

**State Center Community College District  
First Responders Campus Project  
Draft Environmental Impact Report**  
(State Clearinghouse No. 2020039018)

**Appendix C  
Energy Analysis**

# **ENERGY IMPACT ASSESSMENT**

**FOR THE PROPOSED**

## **STATE CENTER COMMUNITY COLLEGE DISTRICT FIRST RESPONDERS CAMPUS PROJECT**

**COUNTY OF FRESNO, CA**

**APRIL 2021**

**PREPARED FOR:**

ODELL PLANNING & RESEARCH, INC.  
49346 ROAD 426, SUITE 2  
OAKHURST, CA 93644

**PREPARED BY:**



612 12<sup>TH</sup> STREET, SUITE 201  
PASO ROBLES, CA 93446  
TEL: 805.226.2727

# TABLE OF CONTENTS

Introduction .....	4
Proposed Project .....	4
Energy Fundamentals .....	4
Existing Setting .....	4
Energy Resources .....	7
Electricity .....	7
Natural Gas .....	7
Regulatory Framework .....	8
Federal .....	8
State .....	9
Local .....	12
Impact Analysis .....	12
Thresholds of Significance .....	12
Methodology .....	13
Construction Impacts .....	13
Operational Impacts .....	13
Project Impacts and Mitigation Measures .....	13
References .....	16

**LIST OF TABLES**

Table 1. Construction Energy Consumption .....	14
Table 2. Operational Fuel Consumption .....	14
Table 3. Operational Electricity, Water, and Natural Gas Consumption .....	14

**LIST OF FIGURES**

Figure 1. Site Vicinity Map .....	5
Figure 2. Site Plan .....	6
Figure 3. Pacific Gas & Electric 2019 Power Content Label .....	7

**APPENDICES**

Appendix A: Energy Modeling

## LIST OF COMMON TERMS & ACRONYMS

°F	Degrees Fahrenheit
AB	Assembly Bill
AFV	Alternative Fuel Vehicle
APS	Alternative Planning Strategy
ARB	California Air Resource Board
BSC	Building Standards Commission
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CALGreen	California Green Building Standards Code
CBC	California Building Code
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO <sub>2</sub>	Carbon Dioxide
CPUC	California Public Utilities Commission
EAP	Energy Action Plan
EMFAC	Emissions Factor
EO	Executive Order
EPAct	Energy Policy Act
GHG	Greenhouse Gas
kBTU	Kilo British Thermal Units
kWh	Kilowatt Hour
MMBTU	Million British Thermal Units
mpg	Miles per Gallon
MPO	Metropolitan Planning Organization
NHSTA	National Highway Traffic Safety Administration
PG&E	Pacific Gas and Electric
RPS	Renewables Portfolio Standard
RTP	Regional Transportation Plan
SAF	State Alternative Fuel
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SCCCD	State Center Community College District
SCS	Sustainable Communities Strategy
SoCalGas	Southern California Gas Company
U.S. DOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
VMT	Vehicle Mile Traveled

# INTRODUCTION

This report provides an analysis of potential energy impacts associated with the proposed First Responders Campus Project. This report also provides a summary of existing conditions in the project area and the applicable regulatory framework pertaining to energy.

## PROPOSED PROJECT

The State Center Community College District (SCCCD) is proposing to undertake the First Responders Campus Project (project).

The SCCCDC proposed campus for first responders is to be located on the western half of an approximately 40-acre site northwest of the intersection of Willow and North Avenues in Fresno County, California. The proposed campus will include a fire academy, police academy, and EMT training in numerous small cohorts moving through the academy programs. Approximately 270 students would be on the campus at any one time, staffed by up to 50 employees, including administrators, faculty, and support staff. Site access is expected to be from one or more driveways connecting to North Avenue, with left turns into the site allowed from eastbound North Avenue.

