

ENERGY IMPACT ANALYSIS

FOR

CITY OF FOWLER GENERAL PLAN UPDATE

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LIST OF COMMON TERMS & ACRONYMS

AFV	Alternative Fuel Vehicles
CalEEMod	California Emissions Estimator Model
CARB	California Air Resource Board
CEC	California Energy Commission
CEQA	California Environmental Quality Act
EMFAC	Emissions Factor
EO	Executive Order
EPA	Environmental Protection Agency
EPACT	Energy Policy Act
FCOG	Fresno Council of Governments
GHG	Greenhouse Gas
GPU	General Plan Update
kBTU	Kilo British Thermal Units
kW	Kilowatt
kWh	Kilowatt Hour
MMBTU	Million Metric British Thermal Units
MW	Megawatt
PG&E	Pacific Gas and Electric
PV	Photovoltaic
RTP	Regional Transportation Plan
SCS	Sustainable Communities Strategy
SJVAPCD	San Joaquin Valley Air Pollution Control District
VMT	Vehicle Mile Travelled

INTRODUCTION

This report provides a summary of important laws, regulations, and guidance documents relevant to air quality and land use planning in California and Fowler; an overview of existing air quality issues and conditions; a description of local and regional air quality issues and programs; and a summary of findings. The findings from this analysis will inform the development of goals and policies in the City's General Plan Update (GPU).

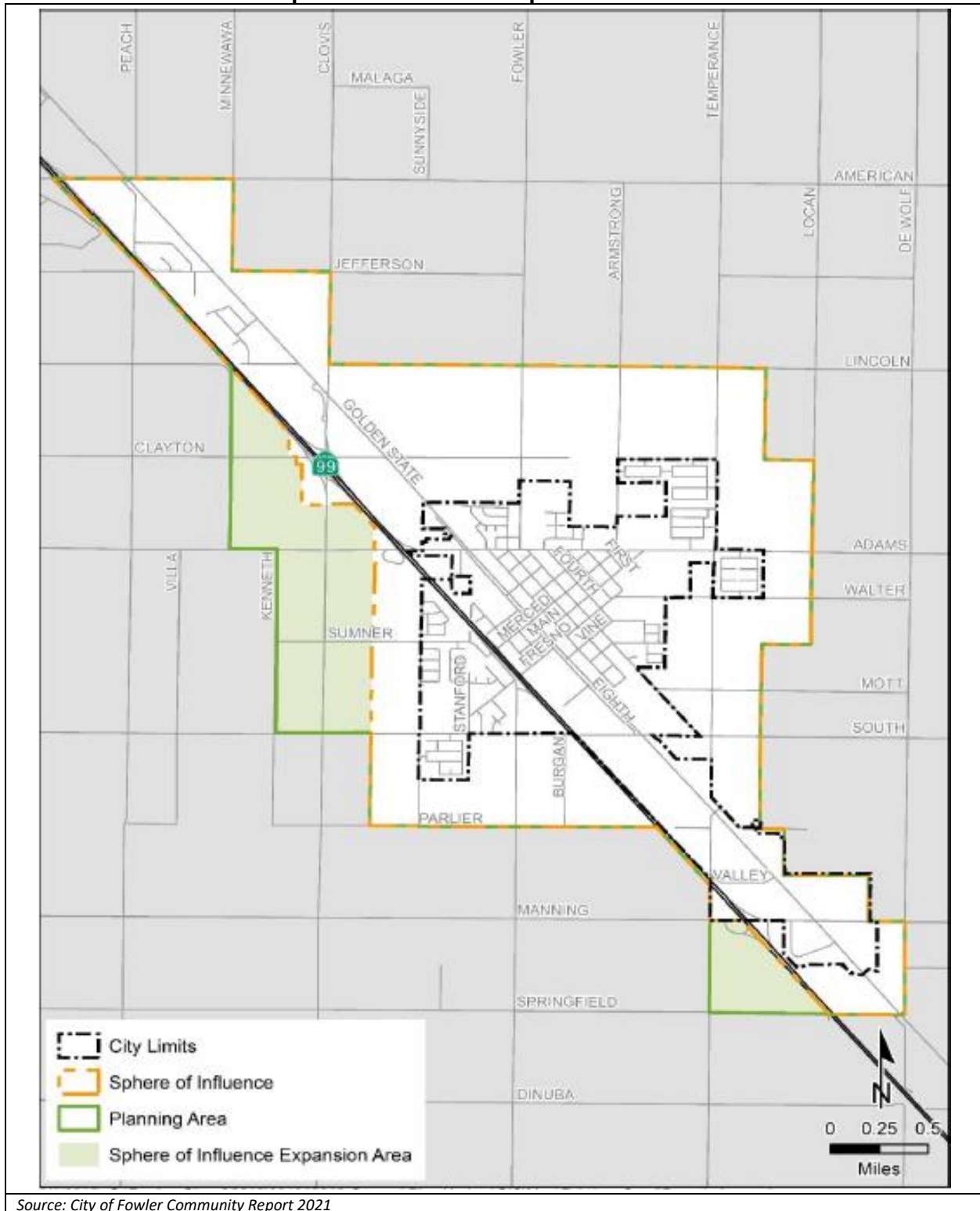
PROPOSED CITY OF FOWLER GENERAL PLAN UPDATE

