

3.7 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

This section presents a summary of the current state of climate change science and greenhouse gas (GHG) emissions sources in California; a summary of applicable regulations; quantification of GHG emissions generated by the Project; and discussion of the Project's potential contribution to global climate change. Where impacts are found to be potentially significant, mitigation is recommended. The primary source of information used for this analysis is Section 5.7, "Greenhouse Gas Emissions and Energy," from the City of Elk Grove General Plan Update Draft Environmental Impact Report (General Plan EIR) (City of Elk Grove 2018). Notably, the aforementioned section evaluated potential adverse energy impacts. Energy impacts are evaluated in Section 3.5, "Energy," of this Draft SEIR.

For the purposes of this analysis, GHG emissions are measured as metric tons of carbon dioxide equivalent (MTCO_{2e}). The atmospheric impact of a GHG is based on the global warming potential (GWP) of that gas. GWP is a measure of the heat trapping ability of one unit of a gas over a certain timeframe relative to one unit of carbon dioxide (CO₂). The GWP of CO₂ is one (IPCC 2014). Consistent with the methodology used by the California Air Resources Board (CARB) in estimating statewide GHG emissions, this analysis uses GWP values from the Fourth Assessment Report Values by the Intergovernmental Panel on Climate Change (IPCC) (Greenhouse Gas Protocol No Date).

No comments pertaining to GHGs and climate change were received in response to the notice of preparation (NOP).

3.7.1 Regulatory Setting

FEDERAL

In *Massachusetts et al. v. Environmental Protection Agency et al.*, 549 U.S. 497 (2007), the Supreme Court of the United States ruled that CO₂ is an air pollutant as defined under the federal Clean Air Act (CAA) and that the U.S. Environmental Protection Agency (EPA) has the authority to regulate GHG emissions. In 2010, EPA started to address GHG emissions from stationary sources through its New Source Review permitting program, including operating permits for "major sources" issued under Title V of the CAA.

However, on April 2, 2018, the EPA administrator announced a final determination that the current standards should be revised. On August 2, 2018, the U.S. Department of Transportation and EPA proposed the Safer Affordable Fuel-Efficient Vehicles Rule (SAFE Rule), which would amend existing CAFE standards for passenger cars and light-duty trucks by increasing the stringency of the standards by 1.5 percent per year from models 2021 through 2026 (NHTSA 2020).

The CAA grants California the ability to enact and enforce more strict fuel economy standards through the acquisition of an EPA-issued waiver. Each time California adopts a new vehicle emission standard, the state applies to EPA for a preemption waiver for those standards. However, Part One of the SAFE Rule, which became effective on November 26, 2019, revokes California's existing waiver to implement its own vehicle emission standard and also established a standard to be adopted and enforced nationwide (84 Federal Register [FR] 51310). At the time of preparing this SEIR, the implications of the SAFE Rule on California's future emissions are contingent upon a variety of unknown factors, including legal challenges by California and other states to the revocation of California's waiver, direction provided by federal leadership, and future cabinet and bureaucratic appointments. However, the impact analysis included in this chapter assumes that the SAFE Rule would continue to be implemented, and uses emissions factors developed by CARB that account for the potential for a less fuel-efficient future vehicle fleet as a result of the SAFE Rule (CARB 2019a).

In June 2019, EPA, under the authority of the CAA section 111(d), issued the Affordable Clean Energy rule which provides guidance to states on establishing emissions performance standards for coal-fired electric generating units (EGUs). Under this rule, states are required to submit plans to EPA which demonstrate the use of specifically listed retrofit technologies and operating practices to achieve CO₂ emission reductions through heat rate improvement (HRI). HRI is a measurement of power plant efficiency that EPA determined as part of this rulemaking to be the best system of emission reductions for CO₂ generated from coal-fired EGUs (EPA 2019a).

STATE

Statewide GHG Emission Targets and Climate Change Scoping Plan

Reducing GHG emissions in California has been the focus of the State government for approximately two decades. GHG emission targets established by the State legislature include reducing statewide GHG emissions to 1990 levels by 2020 (Assembly Bill [AB] 32 of 2006) and reducing them to 40 percent below 1990 levels by 2030 (Senate Bill [SB] 32 of 2016). Executive Order S-3-05 calls for statewide GHG emissions to be reduced to 80 percent below 1990 levels by 2050. Executive Order B-55-18 calls for California to achieve carbon neutrality by 2045 and achieve and maintain net negative GHG emissions thereafter. These targets are in line with the scientifically established levels needed in the U.S. to limit the rise in global temperature to no more than 2 degrees Celsius, the warming threshold at which major climate disruptions, such as super droughts and rising sea levels, are projected; these targets also pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius (United Nations 2015).