The facilities will include a total of approximately 62,000 square feet of building area with a spot tower, a scenario village, and a virtual-reality/simulation laboratory, which may include joint use with the City of Fresno and other agencies. The police and fire academies are expected to begin daily operations at 7:00 a.m. and finish at approximately 5:00 p.m., although night classes until 10:00 p.m. are possible. Day courses for EMT training are likely to begin at 8:00 a.m. and end at 5:00 p.m. on Tuesdays, Wednesdays, and Thursdays. Evening courses for EMT training are likely to start at 6:00 p.m. and end by 10:00 p.m. on Tuesdays and Thursdays.

Construction is planned to occur from late 2021 to the middle of 2023.

A site vicinity map is presented in Figure 1, Site Vicinity Map, and a site plan is presented in Figure 2, Site Plan.

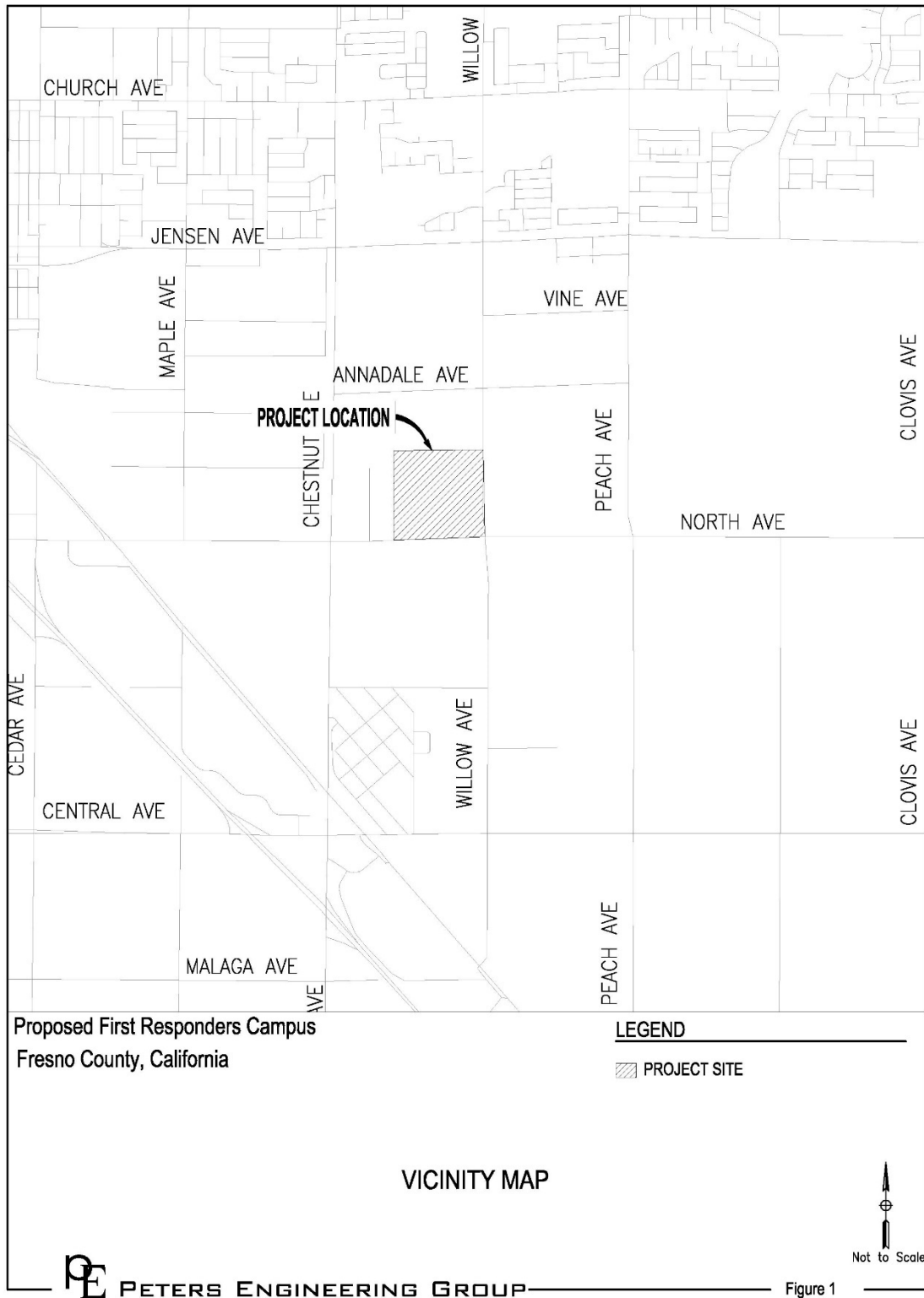
## ENERGY FUNDAMENTALS

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

## EXISTING SETTING

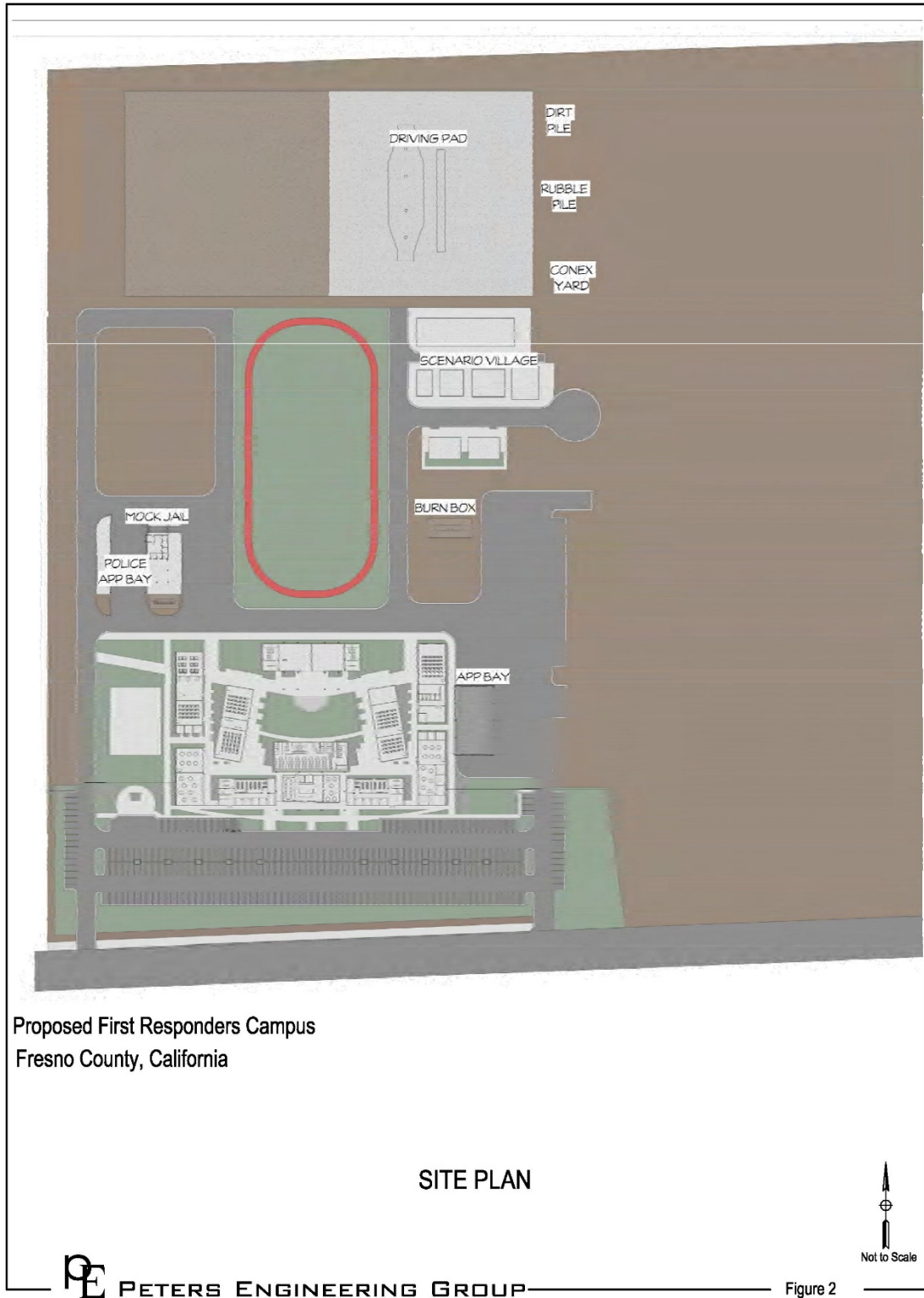
The project is located in the County of Fresno. The project area has a semi-arid climate with an annual average precipitation of approximately 11 inches. Temperatures in the project area range from an average minimum of approximately 37 degrees Fahrenheit (°F), in December, to an average maximum of 98°F, in July (WRCC 2021).