The City of Fowler adopted its first General Plan in 1976. The currently adopted General Plan was adopted in June 2004 and runs through 2025. Since its adoption, the General Plan has been revised and amended but has not been comprehensively updated. The proposed GPU will include updates to represent changes in community conditions, new legislation, new regulatory requirements and planning practices, and updates regarding new social and environmental issues. The GPU will be updated to provide a planning horizon year 2042. The City of Fowler's city limits, sphere of influence, and planning area is depicted in Figure 1.

ENERGY FUNDAMENTALS

Energy use is typically associated with transportation, construction, and the operation of land uses. Transportation energy use is generally categorized as direct and indirect energy. Direct energy relates to energy consumption by vehicle propulsion. Indirect energy relates to the long-term energy consumption of equipment, such as maintenance activities. Energy is also consumed by construction, routine operation and, maintenance of land use. Construction energy relates to a direct one-time energy expenditure primarily associated with the consumption of fuel to operate construction equipment. Energy consumption related to land use is normally associated with direct energy consumption for heating, ventilation, and air conditioning of buildings.

**Figure 1
Proposed General Plan Update Focus Areas**



EXISTING SETTING

Physical Setting

The city of Fowler is located in Fresno County. The city is served primarily by Pacific Gas & Electric (PG&E). The climate in the project area is semi-arid, with an annual normal precipitation of approximately 11 inches. Temperatures in the project area range from an average minimum of approximately 38 degrees Fahrenheit (°F), in January, to an average maximum of 98°F, in July (WRCC 2022).

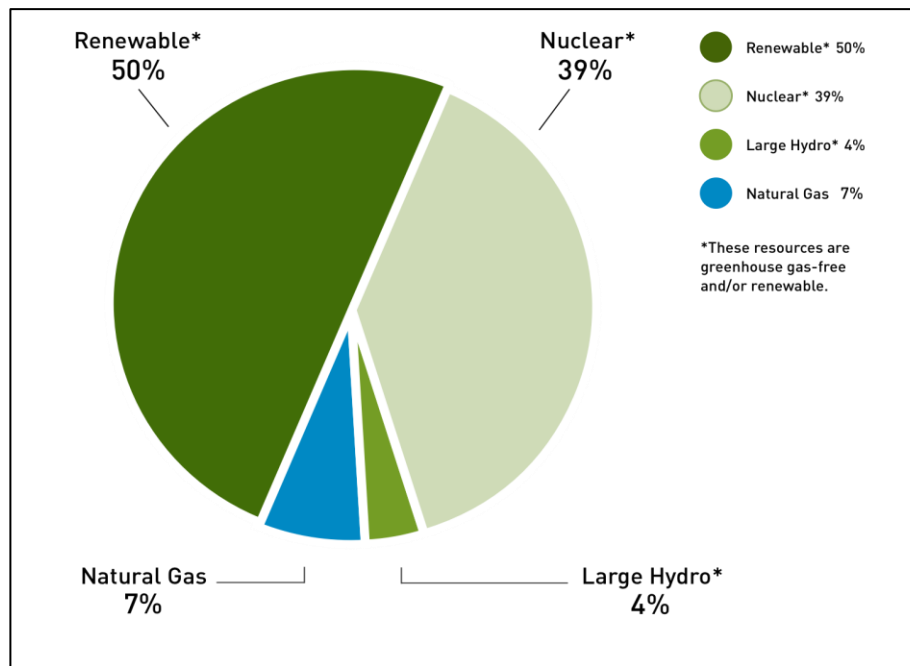
Energy Resources

Energy sources for the City of Fowler are served primarily by PG&E. Energy resources consist largely of natural gas, nuclear, fossil fuels, hydropower, solar, and wind. The primary use of energy sources is for electricity to operate campus facilities.

Electricity

Electric services within Fowler are provided by the regulated electric utility, PG&E. The breakdown of PG&E’s power mix is shown in Figure 2. As shown, 97 percent of PG&E’s 2021 total electric power mix came from greenhouse gas (GHG)-free sources that include nuclear, large hydro, renewable energy sources, and natural gas (PG&E 2021).

Figure 2. PG&E 2021 Power Mix



Source: PG&E 2021

Natural Gas

Natural gas services in the City of Fowler are purchased from Southern California Gas Company (SoCalGas). SoCalGas's natural gas system encompasses approximately 20,000 square miles in Southern California (SoCalGas 2020). Natural gas throughput provided by SoCalGas totals approximately 2.8 billion cubic feet per day (SoCalGas 2013).

