to reduce tailpipe emissions of all types, including GHG emissions, due to the size of the trucking fleet. With over 500 trucks accessing the proposed project each day, the financial burden associated with implementing more stringent trucking mitigation is very likely to amount a cost greater than what a "prudent investor" would otherwise bear to develop the proposed project. In addition, the other principal emission source of passenger vehicles would not be possible to mitigate through project design as the operation of privately owned vehicles by employees and visitors would not be under the direct control of the proposed project.

Moreover, as discussed under Impact GHG-1, MMs GHG-1b through GHG-1e would ensure project consistency with the BAAQMD's proposed 2022 GHG significance thresholds, as refined by the City, by prohibiting the use of natural gas infrastructure, complying with the Tier 2 EV charging infrastructure requirements of CALGreen, complying with the Tier 2 energy efficiency standards of CALGreen, and sourcing project electricity consumption from carbon-free sources. In addition, MMs GHG-1b through GHG-1e would reduce the proposed project's reliance on fossil fuels and reduce the potential for the wasteful, inefficient, or unnecessary consumption of energy resources.

Lastly, as discussed further under Impact GHG-1, the proposed project would demonstrate a 15 percent reduction in employee-generated VMT from the region's existing employee VMT, consistent with the BAAQMD's proposed 2022 GHG significance thresholds for VMT reductions for other identified land use types, including office uses, which the City has determined are similar to industrial uses. In addition, the proposed project's trucking operations would be subject to incrementally more stringent tailpipe emission standards and fleet turnover requirements through various ARB programs and rules, further facilitating the use of EVs and reducing the generation of truck-generated GHG emissions. As such, incorporation of MMs GHG-1b through GHG-1e would reduce the proposed project's potentially significant operational impacts related to GHG emissions to a less than significant level.

The proposed project's construction and operational GHG emissions impacts would be considered less than significant.

[100] California Air Resources Board (ARB). 2019. Truck and Bus Regulation Compliance Requirement Overview. June 18. Website: https://www.arb.ca.gov/msprog/onrdiesel/documents/fsregsum.pdf?_ga=2.176823522.653555524.1631722616-611272733.1590599157. Accessed September 16, 2021.

Level of Significance Before Mitigation

Potentially significant impact.

Mitigation Measures

MM GHG-1a Prior to the issuance of any grading permits, the project applicant shall provide the City of American Canyon with documentation (e.g., site plans) demonstrating project construction will include the following construction Best Management Practices (BMPs):

- At least 15 percent of the construction fleet for each project phase shall be alternatively fueled or electric.
- At least 10 percent of building materials used for project construction shall be sourced from local suppliers.
- At least 65 percent of construction and demolition waste materials shall be recycled or reused.
- At least one contractor that has a business location in American Canyon shall be contracted for project construction.
- All construction contracts shall include language that requires all off-road equipment with a power rating below 19 kilowatts (e.g., plate compactors, pressure washers) using during construction be electrically powered.
- Architectural coatings used for project construction shall be "Low-VOC," containing no greater than 50 grams of volatile organic compounds (VOC) per liter of product.
- Project construction shall prohibit the use of generators and shall establish grid power connection to electrical equipment needs.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure [ATCM] Title 13, Section 2485 of California Code of Regulations). Clear signage regarding idling restrictions shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- The prime construction contractor shall post a publicly visible sign with their telephone number and contractor to contact. The construction contractor shall take corrective action within 48 hours. The Bay Area Air Quality Management District (BAAQMD) phone number shall also be identified and visible to ensure compliance with applicable regulations.

MM GHG-1b Prior to the issuance of any building permits, the project applicant shall provide the City of American Canyon with documentation (e.g., site plans) demonstrating the proposed project is designed without the use of any natural gas -fueled appliances or natural gas plumbing.

MM GHG-1c Prior to issuance of any building permits, the project applicant shall demonstrate to the satisfaction of the City of American Canyon (e.g., shown on-site plans), that the proposed buildings are designed and will be built to, at a minimum, the Tier 2 advanced energy efficiency requirements of the Nonresidential Voluntary Measures of the California Green Building Standards Code, Division A5.2, Energy Efficiency, as outlined under Section A5.203.1.2.2.

MM GHG-1d Prior to issuance of any building permits, the project applicant shall demonstrate to the satisfaction of the City of American Canyon (e.g., shown on-site plans), that the proposed parking areas for passenger automobiles and trucks are designed and will be built to accommodate electric vehicle (EV) charging stations. At a minimum, the parking shall be designed to accommodate a number of EV charging stations equal to the Tier 2 Nonresidential Voluntary Measures of the California Green Building Standards Code, Section A5.106.5.3.2.