California's 2017 Climate Change Scoping Plan (2017 Scoping Plan), prepared by CARB, outlines the main strategies California will implement to achieve the legislated GHG emission target for 2030 and “substantially advance toward our 2050 climate goals” (CARB 2017). It identifies the reductions needed by each GHG emission sector (e.g., transportation, industry, electricity generation, agriculture, commercial and residential, pollutants with high global warming potential, and recycling and waste). CARB and other state agencies also released the *January 2019 Draft California 2030 Natural and Working Lands Climate Change Implementation Plan* consistent with the carbon neutrality goal of Executive Order B-55-18 (California Environmental Protection Agency et al. 2019).

The State has also passed more detailed legislation addressing GHG emissions associated with transportation, electricity generation, and energy consumption, as summarized below.

Transportation-Related Standards and Regulations

As part of its Advanced Clean Cars program, CARB established more stringent GHG emission standards and fuel efficiency standards for fossil fuel-powered on-road vehicles than EPA. In addition, the program's zero-emission vehicle (ZEV) regulation requires battery, fuel cell, and plug-in hybrid electric vehicles (EVs) to account for up to 15 percent of California's new vehicle sales by 2025 (CARB 2018a). When the rules are fully implemented by 2025, GHG emissions from the statewide fleet of new cars and light-duty trucks will be reduced by 34 percent and cars will emit 75 percent less smog-forming pollution than the statewide fleet in 2016 (CARB 2016a).

Executive Order B-48-18, signed into law in January 2018, requires all State entities to work with the private sector to have at least 5 million ZEVs on the road by 2030, as well as 200 hydrogen-fueling stations and 250,000 EV-charging stations installed by 2025. It specifies that 10,000 of these charging stations must be direct-current fast chargers.

The CCA requires that a waiver be provided by EPA for states to enact more stringent emissions standards for new cars, which was granted to CARB by EPA on June 14, 2011; however, in addition to the SAFE Rule, but as a separate action, on September 19, 2019, EPA issued a final action entitled the “One National Program Rule” which would institute a nationwide, uniform fuel economy and GHG standard for all automobiles and light-duty trucks (EPA 2019b). The action would include the revocation of California's waiver under the CCA which would affect the enforceability of CARB's ZEV programs. While EPA has issued an action to revoke the waiver, the outcome of any related lawsuits and how such lawsuits could delay or affect the SAFE Rule implementation or CARB's ZEV programs is unknown at this time.

CARB adopted the Low Carbon Fuel Standard (LCFS) in 2007 to reduce the carbon intensity (CI) of California's transportation fuels. Low-CI fuels emit less CO₂ than other fossil fuel-based fuels such as gasoline and fossil diesel. The LCFS applies to fuels used by on-road motor vehicles and off-road vehicles, including construction equipment (Wade, pers. comm., 2017).

In addition to regulations that address tailpipe emissions and transportation fuels, the State legislature has passed regulations to address the amount of driving by on-road vehicles. Since passage of SB 375 in 2008, CARB requires metropolitan planning organizations (MPOs) to develop and adopt sustainable communities strategies (SCSs) as a component of the federally-prepared regional transportation plans (RTPs) to show reductions in GHG emissions from

passenger cars and light-duty trucks in their respective regions for 2020 and 2035. These plans link land use and housing allocation to transportation planning and related mobile-source emissions. The Sacramento Area Council of Governments (SACOG) serves as the MPO for Sacramento, Placer, El Dorado, Yuba, Sutter, and Yolo counties, excluding those lands located in the Tahoe Basin. The Project site is in Sacramento County. Under SB 375, SACOG adopted a Metropolitan Transportation Plan/Sustainable Communities Strategy 2035 (MTP/SCS) in 2016. SACOG was tasked by CARB to achieve a 7-percent per capita reduction compared to 2012 emissions by 2020 and a 16-percent per capita reduction by 2035, both of which CARB confirmed the region would achieve by implementing the MTP/SCS (CARB 2016b). In March 2018, CARB promulgated revised targets tasking SACOG to achieve a 7-percent and a 19-percent per capita reduction by 2020 and 2035, respectively (CARB 2018b). SACOG completed and adopted its most recent 2020 MTP/SCS in November 2019 (SACOG 2019).

SB 743 of 2013 required that OPR propose changes to the State CEQA Guidelines to address transportation impacts in transit priority areas and other areas of the State. In response, Section 15064.3 was added to CEQA in December 2018, requiring that transportation impacts no longer consider congestion but instead focus on the impacts of vehicle miles traveled (VMT). More detail about SB 743 is provided in the “Regulatory Setting” section of Section 3.13., “Transportation., of this Draft SEIR.