REGULATORY FRAMEWORK

Federal

Regulations for Greenhouse Gas Emissions from Passenger Cars and Trucks and Corporate Average Fuel Economy Standards

In October 2012, the United States Environmental Protection Agency (U.S. EPA) and National Highway Traffic Safety Administration (NHTSA), on behalf of the United States Department of Transportation (U.S. DOT), issued final rules to further reduce greenhouse gas (GHG) emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond. NHTSA's CAFE standards have been enacted under the Energy Policy and Conservation Act since 1978. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program would increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) limiting vehicle emissions to 163 grams of carbon dioxide (CO₂) per mile for the fleet of cars and light-duty trucks by the model year 2025.

In January 2017, U.S. EPA Administrator Gina McCarthy signed a Final Determination to maintain the current GHG emissions standards for the model year 2022-2025 vehicles. However, on March 15, 2017, U.S. EPA Administrator Scott Pruitt and U.S. DOT Secretary Elaine Chao announced that U.S. EPA intends to reconsider the Final Determination. On April 2, 2018, U.S. EPA Administrator Scott Pruitt officially withdrew the January 2017 Final Determination, citing information that suggests that these current standards may be too stringent due to changes in key assumptions since the January 2017 Determination. According to the U.S. EPA, these key assumptions include gasoline prices and overly optimistic consumer acceptance of advanced technology vehicles. The April 2, 2018, notice is not U.S. EPA's final agency action. The U.S. EPA intends to initiate rulemaking to adopt new standards. Until that rulemaking has been completed, the current standards remain in effect. (U.S. EPA 2017, U.S. EPA 2018).

Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the United States would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the NHTSA, which is part of the U.S. DOT, is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 miles per gallon (mpg). Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined based on each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The CAFE program, administered by U.S. EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. U.S. EPA calculates a CAFE value for each

manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the U.S. DOT is authorized to assess penalties for noncompliance.

Energy Policy Act of 1992

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 included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

Energy Policy Act of 2005

The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the Act provides 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.

State

Warren-Alquist Act

The 1975 Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as the California Energy Commission (CEC). The Act established a state policy to reduce wasteful, uneconomical, and unnecessary uses of energy by employing a range of measures. The California Public Utilities Commission (CPUC) regulates privately-owned utilities in the energy, rail, telecommunications, and water fields.

Assembly Bill 32: Climate Change Scoping Plan and Update

In October 2008, ARB published its Climate Change Proposed Scoping Plan, which is the State's plan to achieve GHG reductions in California as required by AB 32. This initial Scoping Plan contained the main strategies to be implemented to achieve the target emission levels identified in AB 32. The Scoping Plan included ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations were associated with improving emissions standards for light-duty vehicles, implementing the Low Carbon Fuel Standard program, implementation of energy efficiency measures in buildings and appliances, the widespread development of combined heat and power systems, and developing a renewable portfolio standard for electricity production.

The initial Scoping Plan was first approved by California Air Resources Board (ARB) on December 11, 2008, and is updated every five years. The first update of the Scoping Plan was approved by the ARB on May 22, 2014, which looked past 2020 to set mid-term goals (2030-2035) on the road to reaching the 2050 goals (ARB 2014). The most recent update released by the ARB is the 2017 Climate Change Scoping Plan, which was released in November 2017. The measures identified in the 2017 Climate Change Scoping Plan have the co-benefit of increasing energy efficiency and reducing California's dependency on fossil fuels.

Assembly Bill 1007: State Alternative Fuels Plan

AB 1007 (Chapter 371, Statutes of 2005) required CEC to prepare a state plan to increase the use of alternative fuels in California. CEC prepared the State Alternative Fuels (SAF) Plan in partnership with ARB and consultation with other state, federal, and local agencies. The SAF Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes the costs to California and maximizes the economic benefits of in-state production. The SAF Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuel use, reduce GHG emissions, and increase in-state production of biofuels without causing significant degradation of public health and environmental quality.

Assembly Bill 2076: Reducing Dependence on Petroleum

Pursuant to Assembly Bill (AB) 2076 (Chapter 936, Statutes of 2000), the CEC and the ARB prepared and adopted a joint agency report in 2003, 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 vehicle miles traveled (VMT) (ARB 2003). Further, a performance-based goal of AB 2076 was to reduce petroleum demand to 15 percent below 2003 demand by 2020.

Senate Bill SB 100

SB 100 The 100 Percent Clean Energy Act of 2018, which sets a state policy that eligible renewable energy and zero-carbon resources supply 100 percent (%) of all retail sales of electricity in California by 2045.

Senate Bill 350: Clean Energy and Pollution Prevention Reduction Act of 2015

The Clean Energy and Pollution Reduction Act of 2015 (SB 350) requires the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources to be increased to 50 percent by December 31, 2030. This act also requires a doubling of the energy efficiency savings in electricity and natural gas for retail customers through energy efficiency and conservation by December 31, 2030.

