3.4 Greenhouse Gases and Climate Change

This section analyzes the effect of the proposed Visalia General Plan, including the draft Climate Action Plan, on energy resources and greenhouse gas emissions. The section identifies energy laws, plans, and policies; identifies energy sources; and describes existing and projected energy consumption and trends in the Planning Area. This section also analyzes qualitatively and quantitatively how implementation of the proposed General Plan may contribute to global climate change (GCC) through greenhouse gas (GHG) emissions related to land use changes and transportation.

Environmental Setting

PHYSICAL SETTING

Energy Use

Tulare County

Commercial and residential space heating and cooling comprise a large share of direct energy end use in Tulare County. Other major energy users include agricultural production, industrial facilities and electricity-generating power plants, which burn fossil fuels (generally natural gas) to convert those fuels to electricity. Electricity generation is typically classified as "indirect" energy use because the end product, electricity, is consumed at a location distinct from the power plant where it is produced. In Tulare County, electricity is supplied from power plants outside the county.

In Tulare County, as in most other places in the United States, automobiles and commercial vehicles (composed of small, medium, and large trucks) are the largest energy consumers in the transportation sector. Automobiles and commercial vehicles are generally fueled by diesel or gasoline.

Southern California Edison (SCE) provides most electricity service, while Southern California Gas Company (SoCalGas) provides most natural gas for Tulare County, including the largest cities in the Tulare County: Visalia, Tulare, and Porterville. Small portions of the northern edge and southwestern edge of the county receive electricity and natural gas from Pacific Gas & Electric. In 2006, Tulare County used approximately 146 million therms of natural gas and 3,633 million kilowatt-hours (kWh) of electricity, across all sectors.[1]

[1] California Energy Commission. 2012. Source: http://ecdms.energy.ca.gov/

Visalia Energy Use

SCE provides electricity and SoCalGas provides natural gas to Visalia homes and businesses. SCE obtains energy from power plants, natural gas fields, and renewable energy sources in southern California and the Central Valley and delivers electricity through high voltage transmission lines. Electrical power is delivered to homes via various distribution feeders located throughout the City. SoCalGas has four storage fields throughout southern California and a system of compressor stations and transmission pipelines to deliver natural gas. The availability of electricity and gas services is not expected to become an issue during the General Plan planning horizon since all homes are located within the Urban Development Boundary, adjacent to or relatively close to existing development. While supply is not anticipated to be an issue in Visalia, reducing demand for these resources will help reduce energy use and overall carbon emissions. The majority of electricity and natural gas is used in buildings, and green building techniques can result in less energy demand in new and retrofitted structures.

The City of Visalia has undertaken an number of initiatives to become a model green community, through purchasing compressed natural gas (CNG) buses and solid waste trucks, building a CNG refueling facility, purchasing electric-hybrid vehicles, and installing photovoltaic (PV) systems at the airport, bus shelters and Transit Center. The City also operates a methane digester and generator at the Water Conservation Plant, which converts methane generated by wastewater processing into energy. In 2008, the City became a partner with the San Joaquin Valley Clean Energy Organization (SJVCEO) to undertake GHG reduction plans, which ultimately led to the development of a draft Climate Action Plan (CAP). In 2011, the City conducted a series of comprehensive energy audits funded through the City's Energy Efficient Conservation Block Grant (EECBG) Program. The audits identified 73 energy efficiency measures to be implemented at 19 public facilities. The City received a loan from the California Energy Commission (CEC) to implement the energy efficiency measures.

Global Climate Change

Global Climate Change (GCC) refers to a change in the average air temperature that may be measured by wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the distant past, such as during previous ice ages. The rate of temperature change has typically been incremental, with warming and cooling occurring over the course of thousands of years. In the past 10,000 years the earth has experienced incremental warming as glaciers retreated across the globe. However, scientists have observed an unprecedented increase in the rate of warming over the past 150 years, roughly coinciding with the global industrial revolution.

Although GCC is now generally accepted by the public, the extent and speed of change to be expected, and the exact contribution from human sources, remains in debate. Nonetheless, the Intergovernmental Panel on Climate Change (IPCC)[2]—made up of the world's leading climate

[2] The Intergovernmental Panel on Climate Change (IPCC) is a scientific intergovernmental body set up by the World Meteorological Organization (WMO) and by the United Nations Environment Programme (UNEP). Its role is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts, and options for adaptation and mitigation.

scientists—have reached consensus that global climate change is "very likely" caused by humans, and that hotter temperatures and rising sea levels will continue for centuries to come. In particular, human influences have:

- *very likely* contributed to sea level rise and increased storm surge during the latter half of the 20th century;
- *likely* contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns;
- *likely* increased temperatures of extreme hot nights, cold nights, and cold days;
- *more likely than not* increased the risk of heat waves, area affected by drought since the 1970s, and frequency of heavy precipitation events.[3]

The IPCC predicts that the increase in global mean temperature from 1990-2100 could range from 2.0 to 11.5 degrees Fahrenheit, with the most likely scenario between 3.2 and 7.1 degrees. The same report projects a sea level rise of seven to 23 inches by the end of the century, with a greater rise possible depending on the rate of polar ice sheet melting.

Other Climate Change Impacts and Adaptation

According to the California Climate Action Team (CCAT), accelerating GCC has the potential to cause a number of adverse impacts in California, including but not limited to: a shrinking Sierra snowpack that would threaten the state's water supply; public health threats caused by higher temperatures and more smog; damage to agriculture and forests due to reduced water storage capacity, rising temperatures, increasing salt water intrusion, flooding, and pest infestations; critical habitat modification and destruction; eroding coastlines; increased wildfire risk; and increased electricity demand.[4] These impacts have and will continue to have considerable costs associated with them.

While all of these impacts may be felt to some extent in the Central Valley, of particular concern to Visalia are water quality and water supply issues; public health threats caused by increased temperature and extreme heat events; and an imbalance between electricity supply and demand. The following paragraphs describe in more detail some of the most relevant impacts to the environment that could result from continued global warming.[5]

Increased Temperatures and Extreme Heat Events

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. Climate models predict a 4°F temperature increase in the next 20 to 40 years, with an increase in the number of long dry spells.

[3] IPCC, 2007.

[4] CCAT, 2006.

[5] California Natural Resources Agency, 2009.

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. Over the past 15 years, heat waves have claimed more lives in the state than all other declared disaster events combined.[6]

Increased temperatures also pose a risk to human health when coupled with high concentrations of ground-level ozone and other air pollutants, which may lead to increased rates of asthma and other pulmonary diseases. The incidence of bad air days in California's urban areas has increased, mostly in the summer. On long, hot, stagnant days, ground level ozone can build up to levels that violate federal and state health-based standards. Recent studies indicate that hot days correlate with poor air quality days, and air pollution is contributing to more annual deaths and cases of respiratory illness and asthma.[7] For more discussion of air quality impacts, see Chapter 3.3: Air Quality. Other impacts related to increased temperatures and heat waves include:

- **Increased urban heat island effect:** urban heat islands are especially dangerous because they are both hotter during the day and do not cool down at night, increasing the risk of heat-related illness;
- **Reduced freezing events:** too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off. In addition, certain agricultural crops depend on freezing as part of the life-cycle, so fewer such events would impact California's food production and indirectly the food supply in Visalia;
- **Increased energy demand:** it is expected that energy, particularly electricity, demand will increase in order to meet increasing demands for air conditioning and refrigeration.

Changes in Precipitation and Extreme Events

Climate change is anticipated to cause a 20-30 percent increase in precipitation in the spring and fall in California. More frequent and heavier precipitation events cause flooding and mudslides, which would incur considerable costs in damages to property, infrastructure and even human life. Such events also are associated with drinking water contamination outbreaks; contamination of shellfish and other food-borne illnesses; and overloading of wastewater and stormwater systems.