Legislation Associated with Electricity Generation

The State has passed legislation requiring the increasing use of renewables to produce electricity for consumers. California utilities are required to generate 33 percent of their electricity from renewables by 2020 (SB X1-2 of 2011); 52 percent by 2027 (SB 100 of 2018); 60 percent by 2030 (also SB 100 of 2018); and 100 percent by 2045 (also SB 100 of 2018).

Building Energy Efficiency Standards (Title 24, Part 6)

The energy consumption of new residential and nonresidential buildings in California is regulated by the California Code of Regulations Title 24, Part 6, Building Energy Efficiency Standards (California Energy Code). The California Energy Commission (CEC) updates the California Energy Code every three years with more stringent design requirements for reduced energy consumption, which results in the generation of fewer GHG emissions. The current California Energy Code will require builders to use more energy-efficient building technologies for compliance with increased restrictions on allowable energy use. CEC estimates that the combination of required energy-efficiency features and mandatory solar panels in the 2019 California Energy Code will result in new residential buildings that use 53 percent less energy than those designed to meet the 2016 California Energy Code. CEC also estimates that the 2019 California Energy Code will result in new commercial buildings that use 30 percent less energy than those designed to meet the 2016 standards, primarily through the transition to high-efficacy lighting (CEC 2018).

LOCAL

Sacramento Metropolitan Air Quality Management District

The Sacramento Metropolitan Air Quality Management District (SMAQMD) is the primary agency responsible for addressing air quality concerns in all of Sacramento County—its role is discussed further in Section 3.2, “Air Quality,” of this Draft SEIR. SMAQMD also recommends methods for analyzing project-generated GHGs in CEQA analyses and offers multiple potential GHG reduction measures for land use development projects. SMAQMD developed thresholds of significance to provide a uniform scale to measure the significance of GHG emissions from land use and stationary source projects in compliance with CEQA (SMAQMD 2020a). SMAQMD’s goals in developing GHG thresholds include ease of implementation; use of standard analysis tools; and emissions mitigation consistent with the statewide GHG targets mandated by AB 32 of 2006. However, since the establishment of new statewide GHG target of 40 percent below 1990 levels by 2030 with passage of SB 32 in 2016, SMAQMD has not developed new thresholds that align with this statewide GHG target. SMAQMD provides guidance for program-level analysis of general plans and area plans. The Project would meet the criteria of a General Plan Element Update and therefore, SMAQMD’s guidance will be used in this analysis (SMAQMD 2020b).

City of Elk Grove General Plan

The City of Elk Grove General Plan contains the following policies and standards related to climate change that apply to the Project (City of Elk Grove 2019a):

- ▶ **Policy NR-5-2:** Improve the health and sustainability of the community through improved regional air quality and reduction of greenhouse gas emissions that contribute to climate change.
- ▶ **Policy NR-6-1:** Promote energy efficiency and conservation strategies to help residents and businesses save money and conserve valuable resources.
- ▶ **Policy NR-6-3:** Promote innovation in energy efficiency.
- ▶ **Policy NR-6-5:** Promote energy conservation measures in new development to reduce on-site emissions and seek to reduce the energy impacts from new residential and commercial projects through investigation and implementation of energy efficiency measures during all phases of design and development.
- ▶ **Policy NR-6-6:** Encourage renewable energy options that are affordable and benefit all community members.
- ▶ **Policy NR-6-7:** Encourage the use of solar energy systems in homes, commercial businesses, and City facilities as a form of renewable energy.
- ▶ **Policy H-2-3:** Support energy-conserving programs in the production and rehabilitation of affordable housing to reduce household energy costs, improve air quality, and mitigate potential impacts of climate change in the region.
- ▶ **Policy ER-6-11:** Seek to provide the community with information relating to sustainability, climate change, and innovative development strategies.

City of Elk Grove Climate Action Plan

The City Climate Action Plan 2019 Update (CAP), adopted in February 2019 and amended in December 2019 by the City, was incorporated into the current General Plan (discussed above). The CAP includes GHG emission reduction targets, strategies, and implementation measures developed to help the City reach these targets. Reduction strategies address GHG emissions associated with transportation and land use, energy, water, waste management and recycling, agriculture, and open space. Through the deployment of measures included in the CAP, as well as reductions achieved by Statewide regulatory schemes, consistent with direction from SB 32, the City would achieve a per capita emissions target of 4.1 MTCO₂e per year by 2030; however, based on projection within the CAP, the City would be expected to reduce per capita emissions to 3.0 MTCO₂e per year by 2050, which exceeds the State's 2050 reduction target of 1.4 MTCO₂e per year (City of Elk Grove 2019b:4-3). As discussed in the CAP, "additional technological advances across multiple sectors would be required to reduce emission further, combined with additional regulatory actions at the State or federal levels." Further, the City "would identify new or modified GHG reduction measures that would achieve longer-term, post-2030 targets that may be set by the State or others in the future" (City of Elk Grove 2018:5.7-37). The following GHG reduction action would apply to new residential development under the Project:

- ▶ **BE-1. Building Stock: Promote Energy Conservation.** Promote energy conservation by residents and businesses in existing structures in close coordination with other agencies and local energy providers, including the Sacramento Municipal Utility District (SMUD) and Pacific Gas and Electric (PG&E).
- ▶ **BE-4. Building Stock: Encourage or Require Green Building Practices in New Construction.** Encourage new construction projects to comply with CALGreen Tier 1 standards, including a 15 percent improvement over minimum Title 24 Part 6 Building Energy Efficiency Standards. For projects that the City determines are not exempt from CEQA (i.e., an environmental document is required) and that qualify for project-level GHG analysis streamlining under CEQA Guidelines Section 15183.5, compliance with CALGreen Tier 1 may be required as a mitigation measure, unless other measures are determined by the City to achieve equivalent GHG reductions such that the CAP remains on track to achieving the overall GHG reduction target.

- ▶ **BE-5. Building Stock: Phase in Zero Net Energy Standards in New Construction.** Phase in zero net energy (ZNE) standards for new construction, beginning in 2020 for residential projects and 2030 for commercial projects. Specific phase-in requirements and ZNE compliance standards will be supported by updates in the triennial building code updates, beginning with the 2019 update.
- ▶ **BE-6. Building Stock: Electrification in New and Existing Residential Development.** Encourage and incentivize new residential developments to include all-electrical appliances and HVAC systems in the design of new projects. Support local utilities in implementing residential retrofit programs to help homeowners convert to all electrical appliances and HVAC systems. Explore the feasibility of phasing in minimum standards for all-electric developments. For certain projects that the City determines are not exempt from CEQA (i.e., an environmental document is required) and that qualify for project-level GHG analysis streamlining under CEQA Guidelines Section 15183.5, compliance with this measure may be required as a mitigation measure, unless other measures are determined by the City to achieve equivalent GHG reductions such that the CAP remains on track to achieving the overall GHG reduction target.
- ▶ **BE-7. Building Stock: Solar Photovoltaics in New and Existing Residential and Commercial Development.** Encourage and require installation of on-site solar photovoltaic (PV) in new single-family and low-rise multi-family developments. Promote installation of on-site PV systems in existing residential and commercial development.
- ▶ **BE-8. SMUD Greenergy and SolarShares Programs.** Encourage participation in SMUD's offsite renewable energy programs (i.e., Greenergy, SolarShares), which allow building renters and owners to opt into cleaner electricity sources.
- ▶ **ACM-5. Affordable Housing.** Continue to promote and require the development of affordable housing in the City.

3.7.2 Environmental Setting

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the atmosphere from space. A portion of the radiation is absorbed by the earth's surface, and a smaller portion of this radiation is reflected toward space. The absorbed radiation is then emitted from the earth as low-frequency infrared radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth.

Prominent GHGs contributing to the greenhouse effect are CO₂, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Human-caused emissions of these GHGs in excess of natural ambient concentrations are found to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcing (IPCC 2014).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas most pollutants with localized air quality effects have relatively short atmospheric lifetimes (approximately 1 day), GHGs have long atmospheric lifetimes (1 year to several thousand years). GHGs persist in the atmosphere long enough to be dispersed around the globe. Although the lifetime of any GHG molecule depends on multiple variables and cannot be determined with any certainty, it is understood that more CO₂ is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. Of the total annual human-caused CO₂ emissions, approximately 55 percent are estimated to be sequestered through ocean and land uptake every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO₂ emissions remain stored in the atmosphere (IPCC 2013).

The quantity of GHGs in the atmosphere responsible for climate change is not precisely known, but it is considered to be enormous. No single project alone would measurably contribute to an incremental change in the global average temperature or to global or local climates or microclimates. From the standpoint of CEQA, GHG impacts relative to global climate change are inherently cumulative.

GREENHOUSE GAS EMISSION SOURCES

As discussed previously, GHG emissions are attributable in large part to human activities. The total GHG inventory for California in 2017 was 424 MMTCO_{2e}(CARB 2019b). This is less than the 2020 target of 431 MMTCO_{2e} (CARB 2019b).

A GHG inventory for the City is provided in the City's CAP and summarized in Table 3.7-2. As shown below, on-road vehicles and residential, commercial, and industrial energy consumption constitute the greatest sources of emissions.