**Figure 1. Site Vicinity Map**



Source: PEG 2021

Figure 2. Site Plan



Source: PEG 2021

## Energy Resources

Energy sources for the County of Fresno are primarily served by Pacific Gas & Electric (PG&E) and Southern California Gas Company (SoCalGas). 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 buildings.

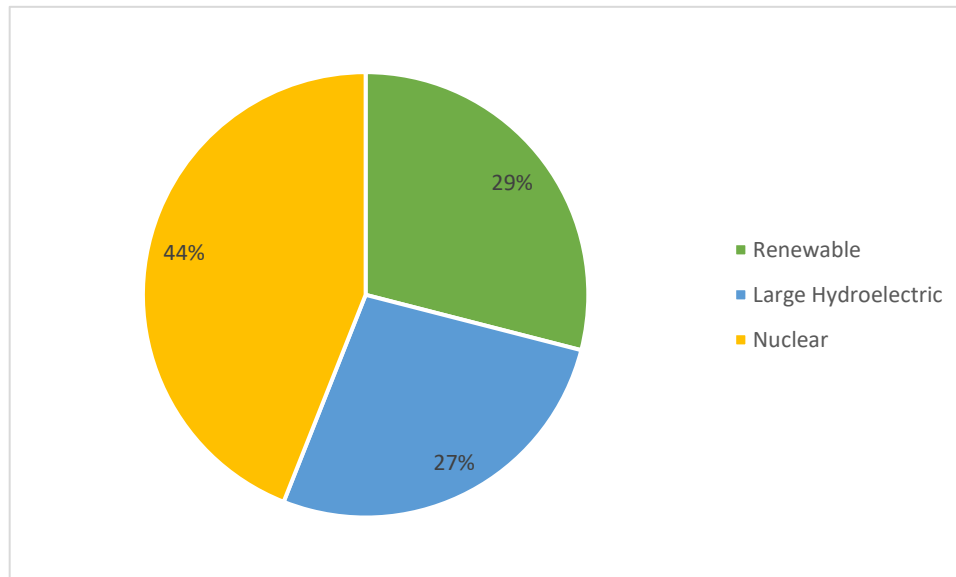
### ***Electricity***

Electric services in the County of Fresno are provided by PG&E.

#### **Pacific Gas & Electric**

The breakdown of PG&E's power mix is shown in Figure 3. As shown, PG&E's energy generation was supplied from approximately 29% of renewable energy sources (i.e., biomass and waste, geothermal, small hydroelectric, solar, and wind), 27% of large hydroelectric sources, and 44% of nuclear sources. Participation in PG&E as an electricity provider is mandatory.