With warmer average temperatures, more winter precipitation will fall in the form of rain instead of snow, shortening the winter snowfall season and accelerating the rate at which the snowpack melts in the spring. Not only does such snow melt increase the threat for spring flooding, it will decrease the Sierras' capacity as a natural water tower, resulting in decreased water availability for agricultural irrigation, hydro-electric generation and the general needs of a growing population. The decrease in snow-pack is particularly relevant in California, as the Sierra snow-pack provides approximately 80 percent of California's annual water supply. A decreased snowpack would result in increased drought conditions; water supply and quality impacts; and food production impacts.

[6] California Natural Resources Agency, 2009.

[7] Jacobson, 2008.

Drought conditions also result in increased frequency, intensity, and duration of wildfires. In these conditions, fires burn hotter and spread faster. During 2003, there were 14 reported fires in California that were enhanced due to Santa Ana winds and very low levels of humidity. The estimated damage costs were over $2 million. In addition to fatalities and property damage, smoke from wildfires impairs air quality and can cause acute and chronic health impacts.

Impacts on Plants and Vegetation

Native plants and animals are also at risk as temperatures rise. Scientists are reporting more species moving to higher elevations or more northerly latitudes in response. Increased temperatures also provide a foothold for invasive species of weeds, insects and other threats to native species. The increased flow and salinity of water resources could also seriously affect the food web and mating conditions for fish that are of both of economic and recreational interest to residents. In addition, the natural cycle of plant's flowering and pollination, as well as the temperature conditions necessary for a thriving locally adapted agriculture could be affected, with perennial crops such as grapes taking years to recover. In California, the impacts of climate change on agriculture are estimated by the Farm Bureau to be $30 billion, mostly due to changes in chill hours required per year for cash crops.

Diseases

Warming temperatures, fewer freezing spells, and increased precipitation are likely to change the distribution and quantity of common disease vectors, such as mosquitos, ticks, and rodents.

Greenhouse Gases

Gases that trap heat in the Earth's atmosphere are called greenhouse gases (GHGs). These gases play a critical role in determining the Earth's surface temperature. Some of the solar radiation that enters Earth's atmosphere is absorbed by the Earth's surface, and some is reflected back toward space. Of the radiation reflected back toward space, GHGs will absorb a part. As a result, radiation that otherwise would have escaped back into space is retained, resulting in a warming of the atmosphere. Some level of GHGs is essential for maintaining temperatures supportive of life on Earth. Without naturally-occurring GHGs, the Earth's surface would be about 61°F cooler.[8] This phenomenon is known as the greenhouse effect, and is not, of itself, a bad thing. However, many scientists believe that emissions from human activities—such as electricity generation, vehicle emissions, and even farming and forestry practices—have elevated GHGs in the atmosphere beyond naturally-occurring concentrations, contributing to global climate change. The six primary GHGs are:

- **Carbon dioxide (CO_2),** emitted when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned;
- **Methane (CH_4),** produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion;

[8] CCAT, 2006.

- **Nitrous oxide (N_2O),** typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning;
- **Hydrofluorocarbons (HFCs),** primarily used as refrigerants;
- **Perfluorocarbons (PFCs),** originally introduced as alternatives to ozone depleting substances (such as HFCs) and typically emitted as by-products of industrial and manufacturing processes; and
- **Sulfur hexafluoride (SF_6),** primarily used in electrical transmission and distribution systems.

Though there are other gases that can contribute to global warming, these six are identified explicitly in California legislation and litigation as being of primary concern. GHGs have varying potentials to trap heat in the atmosphere. The potential is typically measured using two parameters: global warming potential (GWP), and atmospheric lifetimes. Measurements of GWP range from 1 for CO_2 to 23,900 for SF_6. GHG emissions with a higher GWP have a greater global warming effect on a molecule-by-molecule basis. For example, one ton of CH_4 has the same contribution to the greenhouse effect as approximately 21 tons of CO_2.[9] GWP is alternatively described as "carbon dioxide equivalents", or CO_2e. The second parameter, "atmospheric lifetime" describes how long it takes to restore the system to equilibrium following an increase in the concentration of a GHG in the atmosphere. Atmospheric lifetimes of GHGs can range from tens to thousands of years.

California GHG Emissions

GHG emissions contributing to GCC are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors.[10] The State of California alone produced almost 500 million metric tons of CO_2, making California the second largest emitter in the United States after Texas, and about 12th in the world. Major sources in California include fossil fuel consumption from transportation (38 percent), industry (20 percent), electricity production (25 percent), residential (6 percent), and agricultural (6 percent) sectors.[11] Much like nations around the world, the California government is looking at options and opportunities for drastically reducing GHG emissions with the hope of thereby delaying, mitigating, or preventing some of the anticipated impacts of GCC on California communities.

The Global Warming Solutions Act of 2006 (AB 32) required that the California Air Resources Board (CARB) determine the statewide greenhouse gas emissions level in 1990. Based on its 1990-2004 inventory work, ARB staff set 427 million metric tons of carbon dioxide equivalent emissions ($MMTCO_2e$) as the total statewide greenhouse gas 1990 emissions level, and the 2020 emissions limit. The CARB approved the 2020 limit on December 6, 2007.[12] This would be about

[9] California Climate Action Registry, 2009.

[10] CEC, 2007, 19.

[11] CEC, 2007.

[12] CARB, 2008.

9.7 $MTCO_2e$ per capita, based on the Department of Finance's state population projection of 44 million.

Visalia GHG Emissions

Visalia's 2013 draft Climate Action Plan (CAP) provides an inventory of community-wide GHG emissions within the City in 2005. Total 2005 community emissions were estimated to be 906,337 metric tons of carbon dioxide equivalents (CO_2e). Emissions by sector are transportation (55 percent), commercial/industrial (23 percent), residential (22 percent), and solid waste (minus 1 percent), as shown in **Table 3.4-1**. The largest sources of community GHG emissions were gasoline (38 percent), electricity (26 percent), natural gas (17 percent), and diesel (17 percent).

Table 3.4-1 Visalia's 2005 Community Emissions Summary by Sector

Community Sectors	*CO_2e (metric tons)*	*% CO_2e All Sectors*
Transportation	500,112	55%
Commercial/Industrial	210,634	23%
Residential	202,453	22%
Solid Waste*	-7,862	-1%
Total	**906,337**	**100%**

*The negative figure is a result of GHG emissions avoided specifically from composting and recycling efforts

Source: Visalia Climate Action Plan, 2013, Table 1.

REGULATORY SETTING

The regulation of greenhouse gases is changing constantly as nations, and the U.S. federal, state, and local governments work to determine strategies that will work to systematically reduce GHG emissions and the impacts of climate change. GHG regulation is also intertwined with regulation of energy production and distribution. The regulations listed below reflect a tailored list of relevant actions the federal and state governments have taken to address energy, greenhouse gases, and global climate change.

Federal Regulations

Section 202 GHG Regulation of Cars and Light Duty Trucks

This rule was proposed jointly by EPA and the National Highway Traffic Safety Administration (NHTSA) to create a National Program of GHG emission standards and Corporate Average Fuel Economy (CAFE) standards. The standards apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards are designed to achieve a national vehicle fleet whose emissions and fuel economy performance improves year over year. The goal is to reduce CO_2 emissions by 960 million metric tons and save 1.8 billion barrels of oil over the lifetime of the vehicles sold in model years 2012 through 2016.[13]

[13] US EPA, 2010.

The final rule was signed on April 1, 2010 and will become effective 60 days after its publication in the Federal Register.

