

## **4.15 CLIMATE CHANGE AND GREENHOUSE GASES**



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This section of the Draft Environmental Impact Report provides a discussion of the General Plan's and Climate Action Plan's effect on greenhouse gas emissions and the associated effects of climate change. The California Environmental Quality Act (CEQA) requires that lead agencies consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. The reader is referred to Section 4.2, Air Quality, for a discussion of project impacts associated with air quality.

### **4.15.1 EXISTING SETTING**

#### **EXISTING CLIMATE SETTING**

Cumulative impacts are the collective impacts of one or more past, present, and future projects, that, when combined, result in adverse changes to the environment. When the adverse change is substantial, the cumulative impact is considered significant. The cumulative project list for this issue (global climate change) comprises anthropogenic (i.e., man-made) greenhouse gas (GHG) emission sources across the entire globe. No project alone would cause any noticeable incremental change to the global climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context for GHG emissions and an enforceable statewide cap on GHG emissions. Even relatively small (on a global basis) additions need to be considered, and small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable (and therefore significant).

To fully understand global climate change it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric greenhouse gases, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide ( $\text{CO}_2$ ), methane ( $\text{CH}_4$ ), nitrous oxide ( $\text{N}_2\text{O}$ ), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ( $\text{SF}_6$ ).

For most non-industrial development projects, motor vehicles make up the bulk of GHG emissions produced on an operational basis. The primary greenhouse gases emitted by motor vehicles include carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons (CARB 2004). Following are descriptions of the primary greenhouse gases attributed to global climate change, including a description of their physical properties, primary sources, and contribution to the greenhouse effect.

#### **Carbon Dioxide**

Carbon dioxide ( $\text{CO}_2$ ) is a colorless, odorless gas.  $\text{CO}_2$  is emitted in a number of ways, both naturally and through human activities. The largest source of  $\text{CO}_2$  emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based

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products can also lead to CO<sub>2</sub> emissions. The atmospheric lifetime of CO<sub>2</sub> is variable because it is so readily exchanged in the atmosphere (EPA 2008).

### **Methane**

Methane (CH<sub>4</sub>) is a colorless, odorless gas that is not flammable under most circumstances. CH<sub>4</sub> is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (EPA 2006a).

### **Nitrous Oxide**

Nitrous oxide (N<sub>2</sub>O) is a clear, colorless gas with a slightly sweet odor. N<sub>2</sub>O is produced by both natural and human-related sources. Primary human-related sources of N<sub>2</sub>O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N<sub>2</sub>O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N<sub>2</sub>O is approximately 120 years (EPA 2006b).

### **Hydrofluorocarbons**

Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 260 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, which has an atmospheric life of 14 years) (EPA 2006c).

### **Perfluorocarbons**

Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and nontoxic. There are seven PFC gases: perfluoromethane (CF<sub>4</sub>), perfluoroethane (C<sub>2</sub>F<sub>6</sub>), perfluoropropane (C<sub>3</sub>F<sub>8</sub>), perfluorobutane (C<sub>4</sub>F<sub>10</sub>), perfluorocyclobutane (C<sub>4</sub>F<sub>8</sub>), perfluoropentane (C<sub>5</sub>F<sub>12</sub>), perfluorohexane (C<sub>6</sub>F<sub>14</sub>). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF<sub>4</sub> and C<sub>2</sub>F<sub>6</sub> as by-products. The estimated atmospheric lifetimes for CF<sub>4</sub> and C<sub>2</sub>F<sub>6</sub> are 50,000 and 10,000 years, respectively (EFCTC 2003; EPA 2006a).

### **Sulfur Hexafluoride**

Sulfur hexafluoride (SF<sub>6</sub>) is an inorganic compound that is colorless, odorless, nontoxic, and generally nonflammable. SF<sub>6</sub> is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF<sub>6</sub> produced worldwide.

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Significant leaks occur from aging equipment and during equipment maintenance and servicing. SF<sub>6</sub> has an atmospheric life of 3,200 years (EPA 2008b).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Gases with high global warming potential, such as HFCs, PFCs, and SF<sub>6</sub>, are the most heat-absorbent. Methane traps over 21 times more heat per molecule than CO<sub>2</sub>, and N<sub>2</sub>O absorbs 310 times more heat per molecule than CO<sub>2</sub>. Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO<sub>2</sub>e), which weight each gas by its global warming potential (GWP). Expressing GHG emissions in carbon dioxide equivalents takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO<sub>2</sub> were being emitted. **Table 4.15-1** shows the GWPs for different GHGs for a 100-year time horizon.

**TABLE 4.15-1**  
**GLOBAL WARMING POTENTIAL FOR GREENHOUSE GASES**

<b>Greenhouse Gas</b>	<b>Global Warming Potential</b>
Carbon Dioxide (CO <sub>2</sub> )	1
Methane (CH <sub>4</sub> )	21
Nitrous Dioxide (N <sub>2</sub> O)	310
Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs)	6,500
Sulfur Hexafluoride (SF <sub>6</sub> )	23,900

Source: BAAQMD 2006

As the name implies, global 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, respectively. California is the 12th to 16th largest emitter of CO<sub>2</sub> in the world and produced 492 million gross metric tons of carbon dioxide equivalents in 2004 (CEC 2006). Consumption of fossil fuels in the transportation sector was the single largest source of California's GHG emissions in 2004, accounting for 40.7 percent of total GHG emissions in the state (CEC 2006). This category was followed by the electric power sector (including both in-state and out-of-state sources) (22.2 percent) and the industrial sector (20.5 percent) (CEC 2006).

### **EFFECTS OF GLOBAL CLIMATE CHANGE**

California can draw on substantial scientific research conducted by experts at various state universities and research institutions. With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state — as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea level rise, and ecological shifts.

Many of these changes are accelerating – locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California will face intensifying climate changes in coming decades (CNRA 2009). Generally, research indicates that California should expect 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. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA 2009).