**Figure 3. Pacific Gas & Electric 2019 Power Content Label**



Source: PG&E 2020a

### ***Natural Gas***

Natural gas services in the County of Fresno are provided by PG&E and SoCalGas. PG&E's natural gas system encompasses approximately 70,000 square miles in Northern and Central California. Natural gas throughput provided by PG&E totals approximately 2.6 billion cubic feet per day (PG&E 2020b). 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 (CO<sub>2</sub>) 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 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 required by AB 32. This initial Scoping Plan contained the main strategies to be implemented in order 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, and 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 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 reach the 2050 goals (ARB 2014). The most recent update released by 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 in 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), CEC and the California Air Resource Board (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, in response to the CEC's 2003 and 2005 Integrated Energy Policy Reports, Governor Davis directed CEC to take the lead in developing a long-term plan to increase alternative fuel use. A performance-based goal of AB 2076 was to reduce petroleum demand to 15 percent below 2003 demand by 2020.

### **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 year 2020 to 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 2011 Bioenergy Action Plan identifies those barriers and recommends actions to address them so that the State can meet its clean energy, waste reduction, and climate protection goals. The 2012 Bioenergy Action Plan updates the 2011 plan and provides a more 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.

### **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 improvement 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 buildings 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 green buildings standards were updated in May 2018. Referred to as the 2019 Building Energy Efficiency Standards, these updates focus on 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 nonresidential lighting requirements. Under the newly adopted standards, nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades (CEC 2018).

### **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).

## Local

### Fresno County General Plan

The Fresno County General Plan is a comprehensive, long-term framework for the protection of the county's agricultural, natural, and cultural resources and for development in the county (County of Fresno 2000). Designed to meet State general plan requirements, it outlines policies, standards, and programs and sets out plan proposals to guide day-to-day decisions concerning Fresno County's future. Applicable energy policies and programs include, but are not limited to:

- Policy LU-H.7(j): Energy conservation, and utilization of renewable resources should be given prominent consideration.
- Program H-I.B: The County shall consider inclusion of design standards for new development that encourage alternative transportation (for example, bicycle lanes, bus turnouts, and direct pedestrian connections to transit lines) as a part of the update of the County Zoning Ordinance to conserve energy and improve air quality.
- Policy H-J.2: The County shall promote public awareness of the need for energy conservation.
- Policy H-J.5: The County shall promote and support Pacific Gas and Electric Company's "Energy Partnership Program" aimed at education and conservation efforts.
- Policy H-J.5: The County shall promote and encourage the use of architectural design standards that reduce energy use.

## IMPACT ANALYSIS

### Thresholds of Significance

In accordance with Appendix F and G of the California Environmental Quality Act (CEQA) Guidelines, energy use impacts associated with the proposed project would be considered significant if it would:

- a) Result in the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation; or
- b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

The CEQA Guidelines, Appendix F, requires 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

### *Construction Impacts*

Regarding energy use during construction (e.g., fuel use), it is assumed that only diesel fuel would be used in construction equipment. On-road vehicles for hauling materials and worker commute trips are assumed to use a mix of diesel and gasoline fuel. Construction schedules, equipment numbers, horsepower ratings, and load factors were used to calculate construction-related fuel use, based on default assumptions contained in the California Emissions Estimator Model (CalEEMod), version 2016.3.2. Diesel fuel use was estimated based on a factor of 0.05 gallons of diesel fuel per horsepower-hour derived from the South Coast Air Quality Management District's (SCAQMD) CEQA Air Quality Handbook (SCAQMD 1993). Energy uses were quantified for site preparation, grading, building construction, and paving. Demolition is not anticipated during construction.

### *Operational Impacts*

The long-term operation of the proposed project would require electricity and natural gas usage for lighting, water conveyance, and landscaping maintenance equipment. Indirect energy use would include solid waste removal. Project operation would include the consumption of diesel and gasoline fuel from on-road vehicles. Building energy use was estimated using the CalEEMod. With continued improvements in building energy efficiencies, energy use in future years would be less. Transportation fuel-use estimates were calculated by applying average fuel usage rates per vehicle mile to VMT associated with the proposed project. A maximum daily trip rate of 1,256 was used to calculate mobile-source emissions (PEG 2021). Annual energy usage was quantified based on CalEEMod default assumptions for PG&E, including compliance with the RPS. Average fuel usage rates by vehicle class, fuel type (e.g., diesel, gasoline, electric, and natural gas), and calendar year were obtained for Fresno County's emissions inventory and derived from ARB's Emissions Factors (EMFAC) 2017 version 1.0.3 (ARB 2017).