Prior to the issuance of any building permits, the project applicant shall demonstrate to the satisfaction of the City of American Canyon (e.g., shown on-site plans), that each loading dock is each outfitted with at least one 240-volt outlet to accommodate truck and Transport Refrigeration Unit (TRU) charging and/or electrical power connection while trucks are loading and unloading goods.

MM GHG-1e Prior to the issuance of any building permit for the proposed project, the project applicant shall provide the City with documentation (e.g., site plans) demonstrating to the City's satisfaction that the electricity demand will be supplied with 100 percent carbon-free electricity sources through the year 2045.

Level of Significance After Mitigation

Less than significant impact.

Conflict with Plan, Policy, or Regulation that Reduces Emissions

Impact GHG-2:	**The proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.**

Impact Analysis

The following discusses project consistency with applicable plans adopted to reduce GHG emissions, including ARB's 2017 Scoping Plan, MTC/ABAG Plan Bay Area 2040, and the City of American Canyon EECAP.

California Air Resources Board Scoping Plan

The principal State plan and policy for GHG emission reduction targets are set forth in Executive Order S-03-05, AB 32, and the subsequent SB 32. The quantitative goal of AB 32 was to reduce GHG emissions to 1990 levels by 2020. AB 32 required the ARB to develop a Scoping Plan that describes California's approach to reduce GHGs to achieve the 2020 emission target. SB 32 then accelerated the GHG emission reduction goals of AB 32. The 2017 Scoping Plan Update, the most recent update to the ARB Scoping Plan, reflects the 2030 target of a 40 percent reduction below 1990 levels as set

by Executive Order B-30-15 and codified by SB 32. It applies to State agencies but is not directly applicable to cities, counties, or individual projects (i.e., the Scoping Plan does not require the City to adopt policies, programs, or regulations to reduce GHG emissions). However, new regulations adopted by the State agencies outlined in the Scoping Plan result in GHG emissions reductions at the local level. As a result, local jurisdictions benefit from reductions in transportation emissions rates, increases in water efficiency in the building and landscape codes, and other Statewide actions that affect a local jurisdiction's emissions inventory from the top down.

Transportation Sector

Trucks

In general, the State strategy for the transportation sector for medium and heavy-duty trucks focuses on making trucks more efficient and expediting truck turnover rather than reducing VMT from trucks. This is in contrast to the passenger vehicle component of the transportation sector, where both per capita VMT reductions and an increase in vehicle efficiency are forecast to be needed to achieve the overall State emissions reductions goals.

Emissions associated with heavy-duty trucks involved in goods movements are generally controlled on the technology side and through fleet turnover of older trucks and engines to newer and cleaner trucks and engines. The following State strategies reduce GHG emissions from medium and heavy-duty trucks:

- ARB's Mobile Source Strategy focuses on reducing GHGs by transitioning to zero and low emission vehicles and from medium-duty and heavy-duty trucks.[101]
- ARB's Sustainable Freight Action Plan establishes a goal to improve freight efficiency by 25 percent by 2030, deploy over 100,000 freight vehicles and equipment capable of zero-emission operation and maximize both zero and near-zero-emission freight vehicles and equipment powered by renewable energy by 2030.[102]
- ARB's Truck and Bus Regulation requires diesel-fueled trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. [103]
- ARB's Emissions Reduction Plan for Ports and Goods Movement (Goods Movement Plan) in California focuses on reducing heavy-duty truck-related emissions and the establishment of emissions standards for trucks, fleet turnover, truck retrofits, and restriction on truck idling.[104] While the focus of the Goods Movement Plan is to reduce criteria air pollutant and air toxic emissions, the strategies to reduce these pollutants would also generally have a beneficial effect in reducing GHG emissions.

[101] California Air Resources Board (ARB). 2017. California's 2017 Climate Change Scoping Plan: The Strategy for Achieving California's 2030 Greenhouse Gas Target. November. Website: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. Accessed May 17, 2021.
[102] Ibid.
[103] California Air Resources Board (ARB). 2015. On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation. Website: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed September 22, 2017.
[104] California Air Resources Board (ARB). 2006. Emission Reduction Plan for Ports and Goods Movement in California. April 20. Website: https://bayplanningcoalition.org/downloads/library/Emission_Reduction_Plan_for_Ports_and_Intl_Goods_Movement_in_CA.pdf. Accessed May 17, 2021.