Table 3.7-2 City of Elk Grove's Greenhouse Gas Emissions Inventory for 2013 and Business-as-Usual Forecast Years (MTCO_{2e})

Emissions Sector	2013	2020	2030	2050
On-Road Vehicles	730,340	645,542	844,317	1,241,867
Residential Energy	231,400	257,171	310,017	413,560
Commercial/Industrial Energy	129,860	147,685	196,037	293,532
Off-Road Vehicles	93,340	102,776	123,896	165,275
Solid Waste	26,260	36,181	39,817	47,781
Wastewater	3,854	4,283	5,163	6,888
Water-Related	2,708	3,010	3,628	4,840
Agriculture	1,030	2,585	1,061	299
Total	918,790	1,199,232	1,523,936	2,174,042

Notes: Totals may not equal the sum of the numbers because of independent rounding.

MTCO_{2e} = metric tons of carbon dioxide equivalent.

Source: City of Elk Grove 2019b:Appendix A

As shown in Table 3.7-1, the transportation and building sectors are the largest GHG emission sectors in the City.

Emissions of CO₂ are byproducts of fossil fuel combustion. Methane, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices, landfills, and forest fires. Nitrous oxide is also largely attributable to agricultural practices and soil management. CO₂ sinks, or reservoirs, include vegetation and the ocean, which absorb CO₂ through sequestration and dissolution (CO₂ dissolving into the water) and are two of the most common processes for removing CO₂ from the atmosphere.

EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT

According to IPCC, which was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme, global average temperature will increase by 3.7 to 4.8 degrees Celsius (°C) (6.7 to 8.6 degrees Fahrenheit [°F]) by the end of the century unless additional efforts to reduce GHG emissions are made (IPCC 2014:10). According to *California's Fourth Climate Change Assessment*, with global GHGs reduced at a moderate rate California will experience average daily high temperatures that are warmer than the historic average by 2.5 °F from 2006 to 2039, by 4.4 °F from 2040 to 2069, and by 5.6 °F from 2070 to 2100; and if GHG emissions continue at current rates then California will experience average daily high temperatures that are warmer than the historic average by 2.7 °F from 2006 to 2039, by 5.8 °F from 2040 to 2069, and by 8.8 °F from 2070 to 2100 (OPR et al. 2018).

Since its previous climate change assessment in 2012, California has experienced several of the most extreme natural events in its recorded history: a severe drought from 2012–2016, an almost non-existent Sierra Nevada winter snowpack in 2014–2015, increasingly large and severe wildfires, and back-to-back years of the warmest average temperatures (OPR et al. 2018). According to California Natural Resource Agency's *Safeguarding California Plan: 2018 Update*, California experienced the driest 4-year statewide precipitation on record from 2012 through 2015; the warmest years on average in 2014, 2015, and 2016; and the smallest and second smallest Sierra snowpack on record in 2015 and 2014 (CNRA 2018). According to the National Oceanic and Atmospheric Administration and the National Aeronautics and Space Administration, 2016, 2017, and 2018 were the hottest recorded years in history (NOAA 2019). In contrast, the northern Sierra Nevada experienced one of its wettest years on record during the 2016–2017 water year (CNRA 2018). The changes in precipitation exacerbate wildfires throughout California through a cycle of high vegetative growth coupled with dry, hot periods which lowers the moisture content of fuel loads. As a result, the frequency, size, and devastation of forest fires has increased. In November 2018, the Camp Fire completely destroyed the town of Paradise in Butte County and caused 85 fatalities, becoming the state's deadliest fire in recorded history, and the largest fires in the state's history have occurred in the 2018–2020 period. Moreover, changes in the intensity of precipitation events following wildfires can also result in devastating landslides. In January 2018, following the Thomas Fire, 0.5 inch of rain fell in 5 minutes in Santa Barbara causing destructive mudslides formed from the debris and loose soil left behind by the fire. These mudslides resulted in 21 deaths.

As temperatures increase, the amount of precipitation falling as rain rather than snow also increases, which could lead to increased flooding because water that would normally be held in the snowpack of the Sierra Nevada and Cascade Range until spring would flow into the Central Valley during winter rainstorm events. This scenario would place more pressure on California's levee/flood control system (CNRA 2018). Furthermore, in the extreme scenario involving the rapid loss of the Antarctic ice sheet and the glaciers atop Greenland, the sea level along California's coastline is expected to rise 54 inches by 2100 if GHG emissions continue at current rates (OPR et al. 2018).

Temperature increases and changes to historical precipitation patterns will likely affect ecological productivity and stability. Existing habitats may migrate from climatic changes where possible, and those habitats and species that lack the ability to retreat will be severely threatened. Altered climate conditions will also facilitate the movement of invasive species to new habitats thus outcompeting native species. Altered climatic conditions dramatically endanger the survival of arthropods (e.g., insects, spiders) which could have cascading effects throughout ecosystems (Lister and Garcia 2018). Conversely, a warming climate may support the populations of other insects such as ticks and mosquitos, which transmit diseases harmful to human health such as the Zika virus, West Nile virus, and Lyme disease (European Commission Joint Research Centre 2018).

