

## 4.7 GREENHOUSE GAS EMISSIONS

This section assesses the greenhouse gas (GHG) emissions that would be generated by implementation of the Draft General Plan. GHG emissions have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change. This section also provides a background discussion of climate change, a discussion of existing sources of GHG emissions, and a summary of applicable regulations.

### 4.7.1 REGULATORY SETTING

#### FEDERAL

#### U.S. Environmental Protection Agency “Endangerment” and “Cause or Contribute” Findings

The U.S. Supreme Court held that the U.S. Environmental Protection Agency (EPA) must consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency* (2007) 549 US 497, 12 states (including California) and cities along with several environmental organizations sued to require EPA to regulate GHGs as pollutants under the Clean Air Act (CAA) (127 S. Ct. 1438 [2007]). The Supreme Court ruled that GHGs fit within the CAA’s definition of a pollutant and that EPA had the authority to regulate GHGs. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- ▶ *Endangerment Finding:* The current and projected concentrations of the six key GHGs—CO<sub>2</sub>, methane, nitrous oxide, HFCs, PFCs, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.
- ▶ *Cause or Contribute Finding:* The combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

#### Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year 2008 Consolidated Appropriations Act (House of Representatives Bill 2764; Public Law 110-161), which required EPA to develop “...mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy...” The Reporting Rule applies to most entities that emit 25,000 metric tons of CO<sub>2</sub>e or more per year. Since 2010, facility owners have been required to submit an annual GHG emissions report with detailed calculations of the facility’s GHG emissions. The Reporting Rule also mandates compliance with recordkeeping and administrative requirements to enable EPA to verify annual GHG emissions reports.

#### EPA and NHTSA Motor Vehicle Standards

On May 7, 2010, EPA published the Final Rule for Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards was published in the Federal Register (75 Federal Register 25323–25728). EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable automakers to produce a new generation of vehicles that emit fewer GHGs and offer improved fuel efficiency. The final combined EPA/NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. EPA and NHTSA issued a second joint rulemaking on September 15, 2011 that established a comprehensive Heavy-Duty National Program to reduce GHG emissions and fuel consumption for model year 2014 to 2018 on-road heavy-duty vehicles. On August 28, 2012, EPA and NHTSA issued a final rulemaking for fuel-economy and GHG standards for model year 2017 through 2025 passenger vehicles and light-duty trucks.

## STATE

The legal framework for GHG emission reductions has come about through governors' executive orders, legislation, and regulation. The major components of California's climate change policy are reviewed below.

### **Assembly Bill 1493**

Assembly Bill (AB) 1493 requires ARB to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with model year 2009. In June 2009, the EPA Administrator granted a CAA waiver of preemption to California. This waiver allowed California to implement its own GHG emissions standards for motor vehicles beginning with model year 2009. California agencies worked with federal agencies to conduct joint rulemaking to reduce GHG emissions for passenger car model years 2017 to 2025.

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

Executive Order S-3-05, issued in recognition of California's vulnerability to the effects of climate change, set forth the following target dates by which statewide GHG emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80% below 1990 levels.

### **Assembly Bill 32**

In 2006, the California Legislature passed AB 32 (California Health and Safety Code Section 38500 et seq.), also known as the Global Warming Solutions Act. AB 32 requires ARB to design and implement feasible and cost-effective emissions limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020. AB 32 anticipates that the GHG reduction goals will be met, in part, through local government actions.

Pursuant to AB 32, ARB adopted the *Climate Change Scoping Plan* (Scoping Plan) in December 2008, outlining measures to meet the 2020 GHG reduction goals. ARB is required to update the Scoping Plan at least once every 5 years to evaluate progress and develop future inventories that may guide this process. ARB released *First Update to the Climate Change Scoping Plan: Building on the Framework* in May 2014 (ARB 2014). The Scoping Plan update includes a status of the 2008 Scoping Plan measures and other state, federal, and local efforts to reduce GHG emissions in California and potential actions to further reduce GHG emissions by 2020. The update also provides discussions of sector-specific (e.g., transportation) issues, technologies, needs, and ongoing State activities to significantly reduce emissions through 2050.

The Scoping Plan recommended the development of a Cap and Trade Program that links with other programs to create a regional market system. On January 1, 2013, ARB launched the GHG Cap-and-Trade Program to ensure progress toward the near-term 2020 statewide GHG limit, while giving companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. The Cap-and-Trade Program establishes a hard and declining cap on approximately 85 percent of total statewide GHG emissions.

The initial Scoping Plan also identified a GHG reduction target of 15% from current levels (i.e., year 2005 levels) for local governments (municipal and communitywide) to coincide with the statewide limit. Local government climate action planning should also adopt mid-term and long-term reduction targets that are consistent with the trajectory to meet the statewide goal of reducing emissions 80 percent below 1990 levels by 2050.