Senate Bill 375

SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will address land use allocation in that MPOs regional transportation plan (RTP). ARB, in consultation with MPOs, establishes regional reduction targets for GHGs emitted by passenger cars and light trucks for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, funding for transportation projects may be withheld.

Senate Bill 1078: California Renewables Portfolio Standard Program

Senate Bill (SB) 1078 (Public Utilities Code Sections 387, 390.1, 399.25, and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum of 20 percent of their supply from renewable sources by 2017. This SB will affect statewide GHG emissions associated with electricity generation. In 2008, Governor

Schwarzenegger signed Executive Order (EO) S-14-08, which set the Renewables Portfolio Standard (RPS) target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target. EO S-14-08 was later superseded by EO S-21-09 on September 15, 2009. EO S-21-09 directed the ARB to adopt regulations requiring 33 percent of electricity sold in the State to come from renewable energy by 2020. Statute SB X1-2 superseded this EO in 2011, which obligated all California electricity providers, including investor-owned utilities and publicly owned utilities, to obtain at least 33 percent of their energy from renewable electrical generation facilities by 2020.

Senate Bill 32 and Assembly Bill 197 of 2016

SB 32 was signed by Governor Brown on September 8, 2016. SB 32 effectively extends California's GHG emission-reduction goals from the year 2020 to the year 2030. This new emission-reduction target of 40 percent below 1990 levels by 2030 is intended to promote further GHG reductions in support of the State's ultimate goal of reducing GHG emissions by 80 percent below 1990 levels by 2050. SB 32 also directs the ARB to update the Climate Change Scoping Plan to address this interim 2030 emission-reduction target. Achievement of these goals will have the co-benefit of increasing energy efficiency and reducing California's dependency on fossil fuels.

Executive Order S-06-06

EO S-06-06, signed on April 25, 2006, establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The EO establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The EO also calls for the State to meet a target for use of biomass electricity. The Bioenergy Action Plans developed by the CEC to identify those barriers and recommend actions to address them so that the State can meet its clean energy, waste reduction, and climate protection goals. The 2012 Bioenergy Action Plan provides a detailed action plan to achieve the following goals:

- increase environmentally- and economically-sustainable energy production from organic waste;
- encourage the development of diverse bioenergy technologies that increase local electricity generation, combined heat and power facilities, renewable natural gas, and renewable liquid fuels for transportation and fuel cell applications;
- create jobs and stimulate economic development, especially in rural regions of the state; and
- reduce fire danger, improve air and water quality, and reduce waste.

In 2019, 2.87 percent of the total electrical system power in California was derived from biomass (CEC 2020).

Executive Order B-48-18: Zero-Emission Vehicles

In January 2018, Governor Brown signed EO B-48-18 which required all State entities to work with the private sector to put at least 5 million zero-emission vehicles on the road by 2030, as well as install 200 hydrogen fueling stations and 250,000 zero-emissions chargers by 2025. In addition, State entities are also required to continue to partner with local and regional governments to streamline the installation of zero-

emission vehicle infrastructure. Additionally, all State entities are to support and recommend policies and actions to expand infrastructure in homes, through the Low-Carbon Fuel Standard.

Executive Order B-55-18

Establishes a new statewide goal “to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter.

Energy Action Plan

The first Energy Action Plan (EAP) emerged in 2003 from a crisis atmosphere in California’s energy markets. The State’s three major energy policy agencies (CEC, CPUC, and the Consumer Power and Conservation Financing Authority [established under deregulation and now defunct]) came together to develop one high-level, coherent approach to meeting California’s electricity and natural gas needs. It was the first time that energy policy agencies formally collaborated to define a common vision and set of strategies to address California’s future energy needs and emphasize the importance of the impacts of energy policy on the California environment.

In the October 2005 EAP II, CEC and CPUC updated their energy policy vision by adding some important dimensions to the policy areas included in the original EAP, such as the emerging importance of climate change, transportation-related energy issues, and research and development activities. The CEC adopted an update to the EAP II in February 2008 that supplements the earlier EAPs and examines the State’s ongoing actions in the context of global climate change.

California Building Code

The California Building Code (CBC) contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvements to real property. The CBC is adopted every three years by the Building Standards Commission (BSC). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if it makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

Green Building Standards

In essence, green building standards are indistinguishable from any other building standards, are contained in the CBC, and regulate the construction of new buildings and improvements. Whereas the focus of traditional building standards has been protecting public health and safety, the focus of green building standards is to improve environmental performance.