Changes in temperature, precipitation patterns, extreme weather events, wildfires, and sea-level rise have the potential to threaten transportation and energy infrastructure, crop production, forests and rangelands, and public health (CNRA 2018; OPR et al. 2018). The effects of climate change will also have an indirect adverse impact on the economy as more severe natural disasters cause expensive, physical damage to communities and the state.

Additionally, adjusting to the physical changes associated with climate change can produce mental health impacts such as depression and anxiety.

3.7.3 Environmental Impacts and Mitigation Measures

METHODOLOGY

The following impact analysis is based primarily on review of the information and analysis presented in the General Plan EIR then compared to Project-related modeling performed for this analysis. Where the General Plan EIR concluded that there would be no impacts or impacts would be less than significant, impacts are not evaluated in detail herein.

The analysis in this section is consistent with the recommendations of the SMAQMD's Guide to Air Quality Assessment in Sacramento County, Chapter 9, Program-Level Analysis of General Plans and Area Plans (SMAQMD 2020b). The analysis primarily focuses on the extent to which the Project would conflict with a plan for reduction of

GHG emissions as defined by CEQA Guidelines Section 15183.5. Both short-term construction emissions and long-term operational emissions were calculated using the California Emissions Estimator Model (CalEEMod), version 2016.3.2, computer program.

SMAQMD recommends that construction emissions be estimated for program levels of analysis consistent with guidance provided for project-level analyses. As indicated in Chapter 2, "Project Description," the proposed Housing Element Update identifies a range of housing sites that would meet the RHNA for the City. Regional projections by SACOG estimate a need for an additional 8,263 housing units in Elk Grove by 2029. There is uncertainty surrounding the schedule and exact location of where development will occur, therefore, construction emissions were modeled using the assumptions that development would occur gradually over the 8-year period of the Housing Element Update (2021–2029). The acreages and the potential housing units under the proposed Housing Element Update were used. Due to the programmatic nature of this analysis, CalEEMod default values for trip generation, heavy-duty equipment type, and construction phasing were used. Total construction emissions were then amortized over a 40-year lifetime of the Project, which is a methodology supported by the SMAQMD for residential land uses (SMAQMD 2020a).

With respect to operational emissions, mobile source emissions were estimated using Project-estimated annual VMT derived from the traffic study prepared for the Project (see Section 3.13, "Transportation"). Energy-, area-, solid waste-, and water-sourced emissions were estimated using CalEEMod default values; however, energy-related estimates were adjusted to demonstrate consistency with the 2019 California Energy Code. These emissions are disclosed for informational purposes.

The City updated its CAP concurrently with the General Plan in 2019. The CAP update is intended to carry out the 2019 General Plan goals and policies to reduce GHG emissions and address the impacts of climate change. The City's GHG emissions inventory and forecasts have been updated to reflect new activity data and both current and projected population, housing, and employment demographic information consistent with the General Plan. The CAP update includes new GHG emissions reduction targets of 7.6 MTCO₂e per capita by 2020, and 4.1 MTCO₂e per capita by 2030. These targets are consistent with guidance provided to local governments in the 2017 Scoping Plan on setting plan-level GHG reduction goals that are consistent with the state's efforts to achieve the 2030 target established by SB 32. Consistency with the 2019 CAP is evaluated in this analysis.

Detailed model assumptions and inputs for these calculations are presented in Appendix B.

THRESHOLDS OF SIGNIFICANCE

The issue of global climate change is inherently a cumulative issue because the GHG emissions of individual projects cannot be shown to have any material effect on global climate. Thus, the Project's impact on climate change is addressed only as a cumulative impact.

The significance criteria used to evaluate project impacts on climate change under CEQA are based on Section 15064 of the CEQA statute and relevant portions of Appendix G of the State CEQA Guidelines, which recommend that a lead agency consider a project's consistency with relevant, adopted plans and discuss any inconsistencies with applicable regional plans, including plans to reduce GHG emissions. Implementation of a project would result in a cumulatively considerable contribution to climate change if it would:

- ▶ generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- ▶ conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

With respect to GHG emissions, the CEQA Guidelines Section 15064.4(a) states that lead agencies "shall make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate" GHG emissions resulting from a project. The CEQA Guidelines note that an agency has the discretion to either quantify a project's GHG emissions or rely on a "qualitative analysis or performance-based standards" (Section 15064.4[a]). A lead agency may use a "model or methodology" to estimate GHG emissions and has the 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" (Section 15064.4[c]). The CEQA Guidelines provide that the lead agency should consider the following when determining the significance of impacts from GHG emissions on the environment (Section 15064.4[b]):