## **Climate Adaptation Strategy**

Executive Order S-13-08 was issued on November 14, 2008 to enhance the State's management of potential climate effects from sea level rise, increased temperatures, shifting precipitation and extreme weather events. The Executive Order included four key 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 by early 2009;
- ▶ Request the National Academy of Science to 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; and
- ▶ Initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise.

The California Natural Resources Agency was directed to coordinate with local, regional, state, and federal public and private entities to develop the California Climate Adaptation Strategy, which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency (CNRA 2009). Numerous state agencies were involved in the creation of the California Climate Adaptation Strategy document, including Environmental Protection; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. In 2014, the California Natural Resources Agency issued an update to the 2009 Climate Action Strategy ("Safeguarding California: Reducing Climate Risk").

## **Executive Order S-1-07**

Executive Order S-1-07 acknowledges that the transportation sector is the main source of GHG emissions in California. The order established a goal of reducing the carbon intensity of transportation fuels sold in California by a minimum of 10% by 2020. It also directed ARB to determine whether this Low Carbon Fuel Standard could be adopted as a discrete, early-action measure after meeting the mandates in AB 32. ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

## **Senate Bill 97**

SB 97, enacted in August 2007, recognizes climate change as a prominent environmental issue that requires analysis under CEQA. On December 30, 2009, the Natural Resources Agency adopted amendments to the State CEQA Guidelines, as required by SB 97. These State CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments became effective March 18, 2010.

## **Senate Bills 1078 and 107 and Executive Orders S-14-08 and S-21-09**

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20% of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

Executive Order S-14-08 expanded the state's Renewable Portfolio Standard to 33% renewable power by 2020. Executive Order S-21-09 directs ARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33% renewable energy by 2020.

The 33%-by-2020 goal was codified in April 2011 with SB X1-2. This new Renewable Portfolio Standard applies to all electricity retailers in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Consequently, Pacific Gas and Electric (PG&E), which would be the electricity provider for Amador County, must meet the 33% goal by 2020. All of these entities must adopt the new Renewable Portfolio Standard goals of 20% of retail sales from renewables by the end of 2013 and 25% by the end of 2016.

### **Senate Bill 375**

In addition to policy directly guided by AB 32, the Legislature in 2008 passed SB 375, which provides for regional coordination in land use and transportation planning and funding to help meet the AB 32 GHG reduction goals. SB 375 aligns regional transportation planning efforts, regional GHG emissions reduction targets, and land use and housing allocations. SB 375 requires regional transportation plans (RTPs) developed by the state's 18 metropolitan planning organizations (MPOs) to incorporate a "sustainable communities strategy" that will achieve GHG emission reduction targets set by ARB. SB 375 also includes provisions for streamlined CEQA review for some infill projects. Amador County is not included in an MPO for which an SB 375-compliant RTP is required.

### **Green Building Standards Code**

In January 2010, the State of California adopted the California Green Building Standards Code, which establishes mandatory green building standards for all buildings in California. The code covers five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and indoor environmental quality. These standards include a mandatory set of minimum guidelines, as well as more rigorous voluntary measures, for new construction projects to achieve specific green building performance levels. This code went into effect as part of local jurisdictions' building codes on January 1, 2011. The 2013 update to the code has been adopted by the State of California and became effective January 2014. (Title 24 CCR Part 11.)

## **4.7.2 ENVIRONMENTAL SETTING**

### **EXISTING CLIMATE**

The term "climate" refers to the accumulation of daily and seasonal weather events over a long period of time, whereas "weather" is defined as the condition of the atmosphere at any particular time and place (Ahrens 2003:16). See Section 4.3, "Air Quality," for a description of the meteorology and climate of Amador County and the Mountain Counties Air Basin (MCAB).

### **SCIENTIFIC BASIS OF CLIMATE CHANGE**

GHGs play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters the earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This infrared radiation (i.e., thermal heat) is absorbed by GHGs within the earth's atmosphere. As a result, infrared radiation released from the earth 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 the earth.

GHGs are present in the atmosphere naturally, are released by natural and anthropogenic (human-caused) sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals and plants; decomposition of organic matter; and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels, waste treatment, and agricultural processes. The following GHGs are widely accepted as the principal contributors to human-induced global climate change:

- ▶ carbon dioxide (CO<sub>2</sub>),
- ▶ methane,
- ▶ nitrous oxide,
- ▶ hydrofluorocarbons (HFCs),
- ▶ perfluorocarbons (PFCs),
- ▶ sulfur hexafluoride, and
- ▶ nitrogen trifluoride.<sup>1</sup>

Natural sources of CO<sub>2</sub> include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; and evaporation from oceans. Anthropogenic sources include burning of coal, oil, natural gas, and wood. Methane is the main component of natural gas and is associated with agricultural practices and landfills. Nitrous oxide is a colorless GHG that results from industrial processes, vehicle emissions, and agricultural practices. HFCs are synthetic chemicals used as a substitute for chlorofluorocarbons in automobile air conditioners and refrigerants. PFCs are produced as a byproduct of various industrial processes associated with aluminum production and the manufacturing of semiconductors. Sulfur hexafluoride is an inorganic, odorless, colorless, nontoxic, nonflammable GHG used for insulation in electric power transmission and distribution equipment and in semiconductor manufacturing. Nitrogen trifluoride is used in the electronics industry during the manufacturing of consumer items, including photovoltaic solar panels and liquid-crystal-display (i.e., LCD) television screens.