Renewable Fuel Standard Program

Finalized on February 3, 2010, this rule makes changes to the Renewable Fuel Standard (RFS) program, as required by the Energy Independence and Security Act of 2007. The original RFS program was designed to implement the provisions of the Energy Policy Act of 2005 (EPAct, described later). The revised statutory requirements establish new specific volume standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that must be used in transportation fuel each year. The revised statutory requirements also include new definitions and criteria for both renewable fuels and the feedstocks used to produce them, including new greenhouse gas emission thresholds for renewable fuels.

Greenhouse Gas Findings (2009)

In the U.S. Supreme Court case Massachusetts v EPA (2007), 12 states, three cities, and 13 environmental groups filed suit that the EPA should be required to regulate carbon dioxide and other greenhouse gases as pollutants under the federal Clean Air Act. In April 2007, the U.S. Supreme Court found that the EPA has a statutory authority to formulate standards and regulations to address greenhouse gases, which it historically has not done. On December 7, 2009, the Environmental Protection Agency Administrator finalized two findings to be effective January 14, 2010. The findings are related to greenhouse gases under section 202(a) of the Clean Air Act. These findings do not themselves impose any requirements on industry or other entities.

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare.[14]

Executive Order 13154 Federal Leadership in Environmental, Energy, and Economic Performance

On October 5, 2009, President Obama issued Executive Order 13154, which instructs federal agencies to set or achieve various emissions reduction and energy and environmental benchmarks by 2015, 2020, and 2030. The order requires agencies to set GHG emissions reduction targets for 2020 within 90 days, and requires OMB to set a federal government target for 2020 within 120 days. The order also sets out required reductions in vehicle fleet petroleum use and requires increases in water and energy efficiency and in recycling and waste diversion rates. The order also mandates adoption of certain contract and procurement practices designed to promote energy and water efficiency and environmentally-preferable products.

[14] US EPA, 2009.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 was designed to improve vehicle fuel economy and help reduce U.S. dependence on oil. The Act establishes several key standards:

- Increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels; and
- Reduces U.S. demand for oil by setting a National Fuel Economy Standard of 35 miles per gallon by 2020—an increase in fuel economy of 40 percent.

Energy Policy and Conservation Act, and CAFE Standards

The Energy Policy and Conservation Act (EPCA) of 1975 declared it to be U.S. policy to establish a reserve of up to 1 billion barrels of petroleum, and established nationwide fuel economy standards in order to conserve oil. Pursuant to this Act, the National Highway Traffic and Safety Administration, part of the U.S. Department of Transportation, is responsible for revising existing fuel economy standards and establishing new vehicle fuel economy standards.

The Corporate Average Fuel Economy (CAFE) program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Compliance with CAFE standards is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. The CAFE values are a weighted harmonic average of the EPA city and highway fuel economy test results. Based on information generated under the CAFE program, the U.S. Department of Transportation is authorized to assess penalties for noncompliance.

CAFE rules require the average fuel economy of all vehicles of a given class that a manufacturer sells in each model year to be equal or greater than the standard. CAFE standards apply to passenger cars and light trucks (gross vehicle weight of 8,500 pounds or less). Heavy-duty vehicles (i.e. gross vehicle weight over 8,500 pounds) are not currently subject to fuel economy standards. The EPCA was reauthorized in 2000 (49 CFR 533). The Energy Independence and Security Act of 2007 revised CAFE standards for the first time in 30 years, followed quickly by Section 202 GHG Regulation of Cars and Light Duty Trucks, which calls for further revision of the CAFE standards. Both of those regulations are described above.

Energy Policy Acts of 1992, 2005, etc. (EPAct)

The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. The Act also requires states to consider a variety of incentive programs to help promote AFVs. The Energy Policy Act of 2005 includes updated provisions for renewed and expanded tax credits for electricity generated by qualified energy

sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

Tax Credit for Wind-Generated Electricity

Beginning in the late 1990s, Congress introduced a tax subsidy on the production of renewable wind-generated electricity. The availability, expiration, and potential extension of the Production Tax Credit cause the boom and bust production of energy that typifies wind development in the United States. The Production Tax Credit's limitations have determined the role of the wind energy industry in the United States and contributed to the dominance of electric utility subsidies.

Energy Star Program

Energy Star is a joint program of the United States Environmental Protection Agency and the Department of Energy. The program establishes criteria for energy efficiency for household products and labels energy efficient products with the Energy Star seal. Homes can be qualified as "Energy Star homes" if they meet efficiency standards. In California, Energy Star homes must use at least 15 percent less energy than standards set by Title 24, pass the California Energy Star Homes Quality Insulation Installation Thermal Bypass Checklist Procedures, have Energy Star windows, and have minimal duct leakage.

Global Change Research Act (1990)

The purpose of the legislation was: "…to require the establishment of a United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions towards international protocols in global change research, and for other purposes." To that end, the Global Change Research Information Office (GCRIO) was established in 1991 (it began formal operation in 1993) to serve as a clearinghouse of information. The Act requires a report to Congress every four years on the environmental, economic, health and safety consequences of climate change; however, the first and only one of these reports to-date, the National Assessment on Climate Change, was not published until 2000. In February 2004, operational responsibility for GCRIO shifted to the U.S. Climate Change Science Program.

State Regulations

California Attorney General Actions

The California Attorney General's office has taken several actions to ensure that California meets its greenhouse gas reduction targets.[15] Examples of the Office of Attorney General's efforts since 2006 include taking companies in the power industry and the auto industry to task for their contributions to global warming and writing letters or submitting oral testimony in over 50 CEQA environmental review processes involving city general plans, county general plans, regional transportation plans, and specific projects throughout California.

[15] The Attorney General's web portal for global warming may be found at http://ag.ca.gov/globalwarming The portal contains information on global warming generally, impacts in California, and documentation of the comments, speeches, op-eds, testimony, and litigation actions he has taken to support AB 32 goals.

CEQA Guidelines Appendix F: Energy Conservation

Appendix F of the CEQA Guidelines describes the types of information and analyses related to energy conservation that are to be included in Environmental Impact Reports (EIRs). Energy conservation is described in terms of decreasing per capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas, and oil; and increasing reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects (to the extent relevant and applicable to the proposed Project), with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

Executive Order S-13-08 (Gov. Schwarzenegger, November 2008)

This Order directs state agencies to plan for sea level rise and climate change impacts. There are four key actions in the Order, including: (1) 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; (2) 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; (3) issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects; and (4) initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise.

Sustainable Communities and Climate Protection Act of 2008 (Chapter 728, Statutes of 2008)

The Sustainable Communities and Climate Protection Act of 2008, otherwise known as Senate Bill (SB) 375, establishes a process for CARB to implement the state's global warming legislation (AB 32) for the transportation sector by requiring CARB to adopt regional GHG targets for emissions associated with the automobile and light truck sector. SB 375 requires MPOs such as MTC to develop a Sustainable Communities Strategy (SCS)—a new element of the regional transportation plan (RTP)—to strive to reach these GHG reduction targets.

On June 30, 2010, CARB released proposed 2020 targets for the State's four largest MPO regions including the San Joaquin Valley. The targets propose a five to ten percent reduction in per capita GHG emissions from 2005 levels for each region. Although CARB found that there is insufficient technical information to establish firm targets for 2035, the agency has proposed placeholder targets for each of the four largest regions. Based on the work that has already been done by the Tulare County Association of Governments (TCAG) and other San Joaquin Valley MPOs, the 2030 target for this region is a 5 percent reduction per capita from 2005 levels by 2020 and an 8 percent reduction per capita by 2030.

SB 375 provides assurance that transportation projects programmed for funding prior to 2012 and contained in the 2009 federal transportation improvement program, funded by Proposition 1B, or a voter approved sales tax measure approved prior to 2009 will not be subject to new environmental scrutiny under the bill's provisions.