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Climate change temperature projections identified in the 2009 California Climate Adaptation Strategy suggest the following (CNRA 2009):

- Average temperature increase is expected to be more pronounced in the summer than in the winter season.
- Inland areas are likely to experience more pronounced warming than coastal regions.
- Heat waves are expected to increase in frequency, with individual heat waves also showing a tendency toward becoming longer, and extending over a larger area, thus more likely to encompass multiple population centers in California at the same time.
- As GHGs remain in the atmosphere for decades, temperature changes over the next 30 to 40 years are already largely determined by past emissions. By 2050, temperatures are projected to increase by an additional 1.8 to 5.4°F (an increase one to three times as large as that which occurred over the entire 20th century).
- By 2100, the models project temperature increases between 3.6 and 9°F.

Precipitation levels are expected to change over the 21st century, though models differ in determining where and how much rain and snowfall patterns will change (CNRA 2009). Eleven out of 12 precipitation models run by the Scripps Institution of Oceanography suggest a small to significant (12–35 percent) overall decrease in precipitation levels by mid-century (CNRA 2009). In addition, higher temperatures hasten snowmelt and increase evaporation and make for a generally drier climate. Moreover, the 2009 California Climate Adaptation Strategy concludes that more precipitation will fall as rain rather than as snow, with important implications for water management in the state. California communities have largely depended on runoff from yearly established snowpack to provide the water supplies during the warmer, drier months of late spring, summer, and early autumn. With rainfall and meltwater running off earlier in the year, the state will face increasing challenges of storing the water for the dry season while protecting Californians downstream from floodwaters during the wet season.

Changes in average temperature and precipitation are significant. Yet gradual changes in average conditions are not all for which California must prepare. In the next few decades, it is likely that the state will face a growing number of climate change-related extreme events such as heat waves, wildfires, droughts, and floods. Because communities, infrastructure, and other assets are at risk, such events can cause significant damages and are already responsible for a large fraction of near-term climate-related impacts every year (CNRA 2009).

Most climate projections developed to date, including those used in this report, produce gradual if sometimes substantial changes for a given climate variable. In the past, rapid climate changes have been observed and scientists are increasingly concerned about additional abrupt changes that could push natural systems past thresholds beyond which they could not recover. Such events have been recorded in paleoclimatological records but current global climate models cannot predict when they may occur again (CNRA 2009). Such abrupt changes have been shown to occur over very short periods of time (a few years to decades) and thus represent the most challenging situations to which society and ecosystems would need to adapt (CNRA 2009). Short of being able to predict such abrupt changes, scientists are focusing their attention on aspects of the climate and earth system called “tipping elements” that can rapidly bring about abrupt changes.

Tipping elements refer to thresholds where increases in temperature cause a chain reaction of mutually reinforcing physical processes in the earth's dynamic cycles. The most dangerous of these include the following (CNRA 2009):

- A reduction in Arctic sea ice, which allows the (darker) polar oceans to absorb more sunlight, thereby increasing regional warming, accelerating sea ice melting even further, and enhancing Arctic warming over neighboring (currently frozen) land areas.
- The release of methane (a potent GHG), which is currently trapped in frozen ground (permafrost) in the Arctic tundra, will increase with regional warming and melting of the ground, leading to further and more rapid warming and resulting in increased permafrost melting.
- Continued warming in the Amazon could cause significant rainfall loss and large scale dying of forest vegetation, which will further release CO<sub>2</sub>.
- The accelerated melting of Greenland and West Antarctic Ice Sheets observed in recent times, together with regional warming over land and in the oceans, involves mechanisms that can reinforce the loss of ice and increase the rate of global sea-level rise.

According to the 2009 California Climate Adaptation Strategy, the impacts of global warming in California have the potential to include, but are not limited to, the areas discussed below.

### **Public Health**

Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer than in winter months. Larger temperature increases are anticipated in inland communities as compared to the California coast. The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Numerous studies have indicated that there are generally more deaths during periods of sustained higher temperatures, and these are due to cardiovascular causes and other chronic diseases. The elderly, infants, and socially isolated people with pre-existing illnesses who lack access to air conditioning or cooling spaces are among the most at risk during heat waves (CNRA 2009).

### **Floods and Droughts**

The impacts of flooding can be significant. Results may include population displacement, severe psychosocial stress with resulting mental health impacts, exacerbation of pre-existing chronic conditions, and infectious disease (CNRA 2009). Additionally, impacts can include a loss of personal belongings, and the emotional ramifications from such loss, to direct injury and/or mortality.

Drinking water contamination outbreaks in the United States are associated with extreme precipitation events (CNRA 2009). Runoff from rainfall is also associated with coastal contamination that can lead to contamination of shellfish and contribute to food-borne illness. Flood waters may contain household, industrial and agricultural chemicals as well as sewage and animal waste. Flooding and heavy rainfall events can wash pathogens and chemicals from contaminated soils, farms, and streets into drinking water supplies (CNRA 2009). Flooding may

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also overload storm and wastewater systems, or flood septic systems, also leading to possible contamination of drinking water systems (CNRA 2009).

Drought impacts develop more slowly over time. Risks to public health that Californians may face from drought include impacts on water supply and quality, food production (both agricultural and commercial fisheries), and risks of waterborne illness. As the amount of surface water supplies are reduced as a result of drought conditions, the amount of groundwater pumping is expected to increase to make up for the water shortfall. The increase in groundwater pumping has the potential to lower the water tables and cause land subsidence (CNRA 2009). Communities that utilize well water will be adversely effected both by drops in water tables or through changes in water quality. Groundwater supplies have higher levels of total dissolved solids compared to surface waters. This introduces a set of effects for consumers, such as repair and maintenance costs associated with mineral deposits in water heaters and other plumbing fixtures, and on public water system infrastructure designed for lower salinity surface water supplies. Drought may also lead to increased concentration of contaminants in drinking water supplies (CNRA 2009).

### **Water Resources**

The state's water supply system already faces challenges to provide water for California's growing population. Climate change is expected to exacerbate these challenges through increased temperatures and possible changes in precipitation patterns. The trends of the last century — especially increases in hydrologic variability — will likely intensify in this century. We can expect to experience more frequent and larger floods and deeper droughts (CNRA 2009). Rising sea level will threaten the Delta water conveyance system and increase salinity in near-coastal groundwater supplies (CNRA 2009). Planning for and adapting to these simultaneous changes, particularly their impacts on public safety and long-term water supply reliability, will be among the most significant challenges facing water and flood managers this century.