Global warming potential (GWP) is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to CO<sub>2</sub>. The GWP of a GHG is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the gas's "atmospheric lifetime" (the length of time that the gas remains in the atmosphere). The reference gas for GWP is CO<sub>2</sub>, which has a GWP of 1. The GWPs of other GHG pollutants are then determined relative to CO<sub>2</sub>. For example, the other main GHGs that have been attributed to human activity include methane, which has a GWP of 21, and nitrous oxide, which has a GWP of 310 (IPCC 2013). Thus, 1 ton of methane has the same contribution to the greenhouse effect as approximately 21 tons of CO<sub>2</sub>. GHGs with lower emission rates than CO<sub>2</sub> may still contribute to climate change because they are more effective at absorbing outgoing infrared radiation than CO<sub>2</sub> (i.e., they have a high GWP). The concept of CO<sub>2</sub> equivalents (CO<sub>2</sub>e) is used to account for the different GWP potentials of GHGs to absorb infrared radiation.

GHG emissions related to human activities have been determined to be highly likely responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (IPCC 2013). Similarly, impacts of GHGs are borne globally, as opposed to the more localized air quality effects of criteria air pollutants and toxic air contaminants. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, no single project alone is expected to measurably contribute to a noticeable incremental change in the global average temperature or to a global climate, local climate, or microclimate.

## TRENDS OF CLIMATE CHANGE

Warming of the climate system is now considered to be unequivocal, with global surface temperature increasing by approximately 1.33 degree Fahrenheit (°F) over the last 100 years (IPCC 2013). The rate of increase in global average surface temperature over the last 100 years has not been consistent; warming has occurred at a much faster rate during the last three decades—on average, 0.32°F per decade. Continued warming is projected to increase the global average temperature over the next 100 years by an average of 2°F to 11°F (IPCC 2013).

The causes of this warming have been identified as both natural processes and human actions. The Intergovernmental Panel on Climate Change concluded that variations in natural phenomena, such as solar radiation and volcanoes, produced most of the warming from preindustrial times to 1950 and had a small cooling effect afterward. However, since 1950, increasing GHG concentrations resulting from human activity, such as

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<sup>1</sup> Nitrogen trifluoride is recognized by the State of California as a GHG (California Health and Safety Code, Section 38505[g]).

fossil fuel burning and deforestation, have been determined with 95% certainty to be responsible for most of the observed temperature increase (IPCC 2013).

## IMPACTS OF CLIMATE CHANGE

During the same period when increased global warming has occurred, many other changes have occurred in other natural systems. Sea levels have risen; precipitation patterns throughout the world have shifted, with some areas becoming wetter and others drier; snowlines can rise, resulting in changes to the snowpack, runoff, and water storage; and numerous other conditions have been observed. Although it is difficult to prove a definitive cause-and-effect relationship between global warming and other observed changes to natural systems, there is a high level of confidence in the scientific community that these changes are a direct result of increased global temperatures caused by the increased presence of GHGs in the atmosphere (IPCC 2013).

Additional changes related to climate change can be expected by the year 2050 and on to the end of the century:

- ▶ California's mean temperature may rise 2.7°F by 2050 and 4.1°F to 8.6°F by the end of the century (CEC 2012). Temperatures in Amador County may rise 3.7°F to 6.4°F during that same period (CEC 2014).
- ▶ Sea level rise is expected to continue, and the most recent climate science report, *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*, has estimated that sea levels along the US Pacific Coast would increase up to 66 inches by 2100 (NRC, 2012). No areas in Amador County would be subject to flooding as a result of climate change-related sea level rise.
- ▶ Various California climate models provide mixed results regarding forecasted changes in total annual precipitation in the state through the end of this century. However, recent projections suggest that 30-year statewide average precipitation will decline by more than 10 percent (CEC 2012). Although most of the changes in precipitation are projected to occur in Central and Southern California, Amador County can expect to be drier from the warming effects as the spring snowpack will melt sooner, and the moisture contained in soils will evaporate during long dry summer months (CEC 2012).
- ▶ Wildfire risk in California will increase as a result of climate change. Projections for Amador County indicate that the total area affected by wildfires could increase by 1.79 to 2.98 times by 2085 compared to existing conditions (CEC 2014).