1. The extent a project may increase or reduce GHG 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 GHG emissions.

CEQA Guidelines Appendix G is a sample Initial Study checklist that includes a number of factual inquiries related to the subject of climate change, as it does on a whole series of additional environmental topics. Notably, lead agencies are under no obligation to use these inquiries in fashioning thresholds of significance on these subjects, or indeed on any subject addressed in the checklist. (*Save Cuyama Valley v. County of Santa Barbara* (2013) 213 Cal.App.4th 1059, 1068.) Rather, with few exceptions, "CEQA grants agencies discretion to develop their own thresholds of significance." (*Ibid.*) Even so, it is a common practice for lead agencies to take the language from the inquiries set forth in Appendix G and to use that language in fashioning thresholds. The City has done so here.

Since California's legislative mandate to reduce total projected GHG emissions to 1990 levels by the year 2020 has been achieved, the focus is now on reducing emissions 40 percent below 1990 levels by the year 2030. SB 32 codified the mandate to reduce emissions by 40 percent below 1990 levels by 2030. To achieve this target, future development must be planned and implemented in the most GHG-efficient manner possible. GHG-efficient development reduces VMT by supporting compact, dense, mixed-use, pedestrian and bicycle-friendly, transit-oriented development. Development that reduces VMT by shifting car trips to walking, biking and transit use also imparts numerous public health co-benefits, such as increases in rates of routine physical activity and corresponding reductions in rates of obesity, diabetes, hypertension, and other chronic conditions; fewer injuries and deaths from traffic collisions; and more direct visual surveillance of the urban environment, which leads to reduced rates of crime and violence. Local agencies are strongly encouraged to address GHG emissions when updating and/or adopting general and area plans. The general plan is perhaps the best venue for addressing GHG emissions in making meaningful progress toward attaining GHG reduction goals while addressing CEQA requirements.

As stated previously, the 2019 Elk Grove General Plan was prepared in conjunction with the City's 2019 CAP. The CAP is a qualified plan that has service metric targets for 2030 pursuant to the statewide reduction goals set forth by SB 32. 2030 is the projected first full year of operation of the housing proposed under the Project; therefore, to determine the potential significance of the Project, the Project will be evaluated for its consistency with the 2019 CAP. For the purposes of determining the significance of the Project, the Project would result in a cumulatively considerable contribution to climate change if it would:

- ▶ conflict with the GHG reduction measures contained in the 2019 CAP.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Impact 3.7-1: Project-Generated GHG Emissions

The General Plan EIR determined that GHG-related impacts would be less than significant through the incorporation of GHG reduction actions included in the General Plan and 2019 CAP (Impact 5.7.1) but would not likely meet long term reduction goals under Executive Order S-3-05 and result in a significant and unavoidable impact (Impact 5.7.2). Construction and operation of the existing and candidate housing sites under the Housing Element Update would generate an estimated 35,769 MTCO₂e/year in 2030, the assumed first full year of Project operation. Consistent with the findings of the General Plan EIR, new housing resulting from the implementation of the Housing Element Update would be subject to the policies contained in the 2019 CAP and 2019 General Plan, which would demonstrate consistency with statewide GHG reduction goals set forth by SB 32. Implementation of the Housing Element Update would introduce housing sites of greater density and development beyond what was included in the General Plan as analyzed in the General Plan EIR. The Project, as it includes as a component of the General Plan, would alter the rate that operational emissions would be generated. However, because the residential development under the Housing Element Update would be subject to applicable measures in the CAP, Project emissions would be reduced consistent with statewide GHG reduction goals by 2030. This impact would not result in a new or substantially more severe impact than what was addressed in the General Plan EIR. Project impacts would be **less than significant**.

Construction-related activities associated with the Housing Element Update would generate GHG emissions from the use of heavy-duty off-road equipment, materials transport, and worker commute. Based on modeling conducted for the Project, the Project would generate an estimated total 36,677 MTCO₂e from construction activity. These emissions amortized over the life of the Project (i.e., 40 years) would be 917 MTCO₂e/year. Refer to Appendix B for detailed construction modeling inputs and parameters. Notably, the Safety Element Update could also generate emissions of GHGs from construction of new infrastructure to support evacuation and emergency access improvements and vehicles associated with police, fire, and emergency medical services; however, the acreage, intensity, duration, and location of these construction activities is unknown at this time and not accounted for in this analysis.

Operation of the Project would directly generate GHG emissions from vehicle movement to and from the project site, on-site natural gas consumption (e.g., stoves, fireplaces, water heaters), and use of landscaping equipment. GHGs would be indirectly emitted from electricity consumption, solid waste disposal at landfills, and water and wastewater treatment.