## Project Impacts and Mitigation Measures

### **Impact E-A. Would the project result in the wasteful, inefficient, or unnecessary consumption of energy**

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. Energy consumption associated with short-term construction and long-term operational activities are discussed in greater detail, as follows:

### **Construction-Related Energy Consumption**

Energy consumption would occur during construction, including fuel use associated with the on-site operation of off-road equipment and vehicles traveling to and from the construction site. Table 1 summarizes the levels of energy consumption associated with project construction. As depicted, the operation of off-road construction equipment would use an annual estimated of 32,376 gallons of diesel. On-road vehicles would use an annual estimated of 31,490 gallons of gasoline and 322 gallons of diesel. In total, construction fuel use would equate to approximately 8,281 million British thermal units (MMBTU) per year. Construction equipment use and associated energy consumption would be typical of that commonly associated with the construction of new land uses. As a result, project construction would not be anticipated to require the use of construction equipment that would be less energy efficient than those commonly used for the construction of similar facilities. Furthermore, on-site construction equipment may include alternatively-fueled vehicles (e.g., natural gas) where feasible. Energy use associated with the construction of the proposed project would be temporary and would not be anticipated to result in the need for additional capacity, nor would construction be anticipated to result in increased peak-period demands for electricity. As a result, the construction of the proposed project would not result in an inefficient, wasteful, or unnecessary consumption of energy. As a result, impacts are considered **less than significant**.

**Table 1. Construction Energy Consumption**

Source	Annual Fuel Use (gallons)	Annual MMBTU
Off-Road Equipment Use (Diesel)	32,376	4,448
On-Road Vehicles (Gasoline)	31,490	3,789
On-Road Vehicles (Diesel)	322	44
Total:		8,281
MMBTU = Million British thermal units Fuel use was calculated based, in part, on default construction schedules, the equipment uses, and vehicle trips identified for the construction 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.		

**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 2 summarizes the annual fuel use at build-out. As shown in Table 2, the vehicle trips associated with the proposed land use would consume an annual estimated 67,076 gallons of diesel and 138,738 gallons of gasoline. The development of increasingly efficient automobile engines would result in increased energy efficiency and energy conservation. Implementation of GHG Mitigation Measure GHG-1 would also ensure that the proposed project reduces motor vehicle use and operational fuel consumption. The proposed project would not result in increased fuel usage that would be considered unnecessary, inefficient, or wasteful. This impact would be considered **less than significant**.

**Table 2. Operational Fuel Consumption**

Source	Annual Fuel Use (gallons)	Annual MMBTU
On-Road Vehicles (Diesel)	67,076	9,215
On-Road Vehicles (Gasoline)	138,738	16,695
Total:		25,910
MMBTU = Million British thermal units Fuel use was calculated based, in part, on project trip generation rates derived from the traffic analysis for the project. Refer to Appendix A for modeling assumptions and results.		

**Operational Building-Use Energy Consumption**

The proposed project would result in increased electricity and natural gas consumption associated with the long-term operation of the proposed land use.

Estimated electricity and natural gas consumption associated with the proposed facilities are summarized in Table 3. As depicted, the project would result in the annual consumption of approximately 708,040 kilowatt hours (kWh) of electricity, 27,291 kWh of water, and 1,369,580 kilo British thermal units (kBtu) of natural gas. In total, the proposed project would consume an annual total of approximately 3,879 MMBTU. The development of increasingly efficient building fixtures would result in increased energy efficiency and energy conservation. The project would be subject to energy conservation requirements in the CEC (Title 24, Part 6, of the California Code of Regulations, California’s Energy Efficiency Standards for Residential and Nonresidential Buildings), and the California Green Building Standards Code (CALGreen) (Title 24, Part 11 of the California Code of Regulations). Adherence to Title 24 requirements and previously noted, Fresno County General Plan energy policies and programs would ensure that the project would not result in wasteful and inefficient use of non-renewable resources due to building operation. For this reason, this impact would be considered **less than significant**.