## GREENHOUSE GAS EMISSION SOURCES

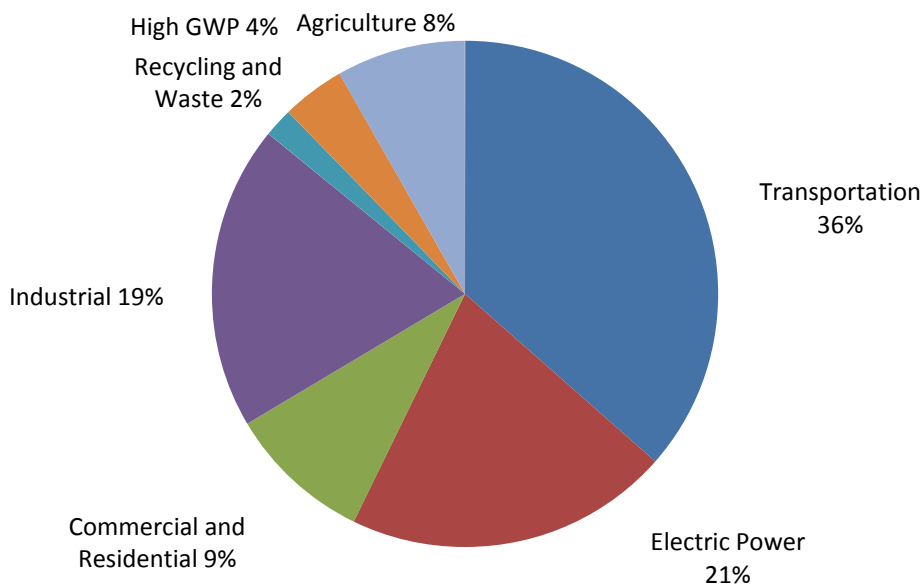
GHG emissions contributing to global climate change are attributable in large part to human activities. To account for and regulate GHG emissions, sources of GHG emissions are grouped into emission categories. The California Air Resources Board (ARB) identifies the following categories, which account for most anthropogenic GHG emissions generated in California:

- ▶ *Transportation*: On-road motor vehicles, off-road equipment, recreational vehicles, aviation, ships, and rail
- ▶ *Electric Power*: Use and production of electrical energy
- ▶ *Industrial*: Mainly stationary sources (e.g., boilers and engines) associated with process emissions
- ▶ *Commercial and Residential*: Area sources, such as landscape maintenance equipment, fireplaces, and consumption of natural gas for space and water heating
- ▶ *Agriculture*: Agricultural sources that include off-road farm equipment; irrigation pumps; crop residue burning (CO<sub>2</sub>); and emissions from flooded soils, livestock waste, crop residue decomposition, and fertilizer volatilization (methane and nitrous oxide)

- ▶ *High-GWP Gases:* Refrigerants for stationary- and mobile-source air conditioning and refrigeration, electrical insulation (e.g., sulfur hexafluoride), and various consumer products that use pressurized containers
- ▶ *Recycling and Waste:* Waste management facilities and landfills, primarily CO<sub>2</sub> emissions from combustion and methane from landfills and wastewater treatment

## STATE GREENHOUSE GAS EMISSIONS INVENTORY

ARB performs an annual GHG inventory for emissions of the major GHGs. As shown in Figure 4.7-1, California produced 459 million metric tons (MMT) of CO<sub>2</sub>e in 2012 (ARB 2014). Combustion of fossil fuels in the transportation category was the single largest source of California’s GHG emissions in 2012, accounting for 36% of total GHG emissions in the state. The transportation category was followed by the electric power category (including in- and out-of-state sources), which accounts for 21% of total GHG emissions in California, and the industrial category, which accounts for 19% of the state’s total GHG emissions (ARB 2014).



Source: ARB 2014

### Exhibit 4.7-1 2012 California Greenhouse Gas Emissions by Category

## LOCAL INVENTORY

In 2012, the Sierra Business Council and ICLEI – Local Governments for Sustainability (ICLEI) conducted a GHG emissions inventory for the unincorporated areas of Amador County. The inventory addressed emissions from communitywide activities based on the following emissions sectors: residential and commercial energy consumption (electricity, natural gas, propane, wood, and other fuel use), on-road transportation, solid waste, wastewater treatment, and off-road equipment (non-road fuel consumption, e.g., emergency generators; off-road recreational vehicles; and lawn equipment). Amador County updated the inventory in 2013 to be consistent with the most recent guidance, methodologies, and approaches from other jurisdictions in California.

This revised analysis found that the unincorporated areas of Amador County generated approximately 296,408 MT CO<sub>2</sub>e in 2005 (AECOM 2013). The sector with the greatest percentage of emissions was transportation (38%), followed by energy (i.e., electricity and natural gas consumption), consisting of residential, commercial,

and industrial emissions (34%). Off-road vehicles and equipment accounted for 10% of emissions, and all other sources accounted for the remaining emissions.