The 2019 Building Energy Efficiency Standards (2019 Standards), adopted in May 2018, addressed four key areas: smart residential photovoltaic systems, updated thermal envelope standards (preventing heat transfer from the interior to the exterior and vice versa), residential and nonresidential ventilation requirements, and non-residential lighting requirements. The 2019 Standards required new residential and non-residential construction; as well as major alterations to existing structures, to include electric vehicle (EV)-capable parking spaces which have electrical panel capacity and conduit to accommodate the future installation. In addition, the 2019 Standards also required the installation of solar photovoltaic (PV) systems for low-rise residential dwellings, defined as single-family dwellings and multi-family dwellings up

to three stories in height. These requirements are based on various factors, including the floor area of the home, sun exposure, and climate zone. Under the 2019 standards, nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades (CEC 2018).

The recently updated 2022 Building Energy Efficiency Standards (2022 Standards), which were approved in December 2021, encourage efficient electric heat pumps, establish electric-ready requirements when natural gas is installed, support the future installation of battery storage, further expand solar photovoltaic and battery storage standards. The 2022 Standards extend solar PV system requirements, as well as battery storage capabilities for select land uses, including high-rise multi-family and non-residential land uses, such as office buildings, schools, restaurants, warehouses, theaters, grocery stores, and more. Depending on the land use and other factors, solar systems should be sized to meet targets of up to 60 percent of the structure's loads. These new solar requirements will become effective on January 1, 2023, and contribute to California's goal of reaching a net-zero carbon footprint by 2045 (CEC 2022).

Advanced Clean Cars Program

In January 2012, ARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of standards for vehicle model years 2017 through 2025. The new rules strengthen the GHG standard for 2017 models and beyond. This will be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's zero-emission vehicle regulation requires a battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the state. The number of stations will grow as vehicle manufacturers sell more fuel cell vehicles. By 2025, when the rules will be fully implemented, the statewide fleet of new cars and light trucks will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions than the statewide fleet in 2016 (ARB 2016).

Advanced Clean Cars II

In August 2022, ARB approved the Advanced Clean Cars II program. The rule establishes a year-by-year roadmap so that by 2035 100% of new cars and light trucks sold in California will be zero-emission vehicles, including plug-in hybrid electric vehicles. Beginning in model year 2026 automakers sales of new vehicles will be required to be made up of 35% ZEVs and PHEVs. The regulation applies to automakers and covers only new vehicle sales. It does not impact existing vehicles on the road today, which will still be legal to own and drive (ARB 2022).

Small Off-Road Engines

In December 2021, ARB approved the Small Off-Road Engines regulation. This will require most newly manufactured small off-road engines such as those found in leaf blowers, lawn mowers and other equipment be zero emission starting in 2024. Portable generators, including those in recreational vehicles, would be required to meet more stringent standards in 2024 and meet zero-emission standards starting in 2028. Despite their small size, these engines are highly polluting. The volume of smog-forming emissions from this type of equipment has surpassed emissions from light-duty passenger cars and is projected to be nearly twice those of passenger cars by 2031. Older equipment can continue to be used and resold as this rule only impacts new equipment (ARB 2021).

Fresno County Regional Transportation Plan

The Fresno Council of Governments (FCOGs) 2022 Regional Transportation Plan (RTP) comprehensively assesses all forms of transportation available in Fresno County, as well as travel and goods movement needs through 2042. FCOG's first RTP was adopted in 1975. Updated editions have been published every four years per federal statutes refinements of the original and subsequent plans, making this the 19th edition. Federal and state legislation mandates that these long-range transportation plans extend at least 20 years into the future. As the federally designated MPO and state-designated Regional Transportation Planning Agency, FCOG has developed the 2022 RTP update through a continuous, comprehensive, and cooperative framework. This process has involved the region's 15 cities, the County of Fresno, staff from related local public agencies, the San Joaquin Valley Air Pollution Control District (SJVAPCD), Caltrans, other state and federal agencies, and the public. The RTP is made up of a variety of different elements or chapters, and each element is augmented by additional documentation. The RTP also contains a chapter that establishes the SCS to show how integrated land use and transportation planning can lead to more efficient use of autos and light trucks, as well as improve the overall quality of life in the region.

Rule 4901

On June 20, 2019, the SJVAPCD adopted and amendments to Rule 4901 to reduce the public's exposure to harmful particulates from wood smoke. Residential wood burning is one of the largest sources of PM^{2.5} in the San Joaquin Valley during the winter season. Under the rule installation of new wood burning fireplaces and heaters is restricted at elevations below 3,000 ft. The rule also requires any modifications made to an existing fireplace or chimney must install an EPA certified, gas fueled or electric device (SJVAPCD 2021).

ENVIRONMENTAL IMPACTS

SIGNIFICANCE THRESHOLD CRITERIA

According to Appendix G of the California Environmental Quality Act (CEQA) Guidelines, a project would normally have a significant effect on the environment if the project would:

- E-1: Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.
- E-2: Conflict or obstruct a state or local plan for renewable energy or energy efficiency.