SB 375 ties the regional housing needs assessment (RHNA) process to the RTP process, requires local governments to rezone their general plans consistent with the updated housing element

within three years of adoption, and provides that RHNA allocations must be consistent with the development pattern in the SCS. It moves the RHNA process to an eight-year cycle from the current five-year one. Also, SB 375 provides a California Environmental Quality Act (CEQA) exemption or a streamlined process for housing and mixed-use projects that meet specified criteria, such as proximity to transit.

California Building Code

Title 24, Part 6, of the California Code of Regulations is the California Building Code, governs all aspects of building construction. Included in Part 6 of the Code are standards mandating energy efficiency measures in new construction. Since its establishment in 1977, the building efficiency standards (along with standards for energy efficiency in appliances) have contributed to a reduction in electricity and natural gas costs in California. The standards are updated every three years to allow new energy efficiency technologies to be considered. The latest update to Title 24 standards became effective in January 2007. The standards regulate energy consumed in buildings for heating, cooling, ventilation, water heating, and lighting. Title 24 is implemented through the local plan check and permit process.

CalGreen, the nation's first Green Building Standards Code, became effective in August 2009 for voluntary compliance and local adoption, and became effective for mandatory compliance on January 1, 2011. This Code establishes minimum standards for new construction that are intended to help the State achieve the AB 32 goal of reducing GHG emissions to 1990 levels by 2020. In addition to energy efficiency standards, CalGreen includes mandatory measures for water conservation, storm water drainage and retention, material conservation, and construction waste reduction. The requirements for nonresidential construction also include parking, landscaping, and other standards. Local jurisdictions have the option of adopting procedures by ordinance to improve the level of construction beyond the CalGreen minimum standard.[16]

Executive Order S-01-07 (Gov. Schwarzenegger, January 2007)

This Order calls for a statewide goal to be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 ("2020 Target"), and that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. Further, it directs CARB to determine if an LCFS can be adopted as a discrete early action measure pursuant to AB 32, and if so, consider the adoption of a LCFS by June 30, 2007, pursuant to Health and Safety Code Section 38560.5. The LCFS applies to all refiners, blenders, producers or importers ("Providers") of transportation fuels in California, will be measured on a full fuels cycle basis, and may be met through market-based methods by which Providers exceeding the performance required by a LCFS shall receive credits that may be applied to future obligations or traded to Providers not meeting the LCFS.

In June 2007, CARB approved the LCFS as a Discrete Early Action item under AB 32. The LCFS rulemaking package was filed with the Office of Administrative Law (OAL) on November 25, 2009. The OAL approved the LCFS rulemaking and filed with the Secretary of State on January 12, 2010.

[16] California Building Standards Commission, 2010.

Senate Bill 97 (Chapter 185, Statutes of 2007)

Senate Bill (SB) 97 directs the Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency guidelines for feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009. The Natural Resources Agency was required to certify and adopt amendments to the Guidelines implementing the California Environmental Quality Act ("CEQA Guidelines") on or before January 1, 2010. In keeping with SB 97, OPR proposed amendments to the CEQA Guidelines for the mitigation of greenhouse gas emissions and transmitted them to the Resources Agency for rulemaking on April 13, 2009. The Resources Agency adopted the amendments on December 30, 2009. On February 16, 2010, the OAL approved the amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010.

Implementation of the Alternative and Renewable Fuel and Vehicle Technology Program

AB 118 (Chapter 750, Statutes of 2007) directs the California Energy Commission to develop the Alternative and Renewable Fuel and Vehicle Technology Program. Crucial to implementing the Program is the development and adoption of an Investment Plan. The Investment Plan will establish priorities and opportunities for the Program, and describe how funding will complement existing public and private investments, including existing state programs. The Investment Plan will be updated annually.

California Global Warming Solutions Act of 2006 (AB 32)

This Act (Health and Safety Code Section 38500 et. seq.) requires the reduction of statewide total GHG emissions to 1990 levels by the year 2020. This change, which is estimated to be a 25 to 35 percent reduction from current emission levels, will be accomplished through an enforceable statewide cap on GHG emissions that will be phased-in starting in 2012. The Act also directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources and address GHG emissions from vehicles. CARB has stated that the regulatory requirements for stationary sources will be first applied to electricity power generation and utilities, petrochemical refining, cement manufacturing, and industrial/commercial combustion. The second group of target industries will include oil and gas production/distribution, transportation, landfills and other GHG-intensive industrial processes.

Executive Order S-20-06 (Gov. Schwarzenegger, October 2006)

This Order establishes the authority and roles of various departments and leadership roles in implementing AB 32.

Executive Order S-06-06 (Gov. Schwarzenegger, April 2006)

This Order was to establish biomass production and use targets for California. Biomass is a large but primarily unused resource including residues from forestry, urban, and agricultural wastes and can be used to create electricity, transportation fuels, and biogas. Use of biomass could not only increase energy production but also reduce the waste stream. The Order states that biomass should comprise 20 percent of the State's Renewables Portfolio Standard for 2010 and 2020, and California shall produce a minimum of 20 percent of its biofuels within the state by 2010, 40

percent by 2020, and 75 percent by 2050. Additional funding and research will go to further developing these technologies and integrating them into use.

Senate Bill 1368 (Chapter 598, Statutes of 2006)

Senate Bill (SB) 1368 requires the California Public Utilities Commission (PUC) to establish a GHG emissions performance standard for "baseload" generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) was required to establish a similar standard for local publicly-owned utilities by June 30, 2007. The legislation further required that all electricity provided to California, including imported electricity, must be generated from plants that meet or exceed the standards set by the PUC and the CEC. In January 2007, the PUC adopted an interim performance standard for new long-term commitments (1,100 pounds of CO_2 per megawatt-hour), and in May 2007, the CEC approved regulations that match the PUC standard.

State Alternative Fuels Plan (Chapter 371, Statutes of 2005)

Assembly Bill (AB) 1007, the State Alternative Fuels Plan, required the CEC to prepare a state plan to increase the use of alternative fuels in the transportation sector in California. The CEC prepared the State Alternative Fuels Plan (Plan) in partnership with the California Air Resources Board and in consultation with the other state, federal, and local agencies. The Plan was adopted in October 2007. The Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. Specific strategies include combining private capital investment, financial investment, technology advancement, investment in infrastructure, and others. The Plan also assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

Executive Order S-3-05 (Gov. Schwarzenegger, June 2005)

This Order recognizes California's vulnerability to climate change, noting that increasing temperatures could potentially reduce snow pack in the Sierra Nevada, which is a primary source of the State's water supply. Additionally, according to this Order, climate change could influence human health, coastal habitats, microclimates, and agricultural yield. The Order set the greenhouse gas reduction targets for California: By 2010, reduce GHG emissions to 2000 levels; by 2020 reduce GHG emissions to 1990 levels; by 2050 reduce GHG emissions to 80 percent below 1990 levels. This corresponds to an approximate 27 percent reduction by 2030 to 1990 levels, or 55 CO_2e in total emissions which correlates to 41 percent reduction over today's levels by 2030.

Executive Order S-20-04 (Gov. Schwarzenegger, July 2004)

This Order requires that the State commit to aggressive action to reduce state building electricity use, and more specifically, State agencies, departments, and other entities, take measures to reduce energy use by 20 percent by 2015. In addition, the Order requires that the CEC increase energy efficiency standards by 20 percent by 2015, compared to the 2003 Titles 20 and 24 standards.