### 4.7.3 IMPACTS AND MITIGATION MEASURES

#### ANALYSIS METHODOLOGY

Construction-related GHG exhaust emissions would be generated by sources such as heavy-duty off-road equipment, trucks hauling materials to the site, and construction worker commutes. Construction-related emissions associated with typical construction activities, such as site grading and construction of the buildings, were modeled using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2 (CalEEMod 2013). CalEEMod allows the user to enter project-specific construction information, such as the types, number, and horsepower of construction equipment, and the number and length of off-site motor vehicle trips.

Operational GHG emissions may be both direct and indirect emissions, and would be primarily generated by energy and mobile sources associated with the Draft General Plan. Energy-source emissions would be associated with consumption of electricity and natural gas by the Draft General Plan land uses. Electricity-related GHG emissions would be considered indirect emissions because the emissions are generated in a different location and potentially different time from where the consumption occurs. Natural gas-related GHG emissions on the other hand are direct emissions because the emissions are generated at the same point of consumption. Mobile-source GHG emissions, which are also direct emissions, would include vehicle trips by residents, workers, and visitors to the retail land uses.

Other indirect GHG emission sources include solid waste disposal, wastewater treatment, and water consumption. Solid waste disposal and wastewater treatment from residential and commercial uses would result in indirect, off-site emissions of GHGs (i.e., the GHGs generated by decomposition of solid waste would occur at a different location from where that waste was generated). Consumption of water or treatment of wastewater would result in indirect GHG emissions because of the electricity consumption associated with the off-site conveyance, distribution, and treatment of water and wastewater.

CalEEMod was also used to estimate the operational GHG emissions associated with the Draft General Plan land uses, including transportation, electricity, natural gas, solid waste, water and wastewater, and area-source emissions. Vehicle fleet characteristics, energy consumption, waste generation, and water use and wastewater generation data specific to Amador County were used in place of CalEEMod defaults, where available. Additional details are included in Appendix C.

Although as mentioned previously Amador County developed a 2005 GHG emissions inventory, the 2005 inventory was not used as the baseline for the GHG analysis. Instead, consistent with CEQA requirements, the baseline for GHG analysis was modeled for existing conditions in 2013 and for the horizon year of the Draft General Plan in 2030.

#### THRESHOLDS OF SIGNIFICANCE

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. According to the Appendix G checklist, implementation of the Draft General Plan would result in a significant GHG emissions impact 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.



The analysis of GHG emissions in this EIR recognizes that the impact GHG emissions have on global climate change does not depend on whether they are generated by stationary, mobile, or area sources, or whether they are generated in one region or another. AB 32 demonstrates California’s commitment to reducing GHG emissions and the state’s associated contribution to climate change, without intending to limit population or economic growth within the state. Thus, to achieve the goals of AB 32, which are tied to mass GHG emission levels of a specific benchmark year (i.e., 1990), California would have to achieve a lower rate of emissions per unit of population (per person) and/or per level of economic activity (e.g., per job) than its current rate. Furthermore, to accommodate future population and economic growth, the state would have to achieve an even lower rate of emissions per unit than it achieved in 1990. For this reason, land uses need to be GHG “efficient” to attain AB 32 goals while accommodating population and job growth. Therefore, this analysis focuses on the annual operational GHG emissions per service population (annual GHG/service population), where service population is the number of residents plus the number of jobs. Table 4.7-1 shows the estimated statewide GHG emissions per service population for the years 2020 (consistent with ARB’s Scoping Plan) and 2030 (the horizon year of the Draft General Plan).

	<b>2020</b>	<b>2030</b>
Population	40,643,643	44,279,354
Total Employment <sup>1</sup>	16,846,600	18,353,585
Total Service Population <sup>1</sup>	57,490,243	62,632,939
Emissions Level Target (MT CO <sub>2</sub> e)	264,100,000	193,673,333
Emissions per Service Population (MT CO <sub>2</sub> e)	4.59	3.09
<p>Notes: Employment projection data is from the California Employment Development Department. Labor Market Information Division. May 23, 2012. Available: <a href="http://www.labormarketinfo.edd.ca.gov/LMID/Projections_of_Employment_by_Industry_and_Occupation.html">http://www.labormarketinfo.edd.ca.gov/LMID/Projections_of_Employment_by_Industry_and_Occupation.html</a>. Accessed August 13, 2014. The employment data is available for 2020. For years past 2020, employment data is extrapolated as a static percentage of the Department of Finance population projections. Population data is from California Department of Finance 2013 Forecasts. State of California, Department of Finance, Report P-1 (County): State and County Total Population Projections, 2010-2060. Sacramento, California, January 2013. Available: <a href="http://www.dof.ca.gov/research/demographic/reports/projections/P-1/">http://www.dof.ca.gov/research/demographic/reports/projections/P-1/</a>. Accessed August 13, 2014. Emissions level 2030 target is based on AB 32 emissions reduction target for 2020 and the annual emissions reductions needed to achieve the 2050 emissions reduction goal of Executive Order S-3-05, extrapolated to 2030, and estimated Amador County service population for 2030.</p> <p><sup>1</sup> Total employment and total service population does not include farming, mining, logging, or manufacturing jobs. Potential increases in process emissions from these sectors were not included in future emissions level projections, and so these employees are excluded from the service population. Statewide reduction measures reducing process emissions are expected for these sectors.</p>		