The CEQA Guidelines, Appendix F, require environmental analyses to include a discussion of potential energy impacts associated with a proposed project. Where necessary, CEQA requires that mitigation measures be incorporated to reduce the inefficient, wasteful, or unnecessary consumption of energy. The State CEQA Guidelines, however, do not establish criteria that define inefficient, wasteful, or unnecessary consumption. Compliance with the State's building standards for energy efficiency would result in decreased energy consumption for proposed buildings. However, compliance with building codes may not adequately address all potential energy impacts associated with project construction and operation. As a result, this analysis includes an evaluation of electricity and natural gas usage requirements associated with future development, as well as energy requirements associated with the use of on-road and off-road vehicles. The degree to which the proposed project would comply with existing energy standards, as well as applicable regulatory requirements and policies related to energy conservation was also taken into consideration for the evaluation of project-related energy impacts.

Methodology

Energy consumption is categorized in terms of "operational" and "construction" energy. Operational energy accounts for energy consumed mobile source and land use scenario envisioned under the 2042 GPU, such as fuel consumed by vehicles, natural gas consumed for heating and/or power, and electricity consumed for power. Construction energy is the energy needed for construction and maintenance of the transportation system and land use scenario facilitated by the 2042 GPU. The analysis of operational energy involves the quantification of anticipated transportation fuel, natural gas, and electricity consumption under the 2042 GPU and a qualitative discussion of the efficiency, necessity, and wastefulness of the energy consumption. Analysis of construction energy involves a qualitative discussion of construction and maintenance energy requirements anticipated under buildout of the 2042 GPU.

Construction

Development facilitated by the 2042 GPU would involve the use of energy during construction and operation. Energy use during construction would be primarily in the form of fuel consumption to operate heavy equipment, light-duty vehicles, machinery, and generators for lighting. Much of this information for specific future development projects is unknown at this time, and construction-related impacts were qualitatively discussed.

Operations

The long-term operation of the proposed 2042 GPU would require electricity usage for lighting, space and water heating, appliances, water conveyance, and landscaping maintenance equipment. Indirect energy use would include wastewater treatment and solid waste removal.

Projections for the 2042 GPU transportation fuel were calculated based on the VMT Impact Assessment conducted by Kittelson & Associates and ARB’s Emission Factors 2021 (EMFAC2021) database. For 2042 natural gas and electricity consumption under buildout of the land use scenario envisioned by the 2042 GPU, consumption factors were drawn from the California Emissions Estimator Model (CalEEMod) Version 2020.4.0. The CalEEMod data is provided in Appendix A.

Relevant Proposed GPU Goals and Policies

The 2042 GPU includes a number of goals and policies that would energy usage. Some of the most relevant of these goals and policies include the following:

- H-6.1** Encourage the use of energy conserving techniques in the siting and design of new housing.
- H-6.2** Actively implement and enforce all State energy conserving requirements for new residential construction.
- H-6.3** Promote Public awareness of the need for energy conservation.
- LU-21** Encourage large, employment-generating developments to provide services such as cafeterias, childcare, and business support services that reduce the need for vehicle trips. (Land Use Element, Policy 4.6.5)
- CH-6** Evaluate land use decisions for consistency with siting recommendations as outlined in the ARB’s Land Use Compatibility Handbook.
- MOB-4** Support the creation of a transportation network that provides for efficient movement of people and goods while accounting for environmental effects.
- MOB-9** New development may be required to provide off-site pedestrian and/or bicycle facilities to address gaps in the active transportation network.
- MOB-10** Develop a multi-purpose recreational bikeway network and support facilities.
- MOB-11** Ensure street and road projects are adequately designed to accommodate safe and convenient pedestrian and bicyclist access.
- MOB-12** Require traffic calming techniques in the design of new local streets where such techniques will manage traffic flow and improve safety for pedestrian and bicyclist users.
- MOB-13** Coordinate with Caltrans, FCOG, FCRTA, and other responsible agencies to identify the need for additional mobility infrastructure and/or services along major commuter travel corridors.
- MOB-14** Identify opportunities for a multi-modal transit hub within the City.
- MOB-15** Support the development of paratransit service programs.
- MOB-16** Support transit operator efforts to maximize return for short- and long-range transit needs.
- MOB-17** Incorporate the potential for public transit service expansion throughout the City.
- MOB-18** Improve route options and access for public transit City-wide, specifically west of SR 99.

IMPACTS AND MITIGATION MEASURES

Impact E-1: *Would the project result in the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?*

Implementation of the proposed project would increase electricity, diesel, gasoline, and natural gas consumption associated with construction activities, as well as long-term operational activities. The increases in energy consumption associated with short-term construction and long-term operational

activities would be efficiently used after implementation of the General Plan Policies. Therefore, the impact of the proposed plan would be **Less Than Significant**.