The proposed project would be subject to the above trucking and freight regulations. Thus, these strategies would contribute to controlling heavy-duty truck GHG emissions associated with the proposed project. The proposed project would not conflict with or inhibit these Statewide strategies. Any on-site trucks would be required to comply with ARB's Heavy-Duty (Tractor-Trailer) GHG Regulation, which requires SmartWay tractor trailers that include idle-reduction technologies, aerodynamic technologies, and low-rolling resistant tires that would reduce fuel consumption and associated GHG emissions. Furthermore, truck manufacturers would be required to comply with the ARB ACT Rule, which requires manufacturers of medium- and heavy-duty trucks and vans to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. Under the ACT Rule, by 2035, zero-emission truck/chassis sales would need to be 55 percent of Class 2b to Class 3 truck sales, 75 percent of Class 4 to Class 8 straight truck sales, and 40 percent of truck tractor sales.[105] As the proposed project would not include any feature or design which would prohibit the implementation of these vehicle emission standards, the proposed project would be consistent with these requirements.

Passenger Vehicles

Statewide strategies to reduce GHG emissions from passenger vehicles and the transportation sector in general include the LCFS and changes in the Corporate Average Fuel Economy Standards (e.g., Pavley I and Pavley California Advanced Clean Cars program). Furthermore, Executive Order N-79-20 would also require that 100 percent of new passenger cars and trucks sold in California be zero-emission by 2035, which would indirectly contribute to the extent of EV utilization in the proposed project's passenger vehicle fleet beyond 2035. As the proposed project would not include any feature or design which would prohibit the implementation of these vehicle emission standards, the proposed project would be consistent with these requirements.

Energy Sector

As shown in Table 3.6-4, energy use generated by the proposed project represents the second largest source of emissions after considering mobile source GHG emissions. As discussed under Impact GHG-1, MM GHG-1c the proposed project would meet the Tier 2 energy efficiency requirements of the current CALGreen and Building Energy Efficiency Standards. Moreover, the proposed project would be sourcing electricity from on-site generation sources and/or utility providers in the State. As required by MM GHG-1e, any electricity consumed by the proposed project would be from carbon-free sources, such as an on-site photovoltaic system. If the proposed project secures electricity purchases from a utility provider, the proposed project would be required by MM GHG-1e to purchase 100 percent carbon-free electricity through the year 2045, at which time utility providers would be required to supply 100 percent carbon-free electricity for all in-state sales, as required by SB 100. As such, the proposed project would meet the requirements contained in the 2019 California Building Code and would be consistent with the State's current CALGreen and Building Energy Efficiency Standards and the State's renewable energy legislation, SB 100.

[105] California Air Resources Board (ARB). 2020. Advanced Clean Trucks: Accelerating Zero-Emission Truck Markets. June 25. Website: https://ww2.arb.ca.gov/sites/default/files/2020-06/200625factsheet_ADA.pdf. Accessed May 17, 2021.

Other Sources

Other sources of GHG emissions include solid waste disposal, which is associated with landfilling municipal solid waste. The amount of methane emitted to the atmosphere as a fraction of the total amount of methane generated from the decomposition of accumulated waste has gradually declined over time as more landfills install landfill gas collection and control systems and existing systems are operated more efficiently as a result of ARB's Landfill Methane Control Measure.[106] Therefore, the proposed project would be consistent with the State's goals for the recycling and waste sector.

Metropolitan Transportation Commission Plan Bay Area

As part of the implementing framework for Plan Bay Area 2050, local governments have identified planned development areas to focus growth. The project site is within the Napa County Airport Land Use Compatibility Plan area. Thus, the proposed project would be consistent with the overall goals of Plan Bay Area, which include concentrating new investment in areas that would encourage job growth. In addition, the proposed project would be developed in an area with existing infrastructure. Therefore, the proposed project would generally not conflict with the land use concept plan in Plan Bay Area 2050.

The project site is located approximately 700 feet from State Route (SR) 29. The closest public transit option would be the Vine bus system, operated by the Napa Valley Transportation Authority. The Vine provides transit opportunities throughout Napa County. The closest Vine stop is the American Canyon City Hall bus stop on Napa-Vallejo Connector Route 11, which extends from the Redwood Park n Ride in Napa, CA to the Vallejo Ferry Terminal. The stop is 1.5 miles from the project site. As such, it is not likely that many employees would travel to the project site using public transit.

City of American Canyon Energy Efficient Climate Action Plan

The City of American Canyon adopted its EECAP in 2012.[107] The EECAP identifies reduction measures and implementation responsibilities that the City used to achieve the State-recommended GHG emissions reduction target of 15 percent below 2005 emission levels by the year 2020 to fulfill the requirements of AB 32 and SB 375. Many of these measures are not mandatory or apply to government agencies rather than a project applicant or lead agency. The City would impose the requirements of these measures as applicable through local regulations and ordinances. Table 3.6-6 lists the relevant measures of the City's EECAP and analyzes how the proposed project would conflict or be consistent with the EECAP and the relevant measures therein.