State of California Energy Action Plans

The CEC is responsible for preparing the State Energy Action Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. At the beginning of 2008, the Energy Commission and CPUC determined that an Update to the 2005 California Energy Action Plan would be more appropriate than a new plan given the passage of Assembly Bill 32 and the critical role it will play in energy policy in coming years. The 2008 Update shifts focus to climate change. The nine major action areas, as described in previous Energy Action Plans include: energy efficiency; demand response; renewable energy; electricity adequacy, reliability, and infrastructure; electricity market structure; natural gas supply, demand, and infrastructure; transportation fuels supply, demand, and infrastructure; research, development, and demonstration; and climate change. The report emphasizes the importance of improving fuel standards in order to reduce energy use and greenhouse gas emissions, and notes the importance of also incorporating smart growth and land use policies.

Integrated Energy Policy Reports

Senate Bill 1389 (Chapter 568, Statutes of 2002) requires that the CEC prepare a biennial integrated energy policy report that contains an integrated assessment of major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (Public Resources Code Section 25301[a]). The 2009 Integrated Energy Policy Report is the most current report to fulfill the requirement of SB 1389. According to the 2009 report: "as California pursues its goal to address climate change by reducing greenhouse gas emissions, the driving force for the state's energy policies continues to be maintaining a reliable, efficient, and affordable energy system that minimizes the environmental impacts of energy production and use. Although the economic downturn has reduced energy demand in the short-term, demand is expected to grow over time as the economy recovers. It is essential that the state's energy sectors be flexible enough to respond to future fluctuations in the economy and that the state continue to develop and adopt the "green" technologies that are critical for long-term reliability and economic growth."

California Renewables Portfolio Standard Program (2002)

Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward by SB 1078 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least one percent each year. The outcomes of this legislation will impact regional transportation powered by electricity.

Assembly Bill 1493 (Chapter 200, Statutes of 2002)

Assembly Bill (AB) 1493 (Pavley) amends Health and Safety Code sections 42823 and 43018.5 requiring the California Air Resources Board (CARB) to develop and adopt regulations that achieve maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in

California. The regulations prescribed by AB 1493 may not take effect prior to January 1, 2006, and they apply only to 2009 and later model years.

In September 2004, pursuant to AB 1493, the CARB approved regulations to reduce greenhouse gas emissions from new motor vehicles. Under the regulation, one manufacturer fleet average emission standard is established for passenger cars and the lightest trucks, and a separate manufacturer fleet average emission standard is established for heavier trucks. The regulation took effect on January 1, 2006 and set near-term emission standards, phased in from 2009 through 2012, and mid-term emission standards, phased in from 2013 through 2016 (referred to as the Pavley Phase 1 rules). The CARB intends to extend the existing requirements to obtain further reductions in the 2017 to 2020 timeframe (referred to as Pavley Phase 2 rules). EPA at first refused to grant a waiver that would allow California to implement these standards, and California has challenged this action in federal court. On January 26, 2009, President Obama directed that EPA assess whether the denial of the waiver was appropriate. On June 30, 2009, EPA granted the waiver request, which begins with motor vehicles in the 2009 model year. The CARB calculates that in calendar year 2016, the Pavley Phase 1 rules will reduce California's GHG emissions by 16.4 million metric tons of carbon dioxide equivalents, and by 2020, Pavley Phase 2 would reduce emissions by 31.7 million metric tons of carbon dioxide equivalents. The AB 1493 vehicle requirements would cumulatively produce 45 percent more GHG reductions by 2020 compared to the federal CAFE standard in the Energy Independence and Security Act of 2007,[17] but roughly equivalent reductions to the latest national agreement resulting in even more stringent CAFE standards (Section 202 GHG Regulation of Cars and Light Duty Trucks, described under federal regulations, above).

Senate Bill 1771 (Chapter 1018, Statutes of 2000)

Senate Bill (SB) 1771 requires the CEC to prepare an inventory of the State's greenhouse gas emissions, to study data on global climate change, and to provide government agencies and businesses with information on the costs and methods for reducing greenhouse gases. It also established the California Climate Action Registry to serve as a certifying agency for companies and local governments to quantify and register their greenhouse gas emissions for possible future trading systems.

Reducing Dependence on Petroleum Assembly Bill 2076 (Chapter 936, Statutes of 2000)

In response to Assembly Bill (AB) 2076, the CEC and the California Air Resources Board prepared and adopted a joint agency report, Reducing California's Petroleum Dependence. Included in this report are recommendations to increase the use of alternative fuels to 20 percent of on-road transportation fuel use by 2020 and 30 percent by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita vehicles miles traveled.[18] Further, in response to the CEC's 2003 and 2005 Integrated Energy Policy Reports, the Governor directed the CEC to take the lead in developing a long-term plan to increase alternative fuel use. A performance-based goal is to reduce petroleum demand to 15 percent below 2003 demand.

[17] CARB, 2008.

[18] CEC, CARB, 2003.

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates Investor-Owned Utilities (IOUs) including those that offer electric, natural gas, steam, and petroleum service to consumers. The CPUC regulates both electric and natural gas rates and services provided by these utilities including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing. Natural gas regulations are found in General Orders 58, 94, 96, and 112, while electrical distribution regulations are found in General Orders 95, 128, 131, 165, and 166.

Local Regulations

San Joaquin Valley Air Pollution Control District

SJVAPCD adopted a Climate Change Action Plan (CCAP) in August 2008. While the plan does not have regulatory powers, it directs SJVAPCD to develop guidance to assist District staff, valley businesses, land-use agencies, and other permitting agencies in addressing GHG emissions as part of the CEQA process. The CCAP also directs District staff to investigate and develop a greenhouse gas banking program, enhance the existing emissions inventory process to include greenhouse gas emissions reporting consistent with new state requirements, and administer voluntary greenhouse gas emission reduction agreements. The CCAP Final Draft Staff Report concludes that while existing science is inadequate to support characterization of impacts that project specific GHG emissions have on global climatic change, the cumulative impact of all the projects is best addressed by requiring all projects subject to CEQA to reduce their GHG emissions through project design elements.

Since the adoption of the CCAP, SJVAPCD has published Best Performance Standards (BPS) for stationary sources and development projects, and guidance for valley land-use agencies in addressing GHG emissions for new projects under CEQA. However, the District has not published guidance related to large scale, long range planning projects such as General Plans.

Visalia Climate Action Plan

Visalia's draft 2013 CAP includes a baseline GHG emissions inventory of municipal and community emissions, identification and analysis of existing and proposed GHG reduction measures, and reduction targets to help Visalia work toward the State's goal of an 80 percent reduction below baseline emissions by 2050. The plan sets 2020 and 2030 reduction targets, and includes reduction actions for energy, transportation, and waste and resource conservation. The CAP includes targets and action steps for the municipal and community sectors. The CAP has been prepared concurrently with the proposed General Plan, is evaluated in this EIR together with the proposed General Plan, and includes objectives and specific policies from the proposed General Plan to address long-term emissions reduction efforts by the City.

Visalia's Climate Change Initiatives

In January 2007, Visalia's mayor signed the "Cool Cities" pledge, part of the U.S. Mayors Climate Protection Agreement. By entering into this agreement, the City has adopted the goal of reducing citywide GHG emissions to 7% below 1990 levels by 2012. As detailed in the CAP, this goal was subsequently expanded in response to ARB's recommended reduction target of 15% below the

2005 baseline, and the City added a 2030 mitigation target to correlate with the 2030 General Plan Update and the goal of achieving an 80% reduction by 2050.

In 2008, the City also became a partner with the San Joaquin Valley Clean Energy Organization (SJVCEO), which is a non-profit serving the eight county region. This partnership led to the development of the Valley Innovative Energy Watch (VIEW), which is a partnership with Southern California Edison (SCE), Southern California Gas Company (SoCalGas), Pacific Gas & Electric (PG&E), SJVCEO and other public jurisdictions in Kings/Tulare Counties. One major task in this initiative was assisting each of the local government partners to develop comprehensive clean energy/GHG reduction plans, including the identification of baseline GHG emissions and energy use.