### **Agriculture**

Increased GHG emissions could cause widespread changes to the agriculture industry, reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25 percent of the water supply they need. California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate ozone pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less than optimal development for many crops, so rising temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits, and nuts. In addition, continued global climate change could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the emerging gaps. Continued global climate change could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

### **Forests and Landscapes**

Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, wildfire occurrence statewide could increase from 57 percent to 169 percent by 2085 (CNRA 2009). However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state.

### **Rising Sea Levels**

Rising sea levels, more intense coastal storms, and warmer water temperatures could increasingly threaten the state's coastal regions. Over the 20th century, sea level has risen by about seven inches along the California coast (CNRA 2009). It is projected that sea level rise of up to 55 inches (1.4 meters) could occur by the end of this century (CNRA 2009). This projection accounts for the global growth of dams and reservoirs and how they can affect surface runoff into the oceans, but it does not account for the possibility of substantial ice melting from Greenland or the West Antarctic Ice Sheet, which would drive sea levels along the California coast even higher (CNRA 2009).

### **4.15.2 REGULATORY FRAMEWORK**

#### **FEDERAL**

##### **Federal Regulation and the Clean Air Act**

In the past, the U.S. Environmental Protection Agency (EPA) has not regulated greenhouse gases under the Clean Air Act (CAA) because it asserted that the act did not authorize it to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the increase in global surface air temperatures. However, the U.S. Supreme Court held that the EPA must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency et al.*, twelve states and cities, including California, together with several environmental organizations, sued to require the EPA to regulate GHGs as pollutants under the Clean Air Act (127 S. Ct. 1438 (2007)). The Court ruled that GHGs fit within the Clean Air Act's definition of a pollutant and that the EPA did not have a valid rationale for not regulating GHGs. In response to this ruling, the EPA has recently made an endangerment finding that GHGs pose a threat to the public health and welfare. This is the first step necessary for the establishment of federal GHG regulations under the Clean Air Act.

#### **STATE**

##### **Assembly Bill 1493**

Assembly Bill (AB) 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5), requires the California Air Resources Board (CARB) to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as "Pavley I." The California legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply, an increase in air pollution caused by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and

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economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the State is authorized to do under the CAA, to allow the State to require reduced tailpipe emissions of CO<sub>2</sub>. In late 2007, the EPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the State brought suit against the EPA related to this denial.

In January 2009, President Obama instructed the EPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the EPA granted California's waiver request enabling the State to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

Also in 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the United States. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon (mpg) by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

### **Executive Order S-3-05**

Executive Order S-3-05 (state of California, 2005) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (Cal-EPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of Cal-EPA created a Climate Action Team (CAT) made up of members from various state agencies and commissions. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

### **Assembly Bill 32, the California Global Warming Solutions Act of 2006**

Assembly Bill (AB) 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, etc.<sup>1</sup>) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, hydrofluorocarbons, perfluorocarbons, and sulfur

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<sup>1</sup> Assembly Bill 32 is codified at Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599.

hexafluoride. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

AB 32 does not explicitly apply to emissions from land development, though emissions associated with land development projects are closely connected to the utilities, transportation, and commercial end-use sectors. Further, because AB 32 imposes a statewide emissions cap, land development-related emissions will ultimately factor into consideration of greenhouse gas emissions in the state.

### **Climate Change Scoping Plan**

In October of 2008, CARB published its Climate Change Scoping Plan, which is the State's plan to achieve GHG reductions in California required by AB 32. The scoping plan contains the main strategies California will implement to achieve reduction of 169 million metric tons (MMT) of CO<sub>2</sub>e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO<sub>2</sub>e under a business-as-usual scenario (this is a reduction of 42 MMT CO<sub>2</sub>e, or almost 10 percent, from 2002–2004 average emissions). The scoping plan also includes CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations are from improving emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO<sub>2</sub>e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO<sub>2</sub>e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO<sub>2</sub>e), and a renewable portfolio standard for electricity production (21.3 MMT CO<sub>2</sub>e). CARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the proposed scoping plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. (Meanwhile, CARB is also developing an additional protocol for community emissions.) CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The proposed scoping plan states that the ultimate GHG reduction assignment to local government operations is to be determined. With regard to land use planning, the proposed scoping plan expects approximately 5.0 MMT CO<sub>2</sub>e will be achieved associated with implementation of SB 375, which is discussed further below. The Climate Change Scoping Plan was approved by CARB on December 11, 2008.

The timing of the implementation of the Climate Change Scoping Plan is currently uncertain as a result of a court decision in the case of *Association of Irritated Residents v. California Air Resources Board* (San Francisco Superior Court Case No. CPF-09-509562). The court found that

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CARB, in its CEQA review, had not adequately explained why it selected a scoping plan that included a cap and trade program rather than an alternative plan.

### **Senate Bill 1368**

Senate Bill (SB) 1368 (2006) (codified at Public Utilities Code Chapter 3) is the companion bill of AB 32. SB 1368 required the California Public Utilities Commission (CPUC) to establish a greenhouse gas emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The bill also required the California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural-gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

### **California Climate Action Registry**

The California Climate Action Registry (CCAR) was established in 2000 by Senate Bill 1771 (codified at Health and Safety Code Article 6 and Public Resources Code Chapter 8.5) and modified in 2001 by Senate Bill 527 (codified at Health and Safety Code Sections 42400.4, 42801, 42810, 42821, etc.<sup>2</sup>) as a nonprofit voluntary registry for GHG emissions. The purpose of CCAR is to help companies and organizations with operations in the state to establish GHG emissions baselines against which any future GHG emissions reduction requirements may be applied. CCAR has developed a general protocol and additional industry-specific protocols that provide guidance on how to inventory GHG emissions for participation in the registry. The California Climate Action Registry has now merged its GHG emissions registry with the climate registry and is primarily focused on offset projects and research.

### **Senate Bill 1078 and Governor's Order S-14-08 (California Renewable Portfolio Standards)**

Senate Bill 1078 (2002) (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. SB 107 (2006) changed the target date of this bill's implementation to 2010. This Senate Bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewable Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target.

For informational purposes, during 2007, Pacific Gas and Electric (PG&E), the electric utility that serves most of Placer County, including Rocklin, procured enough renewable energy to meet 13.1 percent of its electric supply.