The application of an efficiency-based metric in this analysis is consistent with the discussion in ARB’s Scoping Plan of the importance of GHG efficiency in land use planning that must be achieved to attain the mandated reductions in mass annual GHG emission levels. Because the service population metric accounts for future population growth, future economic growth, and mass emission targets, future development that would not be more GHG efficient than “business as usual” would conflict with the goals of AB 32. The operational service population efficiency metric that will be used for evaluating significant impacts is 3.09 MT CO<sub>2</sub>e per service population per year in 2030.

## IMPACT ANALYSIS

**IMPACT 4.7-1** **Generation of GHG Emissions.** *GHG emissions generated under the Draft General Plan would exceed applicable GHG thresholds of significance; therefore, implementing Draft General Plan would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. This impact would be significant.*

Development associated with the Draft General Plan would occur over a large area, and large portions of the planning area could undergo construction at a given time. Construction activities were assumed to commence as early as 2013 and last until approximately 2030 (the time horizon of the Draft General Plan). Exhaust emission rates of the construction equipment fleet in California are expected to decrease over time due to advancements in engine technology, retrofits, and turnover in the equipment fleet that would result in increased fuel efficiency, potentially more alternatively fueled equipment, and lower levels of GHG emissions. GHG emissions were estimated consistent with the assumptions in Section 4.3, Air Quality. Construction-related GHG emissions were estimated at a maximum of 602 MT CO<sub>2</sub>e per year, or 10,234 MT CO<sub>2</sub>e over the entire construction period for the Draft General Plan. Annual construction emissions are shown in Table 4.7-2.

Operational GHG emissions were estimated for existing conditions and for emissions associated with development under the Draft General Plan in 2030. Regional area- and mobile-source emissions were modeled based on the proposed land use types and trip generation rates discussed in Section, 4.14. As shown in Table 4.7-2, the Draft General Plan would result in approximately 351,333 MT CO<sub>2</sub>e per year in 2030. Mobile sources are the largest source of emissions and represent approximately 73% of the total emissions. Energy consumption, including electricity and natural gas, is the next largest category at 21% of the total CO<sub>2</sub>e emissions.

<b>Emissions Source</b>	<b>Existing (MT CO<sub>2</sub>e)</b>	<b>Draft 2030 General Plan (MT CO<sub>2</sub>e)</b>	<b>Net Change</b>
Area	8,729	9,205	476
Energy	53,336	74,289	20,953
Mobile	197,106	256,555	59,449
Waste	3,614	5,897	2,283
Water	3,544	5,387	1,843
<b>Operational Emissions (MT CO<sub>2</sub>e)</b>	<b>266,329</b>	<b>351,333</b>	<b>85,004</b>
Annual Construction Emissions		602	
Total Annual Emissions		351,935	
Service Population	28,588,409	42,827	
<b>Emissions Per Service Population</b>	<b>9.3237</b>	<b>8.22</b>	
2030 Threshold (MT CO <sub>2</sub> e)		3.09	
Meets Threshold		NO	
Note: Totals may not add due to rounding. Source: Modeled by AECOM in 2014			

As shown in Table 4.7-2, the Draft General Plan would result in an operating GHG efficiency of 8.2 MT CO<sub>2</sub>e per service population per year. It is estimated that the Draft General Plan would accommodate 25,241 residents and 17,586 jobs in 2030 at the 2030 horizon year. Therefore, the total service population in 2030 would be 42,827. The total annual emissions of 351,935 MT CO<sub>2</sub>e were divided by the service population to estimate the efficiency metric of 8.2 MT CO<sub>2</sub>e per service population per year. The emissions associated with development under the

Draft General Plan would exceed the significance threshold of 3.09 MT CO<sub>2</sub>e per service population per year in 2030.