Construction-Related Energy Consumption

Energy consumption would occur during construction of the proposed 2042 GPU would including fuel use associated with the on-site operation of off-road equipment and vehicles traveling to and from the construction site. The CBC includes specific requirements related to recycling, construction materials, and energy efficiency standards that would apply to construction of future development envisioned by the 2042 GPU and would minimize wasteful, inefficient, and unnecessary energy consumption. Construction and operation of projects facilitated by the 2042 GPU would be required to comply with relevant provisions of CBC and Title 24 of the California Energy Code, which would avoid wasteful, inefficient, and unnecessary energy consumption. As a result, the construction of proposed facilities and improvements would not result in an inefficient, wasteful, or unnecessary consumption of energy.

Operational Mobile-Source Energy Consumption

Operational mobile-source energy consumption would be primarily associated with vehicle trips to and from the project. Energy use associated with commute trips are discussed in greater detail, as follows:

Table 1 summarizes the annual fuel use within the Fowler planning area for existing (year 2019) and build-out (year 2042) conditions. As noted in Table 1, the vehicle trips associated with existing year 2019 conditions would consume an annual estimated 1,451,044 gallons of diesel and 3,689,421 gallons of gasoline, which combined equates to 643,132 million metric British thermal units (MMBTU). With a service population (SP) of 6,808, existing year 2019 conditions would consume 94.5 MMBTU/capita. With the proposed build-out of the 2042 GPU, annual fuel consumption would increase to 5,885,630 gallons of diesel and 11,338,136 gallons of gasoline, which are equivalent to 2,172,393 MMBTU. With a projected population of 48,404, year 2042 build-out conditions would consume 44.9 MMBTU/capita. While the overall fuel consumption would increase with the adoption of the proposed 2042 GPU the efficiency of the fuel usage would improve significantly. The development of increasingly efficient automobile engines would further increase energy efficiency and energy conservation.

Operational Building-Use Energy Consumption

The proposed 2042 GPU would result in increased electricity and natural gas consumption associated with the long-term operation of the proposed land uses. It is important to note that buildings included in the 2042 GPU would be required to comply with Title 24 standards for energy efficiency, which would include increased building insulation and energy-efficiency requirements, including the use of energy-efficient lighting, energy-efficient appliances, and use of low-flow water fixtures.

Estimated electricity consumption associated with existing year 2019 conditions and the proposed build-out of the proposed 2042 GPU are summarized in Table 2. As depicted, under 2019 conditions the calculated total consumption was approximately 52,309,627 kilowatt hours per year (kWh/Year) of electricity, 7,296,595 kWh/Year for water use, treatment, and conveyance, and 213,620,578 kilo British thermal units per year (kBTU/Yr) of natural gas. In total, facilities under existing 2019 conditions use a total of approximately 416,997 MMBTU/year. Under the build-out of the proposed 2042 GPU, consumption would total approximately 336,659,330 kWh/Yr of electricity, 26,572,392 kWh/Year

Table 1. Operational Fuel Consumption

Source	Annual Fuel Use (gallons)	Annual MMBTU
Existing Conditions (Year 2019)		
On-Road Vehicles (Diesel)	1,451,044	199,346
On-Road Vehicles (Gasoline)	3,689,421	443,786
Total:		643,132
Estimated Population:		6,808
MMBTU/Capita		94.5
GPU Buildout Conditions (Year 2042)		
On-Road Vehicles (Diesel)	5,885,630	808,574
On-Road Vehicles (Gasoline)	11,338,136	1,363,819
Total:		2,172,393
Estimated Population:		48,404
MMBTU/Capita		44.9
<i>MMBTU = Million metric British thermal units</i>		
<i>Fuel use was calculated based, in part, on project trip generation rates derived from the traffic analysis prepared for this project (Kittelson & Associates 2022).</i>		
<i>Refer to Appendix A for modeling assumptions and results.</i>		

Table 2. Operational Electricity & Natural Gas Consumption

Source	Energy Use	MMBTU/Year
Existing Conditions (Year 2019)		
Electricity Consumption	52,309,627 kWh/year	178,480
Water Use, Treatment & Conveyance	7,296,595 kWh/Year	24,896
Natural Gas Use	213,620,578 kBTU/Year	213,621
Total:		416,997
Estimated Population:		6,808
MMBTU/Capita:		61.3
GPU Buildout Conditions (Year 2042)		
Electricity Consumption	336,659,330 kWh/year	1,148,682
Water Use, Treatment & Conveyance	26,572,392 kWh/Year	90,665
Natural Gas Use	862,651,820 kBTU/Year	862,652
Total:		2,101,998
Estimated Population:		48,404
MMBTU/Capita:		43.4
<i>MMBTU = Million metric British thermal units</i>		
<i>Fuel use was calculated based, in part, on default construction schedules, equipment use, and vehicle trips identified for the operation of similar land uses contained in the CalEEMod output files prepared for the air quality analysis conducted for this project. Refer to Appendix A for modeling assumptions and results.</i>		

for water use, treatment, and conveyance, and 862,651,820 kilo British thermal units per year (kBTU/Yr) of natural gas. In total, facilities under 2042 conditions would consume a total of approximately 2,101,998 MMBTU/year.