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<sup>2</sup> Senate Bill 527 is codified at Health and Safety Code Sections 42400.4, 42801, 42810, 42821–42824, 42840–42843, 42860, 42870, 43021, 42410, 42801.1, 43023.

### **Senate Bill 375**

Senate Bill 375 (codified at Government Code and Public Resources Code<sup>3</sup>), signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years, but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

This bill also extends the minimum time period for the Regional Housing Needs Allocation (RNHA) cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the Regional Transportation Plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects." SB 375 applies to the Sacramento Area Council of Governments (SACOG), the MPO responsible for transportation planning in this region.

### **Executive Order S-13-08: The Climate Adaptation and Sea Level Rise Planning Directive**

On November 14, 2008, Governor Schwarzenegger issued Executive Order S-13-08 in order to reduce and assess California's vulnerability to climate change and sea level rise. The Executive Order initiated four major actions:

- Initiate California's first statewide climate change adaptation strategy that will assess the state's expected climate change impacts, identify where California is most vulnerable, and recommend climate adaptation policies.
- Request the National Academy of Science establish an expert panel to report on sea level rise impacts in California to inform state planning and development efforts.
- Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects.
- Initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise. This report was released in 2009 as the California Adaptation Strategy (CNRA 2009).

The Executive Order will provide consistency and clarify to state agencies on how to address sea level rise and other climate change related impacts in current planning efforts.

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<sup>3</sup> Senate Bill 375 is codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588, 14522.1, 14522.2, and 65080.01 as well as Public Resources Code Sections 21061.3, 21159.28, and Chapter 4.2.

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### **California Building Energy Efficiency Standards**

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, was established 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 efficiency technologies and methods. On January 12, 2010, the California Building Standards Commission adopted CALGreen and became the first state in the United States to adopt a statewide green building standards code. CALGreen will require new buildings to reduce water consumption by 20 percent, divert 50 percent of construction waste from landfills, and install low pollutant-emitting materials.

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### **Placer County Air Pollution Control District**

The project is under jurisdiction of the Placer County Air Pollution Control District (PCAPCD). The PCAPCD does not offer published guidance for addressing the GHG emissions associated with general plan updates and does not currently have an adopted threshold of significance for GHG emissions. There are no local regulations or law pertaining to climate change and greenhouse gas emissions. The PCAPCD does provide suggested mitigations for reducing GHG emissions in proposed projects and is moving toward a district-wide approach to addressing emissions.

### **Proposed City of Rocklin Climate Action Plan**

As a component of the City of Rocklin General Plan Update process, the City of Rocklin chose to develop a citywide GHG emissions inventory and Climate Action Plan (CAP). The City of Rocklin CAP augments the objectives, goals, policies, and actions of the City of Rocklin General Plan Update related to the reduction of GHG emissions. Specifically, through compliance with CEQA Guidelines Section 15183.5(b) and following industry standards, the CAP does the following:

- Identifies and quantifies major sources of GHG emissions from activities within the City of Rocklin municipal boundary, including municipal operations and citywide activities.
- Provides feasible strategies to reduce emissions from energy use, transportation, land use, and solid waste.
- Discusses the various outcomes of reduction efforts and how these reduction efforts can be implemented and advertised.
- Mitigates the impacts of the City of Rocklin on climate change (by reducing GHG emissions consistent with the direction of the State of California via AB 32 and Governor's Order S-03-05).
- Serves as a CEQA tiering document for projects proposed within the City of Rocklin for climate change, by which all applicable developments within the city will be reviewed.

The ultimate objective of the CAP is to reduce GHG emissions by 15 percent below 2008 levels by 2020 and 35 percent below 2008 levels by 2030. It is consistent with the State's goals related to climate change under Governor's Order S-03-05 and Assembly Bill 32, the Global Warming Solutions Act of 2006.

### **4.15.3 IMPACTS AND MITIGATION MEASURES**

#### **STANDARDS OF SIGNIFICANCE**

Per Appendix G of the CEQA Guidelines, impacts related to climate change are considered significant if implementation of the proposed project would result in any of the following:

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

To meet the GHG emission targets of AB 32, California would need to generate in the future less GHG emissions than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels or conflict with the goals of AB 32. Moreover, emitting CO<sub>2</sub> into the atmosphere is not itself an adverse environmental effect. It is the increased concentration of CO<sub>2</sub> in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of CO<sub>2</sub> into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of CO<sub>2</sub> emitted by the project would result in any altered conditions.

However, the State of California has established GHG reduction targets and has determined that GHG emissions as they relate to global climate change are a source of adverse environmental impacts in California that should be addressed under CEQA. Although AB 32 did not amend CEQA, it identifies the myriad environmental problems in California caused by global warming (Health and Safety Code, Section 38501[a]). In response to the relative lack of guidance on addressing GHGs and climate change, SB 97 was passed in order to amend CEQA by directing the Governor's Office of Planning and Research (OPR) to prepare revisions to the State CEQA Guidelines addressing the mitigation of GHGs or their consequences. These revisions to the State CEQA Guidelines went into affect in January 2010. In acknowledging that perhaps the most difficult part of the climate change analysis will be the determination of significance, AB 32 requires CARB, the State agency charged with regulating statewide air quality, to recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state. While CARB has published Recommended Approaches for Setting Interim Significance for Greenhouse Gases for project-level analysis, it has not yet completed this task for general plan projects at the time of this writing.

Under CEQA, an environmental impact report must identify and focus on the significant environmental effects of a project. Significant effect on the environment means a substantial, or potentially substantial, adverse change in the environment (Public Resources Code, Section 21068). CEQA further states that the CEQA Guidelines shall specify certain criteria to be used in determining whether projects would have a significant effect on the environment. However, as of the writing of this DEIR, the agencies with jurisdiction over air quality regulation and GHG emissions such as CARB and the Placer County Air Pollution Control District (PCAPCD) have not

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established a complete and adopted set of regulations, guidance, methodologies, significance thresholds, standards, or analysis protocols for the assessment of GHG emissions and climate change. A standardized, statewide methodology to establish an appropriate baseline, such as a project-level (regional GHG emissions) inventory, to evaluate the significance of GHG emission changes has not yet been established. This places the burden for establishing a methodology, and determining significance standards, on local lead agencies, such as the City of Rocklin.