Table 3.6-5: Consistency with American Canyon Energy Efficient Climate Action Plan

Climate Action Plan Measure	Description	Applicability and Compliance
Community Strategy 1. Existing Uses–Nonresidential. Increase voluntary energy efficiency efforts and participation in PG&E energy efficiency programs by targeting sectors that are responsible for the largest portions of energy use, currently have low or medium participation rates, and/or have low savings-to-use ratios.		

[106] California Air Resources Board (ARB). 2020. Advanced Clean Trucks: Accelerating Zero-Emission Truck Markets. June 25. Website: https://ww2.arb.ca.gov/sites/default/files/2020-06/200625factsheet_ADA.pdf. Accessed May 17, 2021.

[107] City of American Canyon. 2012. Energy Efficiency Climate Action Plan. Website: https://www.cityofamericancanyon.org/home/showdocument?id=5024. Accessed May 19, 2021.

Climate Action Plan Measure	Description	Applicability and Compliance
Community Measure C-1: Targeted Energy Efficiency Outreach to Nonresidential Energy Customers.	Use PG&E data to target specific nonresidential customer sectors for participation in PG&E programs or other local, regional, or State programs.	**Not Applicable**. This measure applies to the City and/or PG&E outreach effort.
Community Measure C-2: Develop of Voluntary Nonresidential Energy Efficiency Checklist.	Build upon the energy disclosure requirements of AB 1103 to develop a voluntary nonresidential energy efficiency checklist that will be available at the time of building sale.	**Not Applicable**. This measure applies to the City's responsibility to develop a nonresidential energy efficiency checklist.
Community Measure C-3: Participate in a Nonresidential Property Assessed Clean Energy (PACE) Program.	Provide additional financing opportunities for energy efficiency improvements for commercial structures by participating in a PACE program.	**Not Applicable**. This measure applies to the City's responsibility to provide financing opportunities for participation in energy efficiency programs.
Community Strategy 3: New Development–Nonresidential. Ensure new development exceeds California's Title 24 energy efficiency standard by 15 percent or more.		
Community Measure C-6: Savings By Design for New Nonresidential Construction.	Require participation in PG&E's Savings by Design Program (or future iterations of such a program) for all new nonresidential new construction projects.	**Not Applicable**. This measure applies to the City's responsibility for requiring participation in PG&E's Savings by Design Program, which is currently not accepting new applications.[108]
Community Measure C-7: Require Energy Efficiency Beyond State Code for New Nonresidential Construction	Through 2013, provide a streamlined permit process for new nonresidential construction projects that incorporate energy efficiency improvements beyond Title 24, include all items on a voluntary energy efficiency checklist, or include renewable energy improvements. Starting in 2014 or 2017, require that all new construction achieve Tier 1 of Title 24 standards (15 percent more stringent than the mandatory standards.)	**Not Applicable.** This measure applies to the City's responsibility to require more stringent energy efficiency standards which exceed the energy efficiency performance experienced under minimal compliance with Title 24 requirements.
Community Strategy 6. Renewable Energy. Increase the number of distributed renewable energy installations on residential and Nonresidential properties to three new nonresidential sites/year and 15 residential sites/year by 2020.		

[108] Pacific Gas and Electric Company (PG&E). 2021. Explore the Savings By Design Program. Website: https://www.pge.com/en_US/large-business/save-energy-and-money/facility-improvement/savings-by-design.page?WT.mc_id=Vanity_savingsbydesign. Accessed April 28, 2021.

Climate Action Plan Measure	Description	Applicability and Compliance
Community Measure C-11: Solar Ready Roofs for New Construction	Require solar ready roofs that are pre-wired and ready for the installation of solar photovoltaic panels and solar water heating systems.	**Consistent.** The proposed project would include roof structures designed to accommodate additional weight for rooftop photovoltaic electricity generation panel arrays.
Community Strategy 7. Water Conservation. Reduce per capita community water use 20 percent by 2020 from the 2005 baseline.		
Community Measure C-13: Community Water Reduction	Reduce community water use through building and landscape design and improvements.	**Consistent**. The proposed project would include water efficient landscaping and water use reduction methods. Moreover, the proposed project anticipates using recycled water for all irrigated lands.[109]
Source: City of American Canyon. 2012. Energy Efficiency Climate Action Plan (EECAP). Website: https://www.cityofamericancanyon.org/home/showdocument?id=5024. Accessed April 7, 2021.		

As shown in Table 3.6-6, the proposed project incorporates features that would contribute to the City's strategy to minimize GHG emissions. With these features, the proposed project would not conflict with the applicable measures and implementing actions identified by the City of American Canyon EECAP.