Impact Analysis

SIGNIFICANCE CRITERIA

Implementation of the proposed Project would have a potentially significant adverse impact if it would:

Criterion 1: Result in a substantial increase in per service population (residents + jobs) energy consumption;

Criterion 2: Require a substantial increase in energy supply capacity or infrastructure, the construction of which could cause adverse environmental effects;

Criterion 3: Conflict with any existing local, regional, state or federal standards for energy production or efficiency;

Criterion 4: Conflict with existing local, regional, or state efforts to implement AB 32 or SB 375, specifically, result in the generation of GHG emissions, either directly or indirectly, in an amount greater than 6.6 $MTCO_2e$ per service population in the year 2020, or result in the generation of GHG emissions from passenger vehicles in an amount greater than 3.53 metric tons per capita by 2020.

Criterion 5: Result in buildout that would interfere with reasonable further progress towards post-2020 AB 32/SB375 targets. For the Plan buildout year of 2030, this equates to generation of GHG emissions, either directly or indirectly, in an amount greater than 3.8 $MTCO_2e$ per service population in the year 2030, or result in the generation of GHG emissions from passenger vehicles in an amount greater than 3.47 metric tons per capita by 2030.

The targets for total GHG emissions match the level of per service population emissions needed statewide to meet the goal of reducing total greenhouse gas emissions to 1990 levels by 2020 under the California Global Warming Solutions Act of 2006 (AB 32) and to 80 percent below 1990 levels by 2050 under Executive Order S-3-05, averaged for a 2030 target. As detailed in the CAP, the 2020 emissions goal was set in response to ARB's recommended reduction target of 15

percent below the 2005 baseline. The City added a 2030 mitigation to correlate with the goal of achieving an 80 percent reduction by 2050.

The target amounts for per capita emissions from passenger vehicles correspond to a 5 percent reduction per capita from 2005 levels by 2020 and an 8 percent reduction per capita by 2030, matching the target set for TCAG and other San Joaquin Valley metropolitan planning organizations under the Sustainable Communities and Climate Protection Act of 2008 (SB 375). These reflect statewide goals, set under SB 375. The reductions must be attributable to local or regional land use, housing, and transportation policies.

The target amounts for per capita emissions from passenger vehicles correspond to a 5 percent reduction per capita from 2005 levels by 2020 and an 8 percent reduction per capita by 2030, matching the target set for TCAG and other San Joaquin Valley metropolitan planning organizations under the Sustainable Communities and Climate Protection Act of 2008 (SB 375). These reflect statewide goals, set under SB 375. The reductions must be attributable to local or regional land use, housing, and transportation policies.

METHODOLOGY AND ASSUMPTIONS

Energy

This energy analysis focuses on the direct energy required to operate vehicles and to provide power to residential and non-residential buildings throughout the Planning Area. While energy is used in other ways in the City—including indirect uses associated with the construction and maintenance of buildings, vehicles, and other infrastructure—these other indirect sources are considered too speculative at the General Plan level to justify program EIR analysis. For purposes of this analysis, direct sources are considered reasonably comprehensive in scope and representative of the influence of the proposed Plan.

The energy analysis begins with existing conditions of non-transportation energy use in the City. Meter readings from SCE and SoCalGas obtained from the 2013 CAP were used to determine the consumption of electricity and natural gas for residential, commercial, and industrial uses. Government buildings are included in these numbers. The analysis then projects non-transportation energy use into the future using the Statewide Energy Efficiency Collaborative (SEEC) model. The SEEC model is a tool from the International Council for Environmental Initiatives (ICLEI), and is frequently used to determine energy use and CO_2e emissions for inventories and forecasts. The SEEC model incorporates the effect of statewide reduction measures on energy demand, but does not include the effect of emission reduction measures in the CAP on energy demand. Therefore, forecast energy use represents an overestimate of likely energy use.

For transportation energy use, the analysis is based on Caltrans estimates and the CAP calculations of the annual vehicle miles traveled (VMT) in 2005. VMT was assumed to increase at a rate of 1.33 percent, following California Energy Commission transportation energy forecasts.[19]

[19] California Energy Commission. Transportation Energy Forecasts for the 2007 Integrated Energy Policy Report. September 2007. http://www.energy.ca.gov/2007publications/CEC-600-2007-009/CEC-600-2007-009-SF.PDF. Table 4 page 12.

Fuel efficiency rates were assumed to be average fuel efficiency for 2005, and projected fuel efficiencies in 2030 are based on implementation of Pavley efficiency standards.

Greenhouse Gases

Visalia's draft CAP provided the basis for the greenhouse gas analysis, including an inventory of citywide GHG emissions in 2005 and forecasts of citywide GHG emissions in 2020 and 2030. ICLEI's Clean Air & Climate Protection (CACP) software package was used for much of the GHG emissions inventory. ICLEI's Climate and Air Pollution Planning Assistant (CAPPA) was utilized for many of the identified measures to calculate estimated emissions. A business-as-usual scenario was calculated first, as well as the effect of select State measures and existing and proposed emissions reduction measures.

The forecast emissions for 2020 and 2030 were then compared to total emissions targets set under AB 32 and Executive Order S-3-05.

IMPACT SUMMARY

Direct Energy Use

Implementation of the proposed Plan, combined with anticipated regional growth, will result in a large increase in residential, industrial and commercial (non-transportation) energy use; however, since the service population will more than double, per capita non-transportation energy use will decrease overall, reflecting the implementation of federal and statewide energy efficiency measures. Due to the increase in vehicle efficiency, transportation energy will increase proportionately less than the increase in VMT, and per capita transportation energy use will decrease substantially. CAP measures would further reduce energy use, however; these are not reflected in the estimation of energy use. The overall conclusion is that the impact of the proposed Plan on per service population energy use is less than significant.

Greenhouse Gas Emissions

The rate of greenhouse gas emissions under proposed Plan buildout is estimated to be approximately 1.82 metric tons carbon dioxide equivalent ($MTCO_2e$) per service population, including the effect of federal and statewide reduction measures in addition to CAP GHG reduction measures. This is much less than baseline conditions (5.86 $MTCO_2e$), and less than the target set under AB 32 and Executive Order S-3-05. Transportation GHG emissions are estimated to also decrease, from baseline conditions of 3.23 $MTCO_2e$ to buildout emissions of 0.81 $MTCO_2e$ per service population. Therefore, the impact of the proposed Plan on greenhouse gas emissions is less than significant.

Energy Infrastructure Capacity

While overall energy use (excluding the effect of emissions reductions measures) in Visalia is expected to approximately double, as the service population is expected to more than double, per capita energy consumption is expected to decline. Since SCE provides electricity for approximately 14 million people, and SoCalGas provides natural gas for approximately 20 million people, and both utilities are actively expanding their supply and provision network, this impact is less than significant.

Policy Consistency for New Development

As new individual development projects must meet California's Title 24 energy efficiency requirements, new development that may occur under the proposed General Plan will not result in wasteful, inefficient, or unnecessary consumption of energy. This impact is not analyzed further in this EIR.