The City is taking a proactive approach in addressing greenhouse gas (GHG) emission reductions by developing a Climate Action Plan (CAP) in concert with this General Plan Update. Addressing climate change in this manner defines Rocklin as an innovative member of the local government community. The General Plan goals, policies, and action steps reinforce the CAP. The CAP is intended to be updated on a more frequent basis than the General Plan, ensuring that implementation of City efforts to reduce GHG emissions is in compliance with current regulation. This approach is especially important given the constant flux of new research findings, technological improvements, and legislative updates dealing with climate change.

For the purposes of this DEIR, the City has decided to quantify total GHG emissions from the proposed General Plan Update by preparing a Climate Action Plan. The Climate Action Plan will determine whether implementation of the proposed General Plan Update would be consistent with the state's ability to attain the goals identified in AB 32 (i.e., reduction of statewide GHG emissions to 1990 levels by 2020) or as outlined in the AB 32 Scoping Plan, the functional equivalent of 15 percent below "current" (2005–2008) levels by 2020. In other words, the City of Rocklin will need to achieve a GHG emission reduction of 15 percent below current (2005–2008) levels under the General Plan Update in order to be consistent with AB 32 and reach a conclusion of a less than significant impact.

### **Methodology**

Transportation emissions from local roads and highways were calculated using the CARB Emissions Factor software, EMFAC2007, and the estimated traffic increases from the traffic study completed by DKS Engineering. PG&E provided the kilowatt-hours (kWh) of electricity and therms of natural gas consumed in Rocklin in 2008. These figures were multiplied by PG&E emissions coefficients that were verified by the California Public Utilities Commission (CPUC). Waste emissions were calculated using the EPA's Waste Reduction Model (WARM). WARM calculates and totals GHG emissions of baseline and alternative waste management practices — source reduction, recycling, combustion, composting, and landfilling. The model calculates emissions in metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e) across a wide range of material types commonly found in municipal solid waste (MSW) (EPA 2009). The California Integrated Waste Management Board (CIWMB; now CalRecycle) 2004 Waste Characterization Study provided the percentages of waste by type (paper, glass, compostables, etc.) for use in the WARM model.

It is important to note that all CO<sub>2</sub> emissions from General Plan Update implementation may not necessarily be considered "new" emissions given that the General Plan itself does not create new emitters (people) of GHGs. In other words, the GHG emissions resulting from new development are not necessarily all new GHG emissions, but the relocation of GHG emissions from one location to another. Emissions of GHGs are, however, influenced by the location and design of projects, to the extent that they can influence travel to and from the projects, and to the degree the projects are designed to maximize energy efficiency. For this reason and others,

this DEIR calculates emissions in terms of carbon dioxide equivalent (CO<sub>2</sub>e) per service population.<sup>4</sup>

The methodology used in this DEIR to analyze the implementation of the proposed General Plan Update's potential effect on global warming includes a calculation of GHG emissions. Absent an adopted regulatory threshold or other regulatory guidance, the City has determined that the proposed project's potential for creating an impact on global climate change should be based on a comparative analysis of the General Plan Update against AB 32 targets in the year 2020 and progress toward Executive Order S-3-05 targets in the year 2030. In order for California to meet the goals of AB 32 and Executive Order S-3-05, emissions will need to be reduced by 15 percent below current (2005–2008) levels by 2020 and 42 percent by 2030. The City of Rocklin would also need to achieve the same GHG targets in order to be consistent with AB 32.

### **Consistency with Greenhouse Gas Reduction Measures**

- Impact 4.15.1** Implementation of the proposed General Plan Update and the Climate Action Plan would implement a number of policies and activities as well as continue the implementation of existing City programs that would complement and be consistent with the early emission reduction strategies contained in the AB 32 Scoping Plan Report to the Governor and Executive Order S-3-05 as well as the recommendations from OPR. Therefore, a conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases is not anticipated. This impact is considered to be **less than cumulatively considerable**.

**Table 4.15-2** identifies major GHG emissions per service population under a business-as-usual (BAU) scenario (General Plan Update without CAP implementation). **Table 4.15-2** includes GHG emissions per service population for the years 2008 (current levels), 2020, and 2030. It should be noted that these are emissions from major sources and do not factor into smaller GHG emission sources (e.g., miscellaneous maintenance operations in the city such as landscape maintenance and construction activities) as well as GHG reduction measures currently and planned to be employed by the City.

GHG emissions generated by subsequent development under the proposed General Plan Update would predominantly consist of CO<sub>2</sub>. In comparison to criteria air pollutants, such as ozone and PM<sub>10</sub> (particulate matter 10 microns or less), CO<sub>2</sub> emissions persist in the atmosphere for a substantially longer period of time. While emissions of other greenhouse gases, such as methane, are important with respect to global climate change, emission levels of other GHGs are less dependent on the land use and circulation patterns associated with the proposed land use development project than are levels of CO<sub>2</sub>.

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<sup>4</sup> Service population is an efficiency-based measure used to estimate the development potential of a general or area plan. Service population is determined by adding the number of residents to the number of jobs estimated for a given point in time.

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**TABLE 4.15-2**  
**PROPOSED GENERAL PLAN UPDATE GREENHOUSE GAS EMISSIONS IN**  
**CARBON DIOXIDE EQUIVALENT (CO<sub>2</sub>E) (BUSINESS AS USUAL)**

General Plan Update without Climate Action Plan (Business As Usual)		
Sector	Metric Tons CO <sub>2</sub> e	CO <sub>2</sub> e/Service Population
<b>Year 2008 (Current Levels)</b>		
Energy	192,188	2.81
Transportation	234,207	3.42
Waste	1,605	0.02
<b>Total</b>	<b>428,000</b>	<b>6.26</b>
<b>Year 2020</b>		
Energy	255,439	2.71
Transportation	393,971	4.18
Waste	2,188	0.02
<b>Total</b>	<b>651,598</b>	<b>6.92</b>
<b>Year 2030</b>		
Energy	305,046	2.93
Transportation	561,863	5.41
Waste	2,270	0.02
<b>Total</b>	<b>869,179</b>	<b>8.37</b>

As shown in **Table 4.15-2**, the transportation sector is the single largest source of projected GHG emissions in the city.