SB 32 2017 Scoping Plan Update

As discussed above, the 2017 Climate Change Scoping Plan Update addressing the SB 32 targets was adopted on December 14, 2017. Table 3.6-6 analyzes the proposed project's consistency with the 2017 Scoping Plan Update measures. As shown in Table 3.6-6, none of the measures are applicable to the proposed project.

Table 3.6-6: Consistency with SB 32 2017 Scoping Plan Update

2017 Scoping Plan Update Reduction Measure	Project Consistency
SB 350 50 Percent Renewable Mandate. Utilities subject to the legislation will be required to increase their renewable energy mix from 33 percent in 2020 to 50 percent in 2030.	**Not Applicable.** This measure would apply to utilities and not to individual development projects. The proposed project would purchase electricity from a utility subject to the SB 350 and SB 100 Renewable Portfolio Standards requirements.
SB 350 Double Building Energy Efficiency by 2030. This is equivalent to a 20 percent reduction from 2014 building energy usage compared to current projected 2030 levels.	**Not Applicable**. This measure applies to existing buildings. New structures are required to comply with the Tier 2 energy efficiency standards of the California Building Code through implementation of MM GHG-1c. In addition, the proposed project would source its electricity consumption from 100 percent carbon-free sources, as required by MM GHG-1d.

[109] Balance Hydrologics. 2021. Draft Water Supply Assessment for the Giovannoni Logistics Center Project. September.

2017 Scoping Plan Update Reduction Measure	Project Consistency
Low Carbon Fuel Standard. This measure requires fuel providers to meet an 18 percent reduction in carbon content by 2030.	**Not Applicable.** This is a Statewide measure that cannot be implemented by a project applicant or lead agency. However, vehicles accessing the buildings at the proposed project site would benefit from the standards.
Mobile Source Strategy (Cleaner Technology and Fuels Scenario). Vehicle manufacturers will be required to meet existing regulations mandated by the LEV III and Heavy-Duty Vehicle programs. The strategy includes a goal of having 4.2 million ZEVs on the road by 2030 and increasing numbers of ZEV trucks and buses.	**Not Applicable.** This measure is not applicable to the proposed project; however, vehicles accessing the buildings at the project site would benefit from the increased availability of cleaner technology and fuels.
Sustainable Freight Action Plan. The plan's target is to improve freight system efficiency 25 percent by increasing the value of goods and services produced from the freight sector, relative to the amount of carbon that it produces by 2030. This would be achieved by deploying over 100,000 freight vehicles and equipment capable of zero-emission operation and maximize near-zero-emission freight vehicles and equipment powered by renewable energy by 2030.	**Consistent.** This measure applies to owners and operators of trucks and freight operations. While the proposed project is industrial in nature and would support truck and freight operations, neither the proposed project's design nor nature would prevent truck fleet owners and operators from utilizing zero-emission or near-ZEVs by 2030. Moreover, as required by MM GHG-1e, the proposed project would design and construct all automobile and truck parking areas to meet the Tier 2 EV charging infrastructure requirements of CALGreen. MM GHG-1e would further accelerate the possible adoption of EVs and support this measure.
Short-Lived Climate Pollutant (SLCP) Reduction Strategy. The strategy requires the reduction of SLCPs by 40 percent from 2013 levels by 2030 and the reduction of black carbon by 50 percent from 2013 levels by 2030.	**Not Applicable**. Black carbon is formed by the incomplete combustion of fossil fuels, wood, and other fuels. Households currently constitute the largest source of black carbon worldwide, primarily originating from the use of biomass and coal cooking and heating stoves.[110] Nonetheless, the proposed project would involve trucking activities. As such, freight vehicles accessing the project site would be required to meet the standards of the ARB's Sustainable Freight Action Plan and Truck and Bus Regulation, which would serve to reduce potential freight-related black carbon emissions resulting from fossil fuel combustion. Therefore, the proposed project would not constitute a major source of black carbon.
SB 375 Sustainable Communities Strategies. Requires Regional Transportation Plans to include a sustainable communities' strategy for reduction of per capita VMT.	**Not Applicable.** The proposed project does not include the development of a Regional Transportation Plan.

[110] Climate and Clean Air Coalition (CCAC). N.d. Black carbon. Website: https://www.ccacoalition.org/en/slcps/black-carbon. Accessed April 1, 2022.

2017 Scoping Plan Update Reduction Measure	Project Consistency
Post-2020 Cap-and-Trade Program. The Post 2020 Cap-and-Trade Program continues the existing program for another 10 years. The Cap-and-Trade Program applies to large industrial sources such as power plants, refineries, and cement manufacturers.	**Not Applicable.** The proposed project is not one targeted by the cap-and-trade system regulations, and, therefore, this measure does not apply to the proposed project.
Natural and Working Lands Action Plan. The ARB is working in coordination with several other agencies at the federal, State, and local levels, stakeholders, and with the public, to develop measures as outlined in the Scoping Plan Update and the Governor's Executive Order B-30-15 to reduce GHG emissions and to cultivate net carbon sequestration potential for California's natural and working land.	**Not Applicable**. The proposed project is in a built-up urban area and would not be considered natural or working lands.
Source: California Air Resource Board (ARB). 2017. California's 2017 Climate Change Scoping Plan. November. Website: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed May 17, 2021.	