The Draft General Plan contains a variety of policies and programs aimed at reducing GHG emissions:

- ▶ Policy C-10.1: Evaluate the potential effects of climate change on the County’s human and natural systems and prepare strategies that allow the County to appropriately respond and adapt.
- ▶ Policy C-10.2: Develop and adopt a comprehensive strategy to reduce GHGs within Amador County by at least 15 percent from current levels by 2020.
- ▶ Policy C-10.3: Guide new development to areas where pedestrian and bicycle/NEV access to existing activity centers are possible, in order to reduce the need for automobile travel and VMT.
- ▶ Policy C-10.4: Work with service providers to ensure that transit offerings in the County are stable or expanding, and that transit is tailored to meet residents’ needs.
- ▶ Policy C-10.5: Require new development projects to incorporate building placement and design features to increase energy efficiency in new structures.
- ▶ Policy C-10.6: Support green building through incentives for Leadership in Energy and Environmental Design (LEED) certification of new commercial, industrial, public, and multi-family residential buildings. Promote incentives for compliance with this standard as a way to increase the energy efficiency of new structures. Promote increased energy efficiency and green building practices through the County’s use of these practices.
- ▶ Policy C-10.7: Support parcel-scale energy generation, including addition of solar panels for residential structures and cogeneration for larger commercial or industrial uses.

Reductions in GHG emissions are expected from regulatory measures not assumed in the EIR modeling analysis that will be developed under the mandate of AB 32, as identified and recommended in ARB’s Scoping Plan. The percentage of renewable resources for PG&E’s electricity mix is estimated to increase to 33% in 2020. CalEEMod assumes that all residential and commercial buildings would meet the 2008 Title 24 building code standards. However, the residential and commercial buildings in Amador County would be built to meet the 2013 Title 24 building code standards, which improve energy efficiency by 25% over the 2008 standards (CEC 2014). The 2013 Title 24 standards would also improve water use efficiency for the development associated with the Draft General Plan.

The rate of GHG emissions from development under the Draft General Plan is projected to decrease in subsequent years as the regulatory reductions increase under AB 32. Additionally, new technology improvements may become available or the feasibility of existing technologies may improve. Nonetheless, a complete picture of the future regulatory environment is unknown at this time. Additional GHG reduction measures promulgated under the AB 32 mandate may not be sufficient to cause future development under the Draft General Plan to achieve the GHG efficiency goal discussed above. Because it is uncertain the policies in the Draft General Plan would ensure that the region would meet the emission reduction goals of AB 32 or the significance threshold of 3.09 MT CO<sub>2</sub>e per service population per year in 2030. Therefore, long-term operational emissions associated with the Draft General Plan would result in a **significant** impact, which would be further increased by construction GHG emissions.

## Mitigation Measure 4.7-1a: Develop and Implement a Greenhouse Gas Reduction Plan

The County will develop and implement a GHG reduction plan. The GHG reduction plan will have three primary objectives: to reduce total greenhouse gas emissions in the county to 1990 levels by 2020 pursuant to the AB 32 GHG reduction targets, to the extent feasible to meet the 2030 efficiency metric of 3.09 MT CO<sub>2</sub>e per service population, and to create adaptation strategies to address the impacts of climate change on the county. As noted in Table 4.7-1, farming, mining, logging, and manufacturing jobs are not included in the jobs or emissions estimates and therefore this mitigation measure would not apply to those activities and sources. The contents of the GHG reduction plan would include:

- A description the County's rationale for developing and implementing the plan, describing state policy mandates to reduce GHG emissions.
- GHG emissions forecasts for 2020 and 2030. Forecasts will build upon the baseline GHG emissions inventory provided in the General Plan EIR for the base year 2005 (the AB 32 base year) , with any necessary updates.
- Emission reduction measures and actions. This will include a description of the feasible measures and actions that are necessary to reduce emissions in the County and achieve the reduction targets. Measures could include, but are not limited to the following and the Attorney General's Office mitigation measures (CAPCOA 2010) (CAPCOA 2010 documents the effectiveness of many of these measures in reducing GHG emissions):
  1. Increase density and location efficiency of new development.
  2. Improve pedestrian and transit access and amenities in new development.
  3. Implement trip reduction and carpool programs.
  4. Support telecommuting and alternative work schedules for new job-generating uses.
  5. Install programmable thermostat timers for new buildings.
  6. Use on-site renewable energy systems.
  7. Limit outdoor lighting requirements for new commercial properties.
  8. For new commercial land uses, employers allow telecommuting and alternative work schedules for employees.
  9. Provide electrical vehicle and carpool vehicle priority parking in new commercial sites.
  10. Install low-flow water fixtures in all new residential and commercial developments.
  11. Adopt a water conservative strategy applicable to all residential and commercial developments.
  12. Require commercial building landscaping to be water-efficient (e.g., native or drought-resistant plants, minimize turf and lawn area).
  13. Recycle demolished construction materials.
  14. Use alternative fuels, electric, and/or hybrid construction equipment.