The City of Rocklin is committed to reducing GHG emissions and has developed strategies to meet its reduction targets. The City has set emission reduction targets for 2020 and 2030 that would result in a significant reduction from business-as-usual (unmitigated) General Plan Update emissions growth, consistent with the direction of AB 32 and Executive Order S-03-05. The strategies identified in the City's CAP combined with emissions reductions from state programs would achieve a CO<sub>2</sub>e per service population reduction of 33.4 percent by 2020 and a 51.3 percent reduction in CO<sub>2</sub>e by 2030 compared with business as usual, as shown in **Table 4.15-3**.

CEQA Guidelines Section 15183.5 describes the necessary elements of a greenhouse gas emissions reduction strategy for a local jurisdiction. The discussion below outlines how the City complies with each of the individual criteria listed in the guidelines through the City's Climate Action Plan reduction strategies.

- The City of Rocklin has quantified existing and proposed greenhouse gas emissions throughout the community, including regional and state programs as appropriate. These quantifications used standard industry methodologies, where available, to support the conclusion in this plan that the City of Rocklin can meet its proposed reduction targets.

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- The City of Rocklin has adopted targets for emissions reductions as a part of its Climate Action Plan, consistent with the direction provided by the AB 32 Scoping Plan and Executive Order S-03-05. The Climate Action Plan will be evaluated on a regular basis to ensure target compliance is proceeding at a pace necessary to meet the targets of 2020 and 2030.
- The Climate Action Plan thoroughly analyzes emissions from the City of Rocklin's community operations, consistent with standard industry protocol at the time of its development.
- Measures proposed in the Climate Action Plan include those that are anticipated to significantly reduce emissions from the community. All measures were quantified using standard industry practice at the time of Climate Action Plan development, where available, to ensure that the stated reductions are supported by substantial evidence. Minor emissions reduction measures, including the City operational measures that do not significantly reduce greenhouse gas emissions, were not included. Reduction measures come from five primary sources:
  1. City of Rocklin General Plan policies
  2. City of Rocklin Climate Action Plan reduction measures
  3. City of Rocklin programs and actions currently being implemented
  4. Regional programs and policies in which the City participates
  5. Applicable California State policies and programs
- The City of Rocklin has developed a Microsoft Excel-based monitoring and implementation tool to allow the City to track emissions over time and modify or replace emissions reduction measures that are not performing as anticipated.
- The greenhouse gas reduction strategies that are a part of the Climate Action Plan were developed in coordination with the City's General Plan Update efforts and General Plan Update Environmental Impact Report (EIR) and are fully included in the analysis associated with the City's General Plan EIR.

Through completion of the above criteria, the City has demonstrated that the greenhouse gas reduction strategies within its Climate Action Plan are consistent with the guidance set forth by CEQA Guidelines Section 15183.5.

**Table 4.15-3** depicts the emission reductions in 2020 and 2030 with implementation of the CAP.

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**TABLE 4.15-3**  
**GREENHOUSE GAS EMISSIONS REDUCTIONS PER SERVICE POPULATION**  
**UNDER CLIMATE ACTION PLAN IN 2020 AND 2030**

	Emissions Reduction 2020		Emissions Reduction 2030	
	Metric Tons (CO <sub>2</sub> e)	Service Population	Metric Tons (CO <sub>2</sub> e)	Service Population
<b>CAP Measures</b>				
Energy Efficiency and Conservation	-19,968	- 0.22	-38,992	-0.38
Renewable Energy	-1,246	-0.02	-4,636	-0.05
Green Building and Design	-12,106	-0.12	-36,227	-0.34
Downtown Rocklin	-332	-0.00	-759	-0.00
Citywide Land Use	-29,716	-0.31	-53,592	-0.51
Alternative Transportation Modes	-39,204	-0.41	-102,491	-0.99
Vehicle Efficiency and Alternative Fuels	-1,889	-0.03	-3,405	-0.04
Waste Reduction	-936	-0.01	-971	-0.01
<b>Total CAP Measure Reductions</b>	<b>-105,397</b>	<b>-1.12</b>	<b>-241,073</b>	<b>-2.32</b>
<b>State Measures</b>				
Renewable Portfolio Standard	-42,161	-0.44	-94,872	-0.91
Pavley (AB 1493)	-63,339	-0.67	-91,133	-0.87
Low Carbon Fuel Standard	-5,700	-0.06	-18,226	-0.17
<b>Total State Measure Reductions</b>	<b>-111,201</b>	<b>-1.18</b>	<b>-204,232</b>	<b>-1.96</b>
<b>Total Reduction (CAP and State Measures)</b>	<b>-216,597</b>	<b>-2.30</b>	<b>-445,304</b>	<b>-4.29</b>
Projected Emissions Levels under General Plan (BAU)	651,598	6.92	869,178	8.37
<b>Net Emissions (projected reductions)</b>	<b>435,000</b>	<b>4.62</b>	<b>423,873</b>	<b>4.08</b>
<b>Percentage Reduction</b>	<b>33.2%</b>		<b>51.2%</b>	

As shown in **Table 4.15-3**, the City of Rocklin would achieve (and exceed) the GHG targets of 15 percent below current (2005–2008) per service population levels by 2020 and 42 percent by 2030 and is therefore consistent with AB 32.

In addition, the following citywide programs and policies contribute to the reduction of GHG emissions:

- Participation in Pacific Gas and Electric's (PG&E) Climate Smart Program – The City agreed to a fixed increase to its monthly PG&E bill to offset the carbon emissions caused by energy used in City facilities.
- The City passed a resolution supporting the Partnership for Prosperity Clean Technology Initiative to attract clean technology companies.