As shown in Table 3.6-6, the proposed project's implementation would not conflict with the reduction measures proposed in SB 32. As such, the proposed project would not conflict with any applicable plan, policy, or regulation adopted to reduce GHG emissions. Therefore, impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.

Impact GHG-3: The proposed project would not result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Impact Analysis

A significant impact would occur if the proposed project would result in the inefficient, wasteful, or unnecessary use of energy.

Construction

The anticipated construction schedule for the proposed project was assumed to begin in January 2022 and conclude in August 2023, lasting approximately 20 months. If the anticipated construction schedule moves to later years, construction energy demand would likely decrease because of improvements in

technology and more stringent regulatory requirements as older, less efficient equipment is replaced by newer and cleaner equipment. The proposed project would require site preparation, grading, building construction, architectural coating, and paving activities. Project construction would require energy for the manufacture and transportation of building materials, preparation of the site (e.g., site clearing, and grading), and the actual construction of the building. Petroleum-based fuels such as diesel fuel and gasoline would be the primary sources of energy for these tasks.

The types of on-site equipment used during the proposed project's construction could include gasoline- and diesel-powered construction and transportation equipment, including trucks, bulldozers, front-end loaders, forklifts, and cranes. Construction equipment is estimated to consume a total of 51,911 gallons of diesel fuel during project construction (Appendix B).

Fuel use associated with construction vehicle trips generated by the proposed project was also estimated; trips include construction worker trips, haul truck trips for material transport, and vendor trips for construction material deliveries. Fuel use from these vehicles traveling to the project site was based on (1) the projected number of trips the proposed project would generate during construction, (2) average trip distances by trip type, and (3) fuel efficiencies estimated in the ARB Emissions Factors model (EMFAC) mobile source emission model. The specific parameters used to estimate fuel usage are included in Appendix B. In total, the proposed project is estimated to consume a combined 337,528 gallons of gasoline and diesel for vehicle travel during construction.

Other equipment could include construction lighting, field services (office trailers), and electrically driven equipment such as pumps and other tools. Singlewide mobile office trailers, commonly used in construction staging areas, generally range in size from 160 square feet to 720 square feet. A typical 720-square-foot office trailer would consume approximately 20,152 kilowatt-hours (kWh) during the 20-month construction phase (Appendix B).

The proposed project’s construction is not anticipated to result in unusually high energy use. Limitations on idling of vehicles and equipment and requirements that equipment be properly maintained would result in fuel savings. Similarly, compliance with State regulations would limit idling from both on-road and off-road diesel-powered equipment and are enforced by the ARB. Additionally, the overall construction schedule and process is already designed to be efficient to avoid excess monetary costs. For example, equipment and fuel are not typically used wastefully due to the added expense associated with renting the equipment, maintaining it, and fueling it. Therefore, the opportunities for future efficiency gains during construction are limited. Therefore, it is anticipated that the construction phase of the proposed project would not result in wasteful, inefficient, and unnecessary consumption of energy. Construction-related energy impacts would be less than significant.

Operation

The proposed project would consume energy as part of building operations and transportation activities. Project energy consumption is summarized in Table 3.6-7.

Table 3.6-7: Annual Project Energy Consumption

Energy Consumption Activity	Annual Consumption	
	Dry Storage Scenario	Cold Storage Scenario
Electricity Consumption	8,834,476 kWh/year	24,495,402 kWh/year
Natural Gas Consumption	8,260,000 kBTU/year	9,060,000 kBTU/year
Total Passenger Vehicle Fuel Consumption	280,981 gallons/year	280,981 gallons/year
Total Truck Fuel Consumption	971,529 gallons/year	971,529 gallons/year
Total Locomotive Fuel Consumption	537 gallons/year	537 gallons/year
Total TRU Fuel Consumption	–	1,304 gallons/year

Notes:
kBTU = kilo-British Thermal Unit
kWh = kilowatt-hour
TRU = Transport Refrigeration Unit
Locomotive fuel consumption is based on an average monthly delivery capacity of 500,000 ton-miles.
Source: Appendix B