**Table 3. Operational Electricity, Water, and Natural Gas Consumption**

Source	Annual Energy Use	Annual MMBTU
Electricity (kWh)	708,040	2,416
Water (kWh)	27,291	93
Natural Gas Use (kBtu)	1,369,580	1,370
Total:		3,879
MMBTU = Million British thermal units; kWh = Kilowatt hour; kBtu = Kilo British thermal unit		

**Impact E-B. Would the project conflict with or obstruct a state or local plan for renewable energy or**

The project would be required to be in full compliance with the CBC, including applicable green building standards and building energy efficiency standards. Furthermore, implementation of GHG Mitigation Measure GHG-1 would comply with applicable Fresno County General Plan energy policies and programs. The energy policies and programs ensure the conservation and preservation of energy resources by increasing the energy efficiency of buildings, appliances, and buildings to the use of alternative forms of energy. The project would not conflict with other goals and policies set forth Fresno County General Plan pertaining to renewable energy and energy efficiency. Furthermore, implementation of GHG Mitigation Measure GHG-1 would ensure that the proposed project reduces motor vehicle use and operational fuel consumption. Therefore, the proposed project would not conflict with state or local plans for renewable energy or energy efficiency, this impact would be considered **less than significant**.



## REFERENCES

- California Air Resources Board (ARB). 2003. *Reducing California's Petroleum Dependence*. Available at: <https://www.arb.ca.gov/fuels/corefinery/ab2076final.pdf>
- California Air Resources Board (ARB). 2014. *First Update to the Climate Change Scoping Plan*. Available at: [https://www.arb.ca.gov/cc/scopingplan/2013\\_update/first\\_update\\_climate\\_change\\_scoping\\_plan.pdf](https://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf)
- California Air Resources Board (ARB). 2016. *California's Advanced Clean Cars Program*. Available at: <https://www.arb.ca.gov/msprog/acc/acc.htm>
- California Air Resources Board (ARB). 2017. *Mobile Source Emissions Inventory – Categories*. Available at: <https://www.arb.ca.gov/msei/categories.htm>
- California Energy Commission (CEC). 2018. *2019 Building Energy Efficiency Standards*. Available at: [https://ww2.energy.ca.gov/title24/2019standards/documents/2018\\_Title\\_24\\_2019\\_Building\\_Standards\\_FAQ.pdf](https://ww2.energy.ca.gov/title24/2019standards/documents/2018_Title_24_2019_Building_Standards_FAQ.pdf)
- California Energy Commission (CEC). 2020. *California Biomass and Waste-To-Energy Statistics and Data*. Available at: [https://ww2.energy.ca.gov/almanac/renewables\\_data/biomass/index\\_cms.php](https://ww2.energy.ca.gov/almanac/renewables_data/biomass/index_cms.php)
- County of Fresno. 2000. *Fresno County General Plan. Policy Document*. Website URL: <https://www.co.fresno.ca.us/home/showpublisheddocument?id=18117>
- Pacific Gas and Electric (PG&E). 2020a. *Where your electricity comes from*. Available at: [https://www.pge.com/pge\\_global/common/pdfs/your-account/your-bill/understand-your-bill/bill-inserts/2020/1220-PowerContent-ADA.pdf](https://www.pge.com/pge_global/common/pdfs/your-account/your-bill/understand-your-bill/bill-inserts/2020/1220-PowerContent-ADA.pdf)
- Pacific Gas and Electric (PG&E). 2020b. *Learn about the PG&E natural gas system*. Available at: [https://www.pge.com/en\\_US/safety/how-the-system-works/natural-gas-system-overview/natural-gas-system-overview.page](https://www.pge.com/en_US/safety/how-the-system-works/natural-gas-system-overview/natural-gas-system-overview.page)
- Peters Engineering Group (PEG). 2021. *Traffic Impact Study. Proposed First Responders Campus*.
- South Coast Air Quality Management District (SCAQMD). 1993. *CEQA Air Quality Handbook*. Available at: [https://www.energy.ca.gov/sitingcases/ivanpah/documents/others/2009-08-12\\_Attachem AQ1-1\\_CEQA\\_Air\\_Quality\\_Handbook\\_TN-47534.PDF](https://www.energy.ca.gov/sitingcases/ivanpah/documents/others/2009-08-12_Attachem AQ1-1_CEQA_Air_Quality_Handbook_TN-47534.PDF)
- Southern California Gas Company (SoCalGas). 2013. *Pipeline Basics*. Available at: <https://www.socalgas.com/documents/news-room/fact-sheets/PipelineBasics.pdf>
- Southern California Gas Company (SoCalGas). 2020. *Natural Gas Transmission*. Available at: <https://www.socalgas.com/stay-safe/pipeline-and-storage-safety/natural-gas-transmission>
- United States Environmental Protection Agency (U.S. EPA). 2017. *Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emissions Standards for Model Years 2022-2025*. Available at: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/midterm-evaluation-lightduty-vehicle-greenhouse-gas>
- United States Environmental Protection Agency (U.S. EPA). 2018. *Mid-term Evaluation of Greenhouse Gas Emissions Standards for Model Year 2022-2025 Light-duty Vehicles*. Available at: <https://www.epa.gov/sites/production/files/2018-04/documents/mte-final-determination-notice-2018-04-02.pdf>
- Western Regional Climate Center (WRCC). 2021. *Period of Record Monthly Climate Summary. FRESNO YOSEMITE INTL AP, CALIFORNIA (043257)*. Website URL: <https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca3257>