Proposed Project Impact	*Mitigation Measure*	*Significance after Mitigation*
Implementation of the proposed Plan could result in a substantial increase in per service population (residents + jobs) energy consumption.	None required	Less than significant
Implementation of the proposed Plan could require a substantial increase in energy supply capacity or infrastructure, the construction of which could cause adverse environmental effects.	None required	Less than significant
Implementation of the proposed Plan could conflict with existing local, regional, or state efforts to implement AB 32 or SB 37, specifically, result in the generation of GHG emissions, either directly or indirectly, in an amount greater than 6.6 $MTCO_2e$ per service population in the year 2020, or result in the generation of GHG emissions from passenger vehicles in an amount greater than 3.53 metric tons per capita by 2020.	None required	Less than significant
Implementation of the proposed Plan could result in buildout that would interfere with reasonable further progress towards post-2020 AB 32/SB375 targets. For the Plan buildout year of 2030, this equates to generation of GHG emissions, either directly or indirectly, in an amount greater than 3.8 $MTCO_2e$ per service population in the year 2030, or result in the generation of GHG emissions from passenger vehicles in an amount greater than 3.47 metric tons per capita by 2030	None required	Less than significant

IMPACTS AND MITIGATION MEASURES

Impact

3.4-1 Implementation of the proposed Plan could result in a substantial increase in per service population (residents + jobs) energy consumption. (*Less than Significant*)

Residential, industrial and commercial (non-transportation) energy use for baseline population and General Plan buildout are shown in **Table 3.4-2**. While the total energy use is expected to nearly double, the service population will more than double. Therefore, energy use is projected to decrease from 36.9 MMBtu to 35.4 MMBtu per service population.

Table 3.4-2: Non-Transportation Energy Use in Visalia by Type, 2005-2030 (MMBtu)

Sector	*Baseline (2005)*	*General Plan Buildout (2030)*
Natural Gas	3,103,576	6,041,203
Electricity	2,612,311	5,084,941
Total Energy Use	**5,715,886**	**11,126,144**[1]
Population	107,281	209,600
Jobs	47,461[2]	104,550
Service Population (Population +Jobs)	154,742	314,150
Energy Use Per Service Population	**36.9**	**35.4**

1. Energy use estimated based on SEEC model forecast incorporating only state reductions and no additional emission reduction measures

2. Jobs estimated based on growth rate between 2005 and 2008 populations

Sources: Dyett & Bhatia Existing Conditions Report, 2010; Dyett & Bhatia, 2013; City of Visalia Climate Action Plan, 2013.

While VMT is projected to increase approximately 40 percent from baseline conditions to General Plan buildout, due to increases in both fuel efficiency and the service population, per service population transportation energy use will decrease substantially from 25.9 MMBtu to 11.2 MMBtu (**Table 3.4-3**). As shown in **Table 3.4-4**, per service population energy use is expected to decrease from 62.8 MMBtu to 46.7 MMBtu. As the estimation of energy use does not incorporate expected reductions from existing and proposed emissions reduction measures in the CAP, actual energy use is likely to be lower, which would decrease per service population energy use further. This impact is less than significant.

Table 3.4-3: Transportation Energy Use in Visalia, 2005-2030 (MMBtu)

	Annual VMT Generated	*Annual Gallons of Fuel Used*	*Aggregate Annual MMBtu*	*Annual MMBtu per Service Population*
2005 Baseline	672,149,689	32,007,128	4,000,891	25.9
2030 General Plan Buildout	935,227,069	28,254,594	3,531,824	11.2

1. Fuel efficiency used for baseline is 21.0 mpg, consistent with 2005 average fuel economy, while the fuel efficiency used for 2030 is 33.1, based on implementation of Pavley rules.

2. 1gallon of gasoline = 125,000 btu (or 0.125 MMBtu), while 1 gallon of diesel = 138,700 btu (or 0.138 MMBtu)

Sources: City of Visalia Climate Action Plan, 2013; USDOE, Transportation Energy Data Book, 27th ed.; Table B.4; Dyett & Bhatia, 2013.

Table 3.4-4: Total Energy Use in Visalia, 2005-2030 (MMBtu)

	Baseline (2005)		*General Plan Buildout (2030)*	
	Aggregate Annual MMBtu	*Annual MMBtu per Service Population*	*Aggregate Annual MMBtu*	*Annual MMBtu per Service Population*
Non-Transportation Subtotal	5,715,886	36.9	11,126,144	35.4
Transportation Subtotal	4,000,891	25.9	3,531,824	11.2
Total Energy Use	9,716,777	62.8	14,657,968	46.7

Source: Dyett & Bhatia, 2013.

Proposed General Plan Policies that Reduce the Impact

T-P-20 Work with major employers and the Tulare County Association of Governments (TCAG) to reduce total vehicle miles traveled and the total number of daily and peak hour vehicle trips and provide better utilization of the transportation system through development and implementation of Transportation Demand Management (TDM) strategies that are tailored to the needs of geographic areas within the City and the time period of traffic congestion.

These may include the implementation staggered work hours, utilization of telecommunications, increased use of ridesharing in the public and private sectors, and provision for bicyclists.

T-P-41 Integrate the bicycle transportation system into new development and infill redevelopment. Development shall provide short term bicycle parking and long term bicycle storage facilities, such as bicycle racks, stocks, and rental bicycle lockers. Development also shall provide safe and convenient bicycle and pedestrian access to high activity land uses such as schools, parks, shopping, employment, and entertainment centers.

T-P-53 Develop flexible parking requirements in the zoning ordinance for development proposals based on "best practices" and the proven potential to reduce parking demand.

These could include projects that integrate transit facilities, incorporate a mix of uses with differing peak parking demand periods (e.g., residential and office), incorporate shared parking or common area parking, or incorporate other Transportation Demand Management (TDM) Strategies for residents or tenants (car-sharing, requiring paid parking, etc.).

T-P-67 Participate in the planning process for a potential Cross Valley Rail Line, which could provide east-west light rail service from Visalia to Huron and potentially connect to a future High Speed Rail system.

T-P-77 Work with TCAG to ensure that the Regional Transportation Plan (RTP) and Sustainable Communities Strategy are consistent with Visalia's Land Use and Transportation policies.

AQ-P-13 Promote and expand the trip-reduction program for City employees to reduce air pollution and emissions of greenhouse gas.

The program may include carpooling and ridesharing; reimbursement of transit costs; encouragement of flexible work schedules, telecommuting, and teleconferencing.

Mitigation Measures

None required.

Impact

3.4-2 Implementation of the proposed Plan could require a substantial increase in energy supply capacity or infrastructure, the construction of which could cause adverse environmental effects. (*Less than Significant*)

Residential, industrial, and commercial (non-transportation) energy use is projected to approximately double from baseline (2005) conditions to the proposed General Plan buildout in 2030, excluding the effect of emissions reductions measures on energy demand. Since the service population is projected to more than double, non-transportation energy use per service population will decrease slightly, from 36.9 MMBtu per person to 35.4 MMBtu per person.

SCE currently supplies approximately 14 million people across Southern California and the Central Valley. SoCalGas currently provides natural gas for approximately 20 million people. Visalia's 2030 projected service population of 314,150 represents a small fraction of the total population served; about 2 percent of SCE's and 1.5 percent of SoCalGas' current service population.

Both SCE and SoCalGas are constructing and planning projects to increase their supply and distribution network to meet projected demand throughout their service areas. SCE is currently constructing the San Joaquin Cross Valley Loop Project in Tulare County to maintain reliable electricity service and serve forecast electrical demand.[20] SoCalGas has developed a system expansion study of storage facilities, including the Honor Rancho storage field closest to Visalia.[21] Both utilities consistently monitor and evaluate the need for service for new customers and will propose and implement projects based on demand forecasts and need.

In addition to these planned service expansions by SCE and SoCalGas, the proposed Plan includes numerous new policies that aim to reduce non-transportation energy use. Despite the increase in population and energy use, per service population energy use will decline. Therefore, this impact is less than significant.