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- The City is a member of the U.S. Green Building Council, a nonprofit organization dedicated to sustainable building design and construction.
- The City is working toward Leadership in Energy and Environmental Design (LEED) certification on its Administration and Police Station buildings, with efforts including changes in cleaning practices, cleaning materials and supplies, energy efficiency, and indoor environmental quality.
- The City is a member of Build-It-Green, a nonprofit organization focused on providing education and information to individuals and developers of residential projects on ways they can utilize green technology and products to reduce energy usage, save resources, and build a healthier indoor environment.
- Training for the City's building inspections and development staff on green building project certifications and the requirements on how to build green.
- The City is participating in implementing a universal residential solar program with neighboring jurisdictions to address residential solar programs, develop a standardized fee, and create consistent information resources on green building practices for use on websites. The City will also be hosting a workshop for permit technicians to educate on green building practices and programs and to provide training.
- The City constructed solar carports at its police station facility, which generate nearly 40 percent of the annual electricity required to operate the facility.
- The City hosted a free, two-hour "Solar Saturday" workshop to provide information and education to residents on residential solar technology and hosted a similar workshop for developers.
- In 1998, the City's Public Works Department initiated a project to replace traffic signal lights (incandescent bulbs) with light-emitting diodes (LEDs). This project was completed in 2001, and all new traffic signal lights come standard with LED bulbs.
- In 1998, the City Council approved a plan to reduce water use in city street landscaping by removing turf and replacing it with drought-tolerant plants. The Public Works Department is continuing its program to reduce water use through turf removal/plant replacement and requiring developers to plant drought-tolerant plants and install drip irrigation along streetscapes in new projects.
- The City requires development projects' landscape plans to include an automatic irrigation system, and the use of drip irrigation is encouraged. Project landscape plans are also required to be certified by the landscape architect as meeting the requirements of the Water Conservation in Landscaping Act (Government Code Section 68591 et seq.).
- The City utilizes untreated water for irrigation purposes in some locations.
- The City created a centrally located park-and-ride lot that is separate and apart from the Caltrans park-and-ride facility program.
- The City has adopted a Neighborhood Electric Vehicle (NEV) Transportation Master Plan that identifies roadways that will accommodate NEVs.

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- The City's Fleet Division is taking steps to reduce the City's carbon footprint by installing diesel oxidation catalysts on its diesel-powered vehicles and equipment. The Fleet Division is also purchasing alternative fueled vehicles that will use E85, has implemented procedures to reduce engine idling time, and is considering the introduction of hybrid vehicles into the fleet.
- The City is an active partner in the Placer County Materials Recovery Facility (MRF) that supports recycling of household and business waste. The MRF diverts over 50 percent of the solid waste generated within the city from landfill disposal, consistent with the requirements of AB 939.
- The City has adopted an Urban Forest Management Plan with specific strategies for expanding tree canopy within the city. The plan has shown that development in the city that is consistent with the City's General Plan policies and tree replacement mitigation requirements has resulted in an increase of tree canopy cover from 11 percent in 1952 to 18 percent in 2003 (a 63 percent increase). The plan provides a framework for the City to maintain its existing tree canopy cover and to increase it to a greater extent as development continues.
- Through the development planning process, the City has set aside a significant portion (approximately 19.4 percent) of city land area as open space and parkland. As a part of this effort, the City purchased significantly sized properties that were designated for development and reclassified them as parks and open space.
- In 1998, the City instituted a voluntary holiday furlough program that allows City employees (except essential service personnel) to have the opportunity to take time off between the Christmas and New Year's Day holidays. More than 90 percent of City staff takes advantage of this opportunity, allowing for energy savings by not having to power City facilities.
- The City is working with the California Energy Commission in the Motherlode Program, which allows for replacement of HVAC and lighting equipment that are not energy efficient.
- The City is incorporating increased indirect lighting into new facility construction projects and encourages employees to reduce energy usage in facilities.
- The City's facility maintenance operations use recycled paper products in restrooms and maintenance activities throughout City facilities. In addition, products used for cleaning facilities are "green-seal certified," meaning that they are environmentally friendly.
- Some City facilities are utilizing an HVAC energy efficiency management system.
- Some City facilities utilize sensor-activated faucets, toilets, and paper towel dispensers.
- The City will be implementing preferred parking for carpoolers and alternative fuel vehicles at its Administration building.
- The City has an Oak Tree Preservation and Mitigation Ordinance.
- The City has a parking lot shade tree requirement as part of its Zoning Ordinance.

- The City requires electric vehicle recharging stations on appropriate development projects.
- The City has conducted native oak tree reforestation and restoration projects in city parks, open space, and along creek channels.
- The City will be implementing an environmental purchasing plan with the objectives of instituting practices that reduce waste by increasing product efficiency and effectiveness, purchasing products that minimize environmental impacts, toxics, pollution, and hazards to worker and community safety to the greatest extent practical, and, when practical, purchasing products that include recycled content, are durable and long-lasting, conserve energy and water, use agricultural fibers and residues, reduce greenhouse gas emissions, use unbleached or chlorine free manufacturing processes, are lead-free and mercury-free, and use wood from sustainable harvested forests.

### **Proposed General Plan Update Policies That Provide Mitigation**

The following proposed General Plan policies would reduce the proposed project's contribution to cumulative impacts associated with greenhouse gas emissions:

- Policy LU-3      Apply a mixed-use (residential/commercial or office) land use category or overlay within the Downtown Rocklin Plan area and other appropriate locations in the City of Rocklin.*
- Policy LU-11     Encourage infill residential development that is in keeping with the character and scale of the surrounding neighborhood, while providing a variety of densities and housing types as reflected by the zoning and land use designation of the infill property.*
- Policy LU-13     Review proposals for new residential development for compatibility with the character and scale of nearby neighborhoods, while providing a variety of densities and housing types as reflected by the zoning and land use designation of the infill property.*
- Policy LU-25     Encourage mixed use developments to locate near major arterial and/or collector streets.*
- Policy LU-31     Promote and renew as needed, the Pacific Street, Rocklin Road, Sunset Boulevard, Granite Drive, Lone Tree, Blue Oaks and the Highway 65 corridor business districts in order to provide diversified business opportunities and greater pedestrian orientation.*
- Policy LU-39     Implement the Downtown Rocklin Plan to address land use mix, design features, parking, pedestrian movement, traffic and circulation, and promotion opportunities to provide a clear and strong economic identity to the core downtown area.*
- Policy LU-43     Attract job generating land uses that will provide a variety of employment opportunities for those who live, or are likely to live, in the community or South Placer subregion.*