Operation of the proposed project would consume an estimated 24,495,402 kWh of electricity and an estimated 9,060,000 kBTU of natural gas annually under the cold storage project scenario and an estimated 8,834,476 kWh of electricity and an estimated 8,260,000 kBTU of natural gas annually under the dry storage project scenario. As previously discussed, the proposed project would be considered to result in a potentially significant impact if it would result in wasteful, inefficient, or unnecessary consumption of energy resources. Considering the guidance provided by Appendix F of the CEQA Guidelines and the Appellate Court decision in *League to Save Lake Tahoe Mountain etc. v. County of Placer* (2022) 75 Cal.App.5th 63, 164-168, the proposed project would be considered to result in wasteful, inefficient, or unnecessary consumption of energy resources if it would conflict with the following energy conservation goals:

- Decreasing overall per capita energy consumption;
- Decreasing reliance on fossil fuels such as coal, natural gas, or oil; and
- Increasing reliance on renewable energy sources.

Decreasing Overall Per Capita Energy Consumption

As discussed under Impact GHG-1, the proposed project would result in an approximately 29 percent reduction in employee VMT from regional average estimates. As such, the proposed project would result in an overall decrease in per capita transportation energy consumption with respect to employee transportation energy resources. As discussed under Impact GHG-1, trucking activities envisioned by the proposed project would be generally controlled by new technologies and the mandatory turnover of fleets through medium and heavy-duty truck emission standards and regulations. Moreover, the movement of freight goods and trucking and locomotive travel distances subsequent to that activity is largely dictated by market demand rather than the implementation of a specific development project, such as the proposed project. As such, overall energy consumption

related to trucking and locomotive activities is expected to not change as a result of implementation of the proposed project, and overall energy consumption related to employee transportation would decrease from that experienced by the region's current average employee transportation behavior.

As discussed above in Section 3.6.2, Environmental Setting, the County currently has estimated per capita energy consumption of 7,471 kWh and 28.45 MMBtu per year. The County estimates are utilized herein rather than City estimates because this energy consumption data is not available at the City level. As shown in Table 3.6-7, the proposed project would result in up to 24,495,402 kWh per year and up to 9,060 MMBtu per year under a cold storage scenario starting in 2023 without considering any mitigation. As the proposed project is nonresidential, the number of estimated employees is used herein to identify the proposed project's per capita energy consumption. As the proposed project is expected to generate employment for an estimated 3,643 people, the proposed project would result in a per capita energy consumption of 6,724 kWh per year and 2.49 MMBtu per year, both of which would be below the County's average electricity and natural gas consumption rates.

It should be noted that with implementation of MM GHG-1c, the proposed project is likely to consume less electricity than what is disclosed in Table 3.6-7 due to the required additional energy efficiency improvements and the fact that CalEEMod Version 2020.4.0 assumes minimum energy efficiency design compliance with the 2019 California Building Code. Should the permitting of the proposed project occur after January 1, 2023, the proposed project would be subject to additional energy efficiency standards beyond what is currently required at the time of this analysis. Nonetheless, the proposed project is likely to result in greater electricity consumption than what would otherwise occur as a result of implementation of MM GHG-1b, which would require the proposed project to implement an all-electric building design. Nevertheless, with implementation of MM GHG-1b, the proposed project would reduce natural gas-related energy consumption by 100 percent even if electricity consumption increased, thereby contributing to the overall decrease in per capita energy consumption. Considering the above assessment as well as the fact that the proposed project would result in an overall decrease in per capita building energy consumption before mitigation, the proposed project is considered consistent with this criterion with respect to per capita building energy consumption.

Decreasing Reliance on Fossil Fuels

The proposed project would be considered to conflict with this criterion if it did not take steps to decrease the reliance on fossil fuels. As discussed under Impact GHG-1, the proposed project would be required to implement MMs GHG-1a through GHG-1e to reduce GHG emissions. MMs GHG-1a through GHG-1e would also contribute to greater energy efficiency, the reduction in fossil fuel consumption, and an increase in consumption of renewable energy resources. Specifically focusing on decreased reliance on fossil fuels, MM GHG-1a would require the project applicant to utilize electric and alternatively fueled construction equipment and local contractors, among other requirements, which would reduce the proposed project's commitment of fossil fuel energy resources during project construction. Moreover, MM GHG-1b would require the proposed project to prohibit the installation of natural gas infrastructure, thereby precluding the proposed project's future use of natural gas. Lastly, MM GHG-1d would require the proposed project to source 100

percent of its electricity from carbon-free source, either from installing on-site renewable generation technologies, purchasing eligible renewable electricity services from PG&E or MCE, or a combination thereof. As such, the implementation of MMs GHG-1a, GHG-1b, and GHG-1d would actively promote the proposed project's decreased reliance on fossil fuels through the design and operation of the proposed project. Therefore, the proposed project would be consistent with this criterion with mitigation.