Table 3.7-2 summarizes the anticipated level of emissions for the Project by emissions sector. Refer to Appendix B for detailed input parameters and assumptions.

Table 3.7-2 Greenhouse Gas Emissions of the Housing Element Update Housing Sites in 2030

Emissions Sector	MTCO ₂ e
Mobile Source	24,327
Energy Consumption ¹	8,137
Solid Waste Generation	1,333
Water Consumption and Wastewater Treatment	956
Area Sources	99
Amortized Construction Emissions ²	917
Total Operational GHG Emissions	35,769

Notes: Totals may not add due to rounding.

MTCO₂e = metric tons of carbon dioxide equivalent, MTCO₂e/year/SP = metric tons of carbon dioxide equivalent per year per service population.

¹ Energy was estimated in accordance with the 2019 California Energy Code (Part 6 of the Title 24 California Building Code). The California Energy Code is updated triennially and expected to enhance the energy efficiency and decarbonization of future development. With a construction period of 8 years, it is expected that energy consumption would decrease as buildings become more energy efficient and feature minimal or no on-site natural gas use.

² Construction emissions were amortized over the life of the Project (assumed 40 years, which is the assumed Project lifetimes consistent with methodology used by SMAQMD).

See Appendix B for detailed input parameters and modeling results.

Source: Modeled by Ascent Environmental in 2020

As shown in Table 3.7-2, operation of the Project would generate approximately 36,684 MTCO₂e/year in 2030, the assumed first full year of Project operation. Notably, these levels of emissions account for existing and candidate housing sites. The General Plan EIR's GHG emissions inventory included operational emissions from the existing and candidate sites identified in the previous Housing Element. Implementation of the Project would introduce new operational emissions from additional housing to meet regional population growth; however, as explained in the City's CAP, the projected GHG inventories for 2030 and 2050 contained assumptions pertaining to regional population growth, new households, and driving behavior.

Consistent with the analysis performed in the General Plan EIR, the Project would be beholden to the GHG reduction actions outlined in the 2019 CAP, which would reduce construction and operational emissions. Measures BE-1, BE-4, BE-5, BE-6, BE-7, BE-8, and ACM-5 from the 2019 CAP would apply to housing constructed as part of implementation of the Housing Element Update. Notably, the 2019 CAP measures that target GHG reductions from City-owned municipal facilities and infrastructure and existing private development are not applicable to housing development but may be applicable for implementation of emergency access and evacuation routes under the Safety Element Update.

Additionally, Municipal Code Chapter 16.07 provides streamlined permitting for EV charging stations. Future development constructed and operated under the Housing Element Update that seeks to install EV charging stations would be entitled to use the streamlining mechanisms outlined in Municipal Code Chapter 16.07. Municipal Code Section 23.58.120 requires one "EV ready" parking space for all new one family and two family dwelling units. This section also requires that 2.5 percent of parking for multifamily projects provide EV charging and an additional 2.5 percent of parking be ready for future EV charging expansion. Compliance with these measures would be demonstrated in subsequent project building and site plan submittals for building permit approval and/or design review.

Although implementation of the Project would result in both direct and indirect GHG emissions, the 2019 CAP and associated General Plan policies would reduce emissions consistent with local GHG emissions reduction targets that were developed in consideration of the statewide 2030 reduction target established by SB 32 and the 2017 Scoping Plan. Unmitigated GHG emissions would increase under the Project due to the construction and operation of new housing; however, as stated previously, the CAP's future GHG forecast included new emissions from regional population growth, additional household, and changing in driving behaviors. The CAP measures were developed in consideration of this growth and adjusted accordingly to achieve the GHG reduction targets set forth by SB 32 and Executive Order S-3-05. As stated in the CAP, "[t]he City is also committed to updating the inventory, forecast, and reduction measures a minimum of once every five years. The City will use an implementation and monitoring tool to assist in tracking progress on CAP implementation and developing annual report for City Council presentations."

This commitment made by the City would ensure the efficacy of the CAP over time through identifying the GHG reduction actions that achieve the greatest reductions, removing or amending the existing GHG reduction actions that are not reducing emissions, and adding new GHG reduction actions in response to new technologies, practices, and feasibility. Additionally, future GHG inventories would account for new data pertaining to regional growth and housing needs, which is being met as an objective of the Project.

Therefore, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. There is no new significant effect and the impact is not more severe than the impact identified in the General Plan EIR. This impact would be **less than significant**.

Mitigation Measures

No additional mitigation is required beyond compliance with Measures BE-1, BE-4, BE-5, BE-6, BE-7, BE-8, and ACM-5 from the 2019 CAP and Municipal Code Chapter 16.07 and Section 23.58.120.

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