[20] California Public Utilities Commission. 2010. Available: http://www.cpuc.ca.gov/Environment/info/esa/sjxvl/index.html

[21] Southern California Gas Company. 2011. Available: http://www.socalgas.com/regulatory/documents/StorageExpansionStudy2011.pdf

Mitigation Measures

None required.

Impact

3.4-3 Implementation of the proposed Plan could conflict with existing local, regional, or state efforts to implement AB 32 or SB 375, specifically, result in the generation of GHG emissions, either directly or indirectly, in an amount greater than 6.6 $MTCO_2e$ per service population in the year 2020, or result in the generation of GHG emissions from passenger vehicles in an amount greater than 3.53 metric tons per capita by 2020. (*Less than Significant*)

Community-wide GHG emissions—in the transportation, commercial/industrial, residential, and solid waste sectors—are forecast to decrease in each sector from 2005 to 2020, from total emissions of 906,337 $MTCO_2e$ to 767,597 $MTCO_2e$ (**Table 3.4-5**), with the incorporation of the CAP emissions reductions measures. The City's CAP has been prepared concurrently with the proposed General Plan. The CAP contains an inventory of citywide and municipal GHG emissions; forecasts of future citywide and municipal GHG emissions; and proposed actions to demonstrate the City's commitment to achieve state GHG reduction targets. The CAP also includes actions directly related proposed Plan's goal and policies, such as the GHG reduction effect of transportation and land use policies. Additional proposed CAP emissions reductions measures include the effect of existing and proposed measures to reduce energy use, improve water use efficiency, provide alternative transportation options, and reduce waste.[22] Implementation of the CAP would occur concurrently with the General Plan. **Table 3.4-6** shows a summary of Visalia's proposed community GHG reduction measures through 2030. The implementation of city policies delineated in the proposed General Plan, and concurrent implementation of the measures in the CAP, would provide GHG reductions to meet the City's targets, which are directly based on those set forth in AB 32.

Table 3.4-7 shows that per service population transportation emissions are projected to drop from 3.23 $MTCO_2e$ to 1.67 $MTCO_2e$ per service population from 2005 to 2020. The 2020 transportation emissions are less than the threshold of 3.53 metric tons per capita. **Table 3.4-8** demonstrates that the 2020 community emissions of 3.06 $MTCO_2e$ per service population are less than the target of 6.6 metric tons per capita. Since the community-wide and passenger vehicle projections meet the 2020 thresholds, this impact is less than significant.

[22] See Table 7: Summary of Visalia's Existing Community Measures and Table 9: Summary of Visalia's Proposed Community Measures through 2030 in the City of Visalia Climate Action Plan for description and quantification of emissions reductions measures.

Table 3.4-5: GHG Emissions By Sector with Proposed Emission Reduction Measures, 2005-2030 ($MTCO_2e$)

Year	*Transportation*	*Commercial/ Industrial*	*Residential*	*Solid Waste*	***Total***
2005	500,112	210,634	202,453	-7,862	906,337
2020	417,748	164,974	194,102	-9,226	767,597
2030	255,404	138,798	188,668	-9,604	573,266

Sources: City of Visalia Climate Action Plan, 2013; Dyett & Bhatia, 2013.

Table 3.4-6: Summary of Visalia's Draft CAP Proposed Community Measures through 2030

Action Category	*Proposed Actions*	*2020 Potential Emissions Reduction* ($MTCO_2e$)	*2030 Potential Emissions Reduction* ($MTCO_2e$)
Energy	1. ENERGY STAR Appliances & Equipment:	4,226	5,463
	2. Community-wide Solar PV Bulk Purchasing	142	184
	3. Property Assessed Clean Energy (PACE) Program	21,951	52,942
	4. Energy Efficiency Marketing & Programs	12,045	13,839
	5. Visalia Unified School District (VUSD) Solar Program.	2,260	2,260
Water and Resource Conservation	6. Water Efficient Landscaping Policy	1,520	1,965
	7. Water Efficient Landscaping Promotion and Education.	760	982
Transportation/Land Use	8. Transit Oriented Development	6,962	8,999
	9. Electric Vehicle promotion, including Plug-in Electric Vehicle (PEV) Charging Stations	7,940	33,707
	10. Local, Low-Carbon Transportation Education	2,569	3,321
	11. Infill and Higher Density Development	16,006	20,335
	12. CNG Public Fueling Stations	3,340	5,204
Waste and Resource Conservation	13. Anaerobic Digestion	9,991	11,959
Total		**89,712**	**161,160**

Table 3.4-7: Transportation GHG Emissions and Targets, 2005-2030 ($MTCO_2e$)

Year	Transportation Emissions	Per Service Population Transportation Emissions	GHG Transportation Target	Target Met?
2005	500,112	3.23	-	-
2020	417,748	1.67	3.53	Yes
2030	255,404	0.81	3.47	Yes

Sources: City of Visalia Climate Action Plan, 2013; Dyett & Bhatia, 2013.

Table 3.4-8: Community GHG Emissions and Targets, 2005-2030 ($MTCO_2e$)

Year	Community Emissions	Per Service Population Emissions	GHG Targets	Target Met?
2005	906,337	5.86	-	-
2020	767,597	3.06	6.6	Yes
2030	573,266	1.82	3.8	Yes

Sources: City of Visalia Climate Action Plan, 2013; Dyett & Bhatia, 2013.

Proposed General Plan Policies that Reduce the Impact in Addition to CAP Measures

A-P-12 Where feasible, replace City vehicles with those that employ low-emission technology.

A-P-13 Promote and expand the trip-reduction program for City employees to reduce air pollution and emissions of greenhouse gas.

The program may include carpooling and ridesharing; reimbursement of transit costs; encouragement of flexible work schedules, telecommuting, and teleconferencing.

A-P-14 Maintain an inventory of greenhouse gas emissions from City operations and track related solid waste, energy, economic, and environmental data. Update the inventory periodically as additional data and methodologies become available.

A-P-15 Support State efforts to reduce greenhouse gases and emissions through local action that will reduce motor vehicle use, support alternative forms of transportation, require energy conservation in new construction, and energy management in public buildings, in compliance with AB 32.

By proposing compact development, mixed use centers, walkable neighborhoods, green building technology, and jobs-housing balance, the City will be helping to

implement many of the strategies and programs in the San Joaquin Valley 2007 Ozone Plan.

A-P-16 Prepare and adopt a Climate Action Plan that incorporates a Greenhouse Gas (GHG) Emissions Reduction Plan. The GHG Emissions Reduction Plan will quantify current and anticipated future emissions and focus on feasible actions the City can take to minimize the adverse impacts of General Plan implementation on climate change and air quality.

Mitigation Measures

None required.

Impact

3.4-4 Implementation of the proposed Plan could result in buildout that would interfere with reasonable further progress towards post-2020 AB 32/SB 375 targets. For the Plan buildout year of 2030, this equates to generation of GHG emissions, either directly or indirectly, in an amount greater than 3.8 $MTCO_2e$ per service population in the year 2030, or result in the generation of GHG emissions from passenger vehicles in an amount greater than 3.47 metric tons per capita by 2030. (*Less than Significant*)

The 2030 forecast transportation and community-wide emissions are shown in **Tables 3.4-6** and **3.4-7** respectively. There is a 75 percent decrease in transportation emissions per service population from 2005 to 2030, and a 69 percent decrease in community-wide emissions per service population from 2005 to 2030. The 2030 per service population transportation emissions of 0.81 $MTCO_2e$ is well below the target of 3.47 $MTCO_2e$ and the community emissions of 1.82 $MTCO_2e$ are much less than the target of 3.8 $MTCO_2e$. Therefore, this impact is less than significant.

Proposed General Plan Policies that Reduce the Impact in Addition to CAP Measures

See policies listed above in Impact 3.4-4.

Mitigation Measures

None required.