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- Policy LU-56 Encourage pedestrian oriented plazas, walkways, bike trails, bike lanes and street furniture within the Civic Center area and connections to other community areas.*
- Policy C-2 Coordinate land use and transportation planning to support transit services, NEV facilities and non-motorized transportation.*
- Policy C-3 Promote the use of Neighborhood Electric Vehicles (NEV) by providing accommodations (i.e., lane striping and signage) to facilitate the use of these vehicles where feasible within existing and planned rights-of-way.*
- Policy C-4 Promote the use of non-motorized transportation by providing a system of bicycle routes and pedestrian ways.*
- Policy C-5 Coordinate with public transit providers to meet residents' needs.*
- Policy C-6 Encourage non-residential development proposals to incorporate features that promote ridesharing or use of alternative transportation modes.*
- Policy C-50 Work with transit providers to plan, fund and implement additional transit services that are cost-effective and responsive to existing and future transit demand.*
- Policy C-51 Promote the use of public transit through development conditions such as requiring park-and-ride lots, bus turnouts and passenger shelters along major streets.*
- Policy C-53 Support the expansion of intercity rail passenger services, such as the Capitol Corridor, and implementation of regional rail passenger services.*
- Policy C-54 Support the study of developing rail passenger services within the Highway 65 corridor.*
- Policy C-55 Require Class II bike lanes in the design and construction of major new streets and to establish bike lanes on those City streets wide enough to accommodate bicycles safely.*
- Policy C-56 Improve bicyclist and pedestrian safety through such methods as signage, lighting, traffic controls, and crosswalks.*
- Policy C-57 Maintain the Rocklin Bikeway Diagram and update it as necessary with the approval of major new developments and/or general plan amendments not considered in the adopted Diagram.*
- Policy C-58 Consult with adjacent jurisdictions regarding the development of regional bikeway and NEV links.*
- Policy C-59 Promote pedestrian convenience and recreational opportunities through development conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses including residential areas, commercial areas, schools, parks, employment centers and open space.*

*Policy C-60 Consider NEV routes in the design and construction of major new streets and consider the establishment of NEV routes on existing City streets wide enough to accommodate NEV lanes.*

As identified above, implementation of the proposed General Plan Update and Climate Action Plan would be consistent with state measures to reduce greenhouse gas emissions. The City's General Plan Update will be consistent with AB 32, and this impact is **less than cumulatively considerable**.

As part of the proposed project, the City plans to amend the Redevelopment Plan to increase tax increment limitations, increase the limit on the principal amount of bonded indebtedness secured by tax increment revenue, and extend the time limit for the commencement of eminent domain proceedings to acquire non-residential property. These amendments are intended to provide the City's Redevelopment Agency with the financial and administrative resources necessary to continue assisting projects that implement its program of blight elimination within the Redevelopment Project Area. While the extended time and financial limits authorized by the Sixth Amendment may foster and encourage new development that might not occur without the Sixth Amendment, or may occur faster than had the Sixth Amendment not been adopted, all development would be consistent with the City's General Plan and with the development assumptions analyzed throughout this DEIR. Any future development resulting from amending the Redevelopment Plan would occur in areas designated for such development by the General Plan as the land uses permitted by the Redevelopment Plan are the allowable uses under the City's General Plan. Therefore, the proposed Sixth Amendment to the Redevelopment Plan would not result in the generation of greenhouse gas emissions beyond what is analyzed for the General Plan Update above. Impacts would be **less than cumulatively considerable**.

### **Mitigation Measures**

None required.

### **Climate Change Environmental Effects on the City**

**Impact 4.15.2** Future development under the proposed General Plan Update could be exposed to environmental effects associated with climate change. This impact is considered to be **less than cumulatively considerable**.

As identified above, there are several technical studies regarding the environmental effects of climate change on the earth as well as California. Several adverse environmental effects have been identified that are projected to impact California over the next century. However, the extents of these environmental effects are still being defined as climate modeling tools become more refined. Potential environmental effects of climate change that could impact Rocklin could include the following:

- Adverse impacts on water supply availability
- Increased severity of flooding events
- Increased wildland fire hazards
- Alteration of natural habitats for special-status plant and animal species
- Air quality impacts

Because considerable uncertainty remains with respect to the extent and severity of overall impact of global climate change on California and the city, it is unknown whether these impacts would be significant specifically to Rocklin. This also includes the uncertainty as to what degree

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global climate change may adversely impact future Placer County water supply and availability. However, based on consideration of the recent regional and local climate change studies, and based on the knowledge that the Placer County Water Agency's surface source is anticipated to largely remain intact (though the form of precipitation is expected to come more from rain rather than snow), it is reasonably expected that the impacts of global climate change on the city would be **less than cumulatively considerable**.

### Mitigation Measures

None required.

### **Generation of Greenhouse Gas Emissions**

**Impact 4.15.3** Implementation of the proposed General Plan Update and the associated future development would generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. This impact is considered to be a **cumulatively considerable** impact.

As discussed above in Impact 4.15.1, subsequent development under the proposed General Plan Update would generate GHG emissions that would predominantly consist of CO<sub>2</sub>. While emissions of other GHGs, such as methane, are important with respect to global climate change, emission levels of other GHGs are less dependent on the land use and circulation patterns associated with the proposed General Plan Update than are levels of CO<sub>2</sub>. The City has been proactively undertaking current efforts and is also proposing a Climate Action Plan (CAP) and General Plan Update policies to be consistent with the early emission reduction strategies contained in the AB 32 Scoping Plan Report to the Governor and Executive Order S-3-05 as well as recommendations from OPR. While it is acknowledged in Impact 4.15.1 that the City of Rocklin is committed to reducing GHG emissions and has developed strategies to meet its reduction targets so that implementation of the proposed General Plan Update and Climate Action Plan would be consistent with state measures to reduce GHG emissions, it must also be acknowledged that continued development under the proposed General Plan Update will still generate GHG emissions. Therefore, buildup of the proposed General Plan Update would result in the generation of GHG emissions which are **cumulatively considerable** and **significant and unavoidable**.

In addition, as discussed in Section 3.0, Project Description, and under Impact 4.15.1 above, the project includes the Sixth Amendment to the Redevelopment Plan and the CAP, both of which would be consistent with the proposed General Plan Update and with the development assumptions analyzed throughout this DEIR. As these project components would not result in land use activities or population growth beyond what is identified in the General Plan Update, they would not result in impacts associated with the generation of greenhouse gas emissions beyond what is analyzed for the General Plan Update above.

### Mitigation Measures

None available to offset increases in emissions.

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