Increasing Reliance on Renewable Energy Sources

As previously discussed, MM GHG-1a would require the project applicant to utilize electric and alternatively fueled construction equipment and local contractors, among other requirements, which would reduce the proposed project's commitment of fossil fuel energy resources during project construction. MM GHG-1a would increase the proposed project's reliance on renewable energy sources during project construction. During operations, the proposed project's buildings would be designed and constructed, consistent with MM GHG-1c, in accordance with the State's Tier 2 Nonresidential Building Energy Efficiency Standards, which are widely regarded as some of the most advanced building energy efficiency standards in the country. In addition, the proposed project would be required under MM GHG-1e to install a greater amount of EV charging infrastructure than what would otherwise be experienced through minimum code compliance.

The proposed project would also include roof structures designed to accommodate additional weight for rooftop photovoltaic panel arrays should they be installed. MM GHG-1d would additionally require that the proposed project source its electricity consumption from carbon-free sources, either with on-site renewable generation technologies or through subscription with a 100 percent carbon-free electricity service with PG&E or MCE. Moreover, MM GHG-1b would require the proposed project to out-right prohibit the use of natural gas during project operation, thereby reducing project dependence on fossil fuels and removing legacy GHG emission sources in contributing to achieving the State's long-term climate goal of carbon neutrality by 2045.

Moreover, MM GHG-1e would require that the proposed parking areas are designed and will be built to accommodate additional EV charging stations than would be required with minimum code compliance. At a minimum, the parking shall be designed to accommodate EV charging stations in an amount equal to the Tier 2 Nonresidential Voluntary Measures of the California Green Building Standards Code, Section A5.106.5.3.2. Considering that trucking activities constitute a major operational activity for the proposed project, the Tier 2 EV charging infrastructure requirements contained in MM GHG-1e would apply to both passenger automobile as well as truck parking areas. Loading docks would also be required under MM GHG-1e to contain 240-volt outlets to accommodate EV and TRU charging while trucks are loading or unloading goods. The inclusion of MM GHG-1e would ensure that the proposed project meets the provision requiring compliance with the Tier 2 EV charging infrastructure of CALGreen. MM GHG-1e would further reduce the potential for the wasteful, inefficient, or unnecessary consumption of energy resources from automobiles by supporting the region and State's adoption of EVs and reducing reliance on fossil fuels.

As a result, the proposed project's energy consumption would not be wasteful, inefficient, or unnecessary. Impacts would be less than significant with mitigation.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

MM GHG-1a through MM GHG-1e

Level of Significance After Mitigation

Less than significant impact.

Impact GHG-4: The proposed project would conflict with or obstruct a State or local plan for renewable energy or energy efficiency?

Impact Analysis

A significant impact would occur if the proposed project conflicted with or obstructs a State or local plan for renewable energy or energy efficiency. Therefore, a significant impact would occur if the proposed project were considered inconsistent with applicable plans adopted to promote or improve energy efficiency or renewable energy, including the City's EECAP. In addition, the City's General Plan Natural and Historic and Cultural Resources Element contains several energy efficiency goals that would relate to the proposed project.

The proposed project would be designed in accordance with Title 24, California's Energy Efficiency Standards for Nonresidential Buildings techniques and practices. These standards include minimum energy efficiency requirements related to building envelope, mechanical systems (e.g., heating, ventilation, and air conditioning [HVAC] and water heating systems), and indoor and outdoor lighting. Incorporating the Title 24 standards into the proposed project's design would ensure that the proposed project would not result in the use of energy in a wasteful manner. Furthermore, the proposed project would have roof structures designed to accommodate additional weight for rooftop photovoltaic electricity generation panel arrays, so it is possible that the project could use solar electricity generation. MM GHG-1d would also require the proposed project to source its electricity from 100 percent carbon-free sources, which could include on-site renewable generation technologies such as rooftop solar.

The City's General Plan Natural and Historic and Cultural Resources Element contains policies related to energy conservation that are relevant to the proposed project, such as Goal 8F to reduce consumption of nonrenewable energy sources and support the development and utilization of new energy sources. Compliance with Title 24 standards would help the project meet this goal, and implementation of MMs GHG-1a through GHG-1e would further serve to reduce project reliance on nonrenewable energy resources. Moreover, as previously illustrated in Table 3.6-5, the proposed project would be consistent with the energy efficiency measures contained in the EECAP.

The proposed project would comply with existing State energy standards and be consistent with the energy efficiency goals and measures contained in the City's General Plan Natural and Historic and Cultural Resources Element and EECAP. As such, the proposed project would not conflict with State or local renewable or energy efficiency objectives. Impacts would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation is necessary.

Level of Significance After Mitigation

Less than significant impact.