On a per capita basis, total consumption rates would total approximately 61.3 MMBTU/capita under existing conditions and approximately 43.4 MMBTU/capita under future year 2042 GPU buildout conditions. Based on the modeling conducted, per capita energy usage under the proposed 2042 GPU would improve in comparison to existing year 2019 conditions. However, at this time, most projects incorporated in the GPU do not have sufficient detail to allow project-level analysis and thus it would be speculative to analyze project-level impacts on energy consumption. Given that specific projects have the

potential to be wasteful, inefficient, or unnecessarily consume energy resources, this impact would be considered **potentially significant**.

Proposed GPU Policies that Provide Mitigation

The proposed GPU includes numerous goals and policies that would help to further reduce energy consumption, energy demands, and vehicle miles traveled. Relevant policies include policies: H-6.1, H-6.2, H-6.3 LU-21, CH1, CH-6, MOB-4, MOB-9, MOB-10, MOB-11, MOB-12, MOB-13, MOB-14, MOB-15, MOB-16, MOB-17, MOB-18.

As noted above, the GPU includes various other measures to reduce the energy consumption of new residential developments and promote the use of alternative means of transportation. These policies can promote the reduction of energy and fuel consumption. However, no policies have been proposed that require existing development or future commercial developments to evaluate and mitigate potential energy impacts.

Proposed Mitigation Measures

MM E-1: The following measures shall be implemented to further reduce energy use associated with the development of proposed facilities:

- Adopt local ordinances to require energy efficiency upgrade at the time of major remodel.
- Amend the building code to improve energy efficiency in new construction, repairs and alternations to existing buildings.
- Adopt residential and commercial energy conservation, renewable energy, and/or zero net energy ordinances (consider requirements for audits or updates at major renovation or time of sale)
- Incorporate renewable energy efficiency into public facilities capital improvements.
- Replace public lighting with energy-efficient lighting that meets or exceeds the State's building standards at the time of development.
- Implement large-scale energy storage in commercial and industrial buildings to control peak loads that meets or exceeds the State's building standards at the time of development.
- Require future development to incorporate on-site renewable energy generation (e.g., solar photovoltaic systems), that meets or exceeds the State's building standards at the time of development.

Significance After Mitigation

Mitigation measures have been included to reduce overall operational energy consumption, including those associated with long-term operational building energy use. With mitigation, operational energy consumption would be substantially reduced, beyond those required by Title 24 building energy-efficiency requirements. With mitigation, this impact would be considered **less than significant**

Impact E-2: Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

The projects incorporated in the 2042 GPU would be required to be in full compliance with the California Building Code, including applicable green building standards and building energy efficiency standards. Additionally, starting in 2023, all new homes constructed in California; as well as, numerous non-residential land uses, such as office buildings, schools, restaurants, warehouses, theaters, and grocery stores, would be required to include solar photovoltaic systems, per the CEC's 2022 Building Energy Efficiency Standards. In addition to complying with federal and state regulations, the GPU itself provides policies that are designed specifically to reduce energy consumption or to reduce other types of pollutants that have the co-benefit of reducing energy consumption. Furthermore, implementation of Mitigation Measure E-1 would help to ensure consistency with applicable regulatory requirements and would also help to promote the use of energy from renewable sources (e.g., solar). For these reasons, implementation of the proposed GPU would not be anticipated to conflict with or obstruct state or local plans for renewable energy or energy efficiency. This impact would be considered **less than significant**.

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APPENDIX A

Energy Modeling

Energy Use Summary Operational Year 2019

Operational Fuel Use

	Gallons	Annual MMBTU
Mobile Fuel (Diesel)	1,451,044	199,346
Mobile Fuel (Gasoline)	3,689,421	443,786
	Total:	643,132

Operational Electricity & Natural Gas Use

	Annual Energy	Annual MMBTU
Electricity (kWh/yr, MMBTU)	52,309,627	178,480
Water Use, Treatment & Conveyance (kWh/Yr, MMBTU)	7,296,594	24,896
Natural Gas (kBTU/yr, MMBTU)	213,620,578	213,621
	Total:	416,997

Energy Use Summary Operational Year 2042

Operational Fuel Use

	Gallons	Annual MMBTU
Mobile Fuel (Diesel)	5,885,630	808,574
Mobile Fuel (Gasoline)	11,338,136	1,363,819
	Total:	2,172,393

Operational Electricity & Natural Gas Use

	Annual Energy	Annual MMBTU
Electricity (kWh/yr, MMBTU)	336,659,330	1,148,682
Water Use, Treatment & Conveyance (kWh/Yr, MMBTU)	26,572,392	90,665
Natural Gas (kBTU/yr, MMBTU)	862,651,820	862,652
	Total:	2,101,998