15. Protection and adaptation strategies. This section will describe strategies, policies, and measures that will be used to protect the County from, and facilitate adaptation to, the potential effects of climate change.
16. Benchmarks, monitoring procedures, amendment requirements, and other steps needed to ensure the County achieves its emissions reduction, protection, and adaptation goals.
17. Re-evaluation of policies, and measures relevant to climate change in the General Plan each time the General Plan is updated.

**Responsible Agencies/Departments:** Planning Department

**Working With:** Amador Air District

**Time Frame:** Begin development upon adoption of the Draft General Plan

#### **Mitigation Measure 4.7-1b: Implement Interim Project-Specific Greenhouse Gas Reduction Measures**

Until a Greenhouse Gas Reduction Plan is adopted, the County will require discretionary projects to implement mitigation measures to reduce greenhouse gas emissions to help meet the 2020 emission reduction goals of AB 32 and the significance threshold of 3.09 MT CO<sub>2</sub>e per service population per year in 2030. This process will include:

- Evaluating project emissions compared to the 2020 emission reduction goals of AB 32 and the significance threshold of 3.09 MT CO<sub>2</sub>e per service population per year in 2030, and formulating feasible measures necessary for the project to demonstrate the ability to help meet these targets. Reduction potentials for adopted measures should be calculated using the most currently available research and literature and CAPCOA's *Quantifying Greenhouse Gas Mitigation Measures* report (CAPCOA 2010).
- Assessing VMT and implementing measures to reduce VMT, including but not limited to:
  1. Providing pedestrian, bicycle, and/or transit access, amenities, or funding, including (but not limited to) internal access, bike lanes, bike parking, ~~neighborhood electric vehicle networks~~, and ride sharing;
  2. Traffic calming measures to reduce vehicle speeds;
  3. Providing a mix of uses and density that support pedestrian and transit access;
- Assessing energy consumption and implementing measures to reduce energy use. Sample measures include but are not limited to installing energy efficient appliances and boilers, "cool" roofs and pavements, higher-efficiency interior and exterior lighting, and on-site renewable energy generation.
- Reducing water use, including but not limited to use of grey water, low-flow fixtures, water-efficient landscapes and irrigation systems, reduced turf, and native or drought-tolerant landscaping.

**Responsible Agencies/Departments:** Planning Department

**Working With:** Amador Air District

**Time Frame:** Ongoing until adoption of a Greenhouse Gas Reduction Plan

## Significance after Mitigation

Mitigation Measure 4.7-1a would require development of a formal GHG reduction plan that would ensure GHG reduce emissions to be consistent with the AB 32 2020 goal and to the extent feasible to meet the 2030 efficiency metric of 3.09 MT CO<sub>2</sub>e per service population. Mitigation Measure 4.7-1b would require that individual projects would implement measures to reduce GHG emissions during the interim period until the GHG reduction plan is adopted. However, it is unclear whether Mitigation Measures 4.7-1a and 4.7-1b would achieve the 2020 emission reduction goals of AB 32 and the 2030 efficiency metric of 3.09 MT CO<sub>2</sub>e per service population due to uncertainties in the timing and effectiveness of implementation of State GHG regulations, as well as uncertainties in the ability of feasible mitigation measures to achieve the 2020 goals and the 2030 efficiency metric. No additional feasible mitigation measures are available to reduce this impact to a less-than-significant level. Therefore, the impact would remain **significant and unavoidable**.

**IMPACT 4.7-2** **Conflict with a GHG Reduction Plan.** *The Draft General Plan would conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions because it would not achieve AB 32's emission reduction goals. This impact would be **significant**.*

As discussed earlier, the development associated with the Draft General Plan would exceed the threshold of significance for GHG emissions. The approach to developing a threshold of significance for GHG emissions is to identify the level of emissions for which a plan or project would not be expected to substantially conflict with existing California legislation, AB 32, that has been adopted to reduce statewide GHG emissions. Therefore, the Draft General Plan would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. This impact would be **significant**.

### Mitigation Measure: Implement Mitigation Measures 4.7-1a and 4.7-1b

## Significance after Mitigation

Mitigation Measure 4.7-1a would require development of a formal GHG reduction plan that would ensure GHG reduce emissions to be consistent with the AB 32 2020 goals and to the extent feasible to meet the 2030 efficiency metric of 3.09 MT CO<sub>2</sub>e per service population. Mitigation Measure 4.7-1b would ensure that individual projects would implement measures to reduce GHG emissions. However, it is unclear whether Mitigation Measures 4.7-1a and 4.7-1b would achieve the 2020 emission reduction goals of AB 32 and the 2030 efficiency metric of 3.09 MT CO<sub>2</sub>e per service population due to uncertainties in the timing and effectiveness of implementation of State GHG regulations, as well as uncertainties in the ability of feasible mitigation measures to achieve the 2020 goals and the 2030 efficiency metric. No additional feasible mitigation measures are available to reduce this impact to a less-than-significant level. Therefore, the impact would remain **significant and unavoidable**.