## **APPENDIX A**

### **ENERGY MODELING**

# Energy Use Summary

## Construction Energy Use

	Annual Gallons	Annual MMBTU
Off-Road Equipment Fuel (Diesel)	32,376	4,448
On-Road Vehicle Fuel (Gasoline)	31,490	3,789
On-Road Vehicle Fuel (Diesel)	322	44
<b>Total:</b>		8,281

MMBTU = Million British thermal unit

## Operational Fuel Use

	Annual Gallons	Annual MMBTU
Mobile Fuel (Diesel)	67,076	9,215
Mobile Fuel (Gasoline)	138,738	16,695
<b>Total:</b>		25,910

MMBTU = Million British thermal unit

## Operational Electricity, Water, and Natural Gas Use

	Annual Energy	Annual MMBTU
Electricity (kWh)	708,040	2,416
Water Use, Treatment & Conveyance (kWh)	27,291	93
Natural Gas (kBTU)	1,369,580	1,370
<b>Total:</b>		3,879

MMBTU = Million British thermal unit; kWh = Kilowatt hour; kBTU = Kilo British thermal unit

## Construction Fuel Use - Off-Road Vehicles and Equipment

### OFF-ROAD VEHICLES AND EQUIPMENT FUEL USE

Primary Construction Activity	Activity Duration (Days)	Equipment Type	Size (hp)	Number of Pieces	Hours of Daily Use/Piece of Equipment	Total Days of Use	Load Factor	Fuel Usage Rate (gal/hp-h)	Total Fuel Diesel (Gallons)
Demolition	0	Excavators	158	0	0	0	0.38	0.05	0
		Concrete Saws	81	0	0	0	0.73	0.05	0
		Rubber Tired Dozer	247	0	0	0	0.40	0.05	0
Site Preparation	15	Rubber Tired Dozers	247	3	8	15	0.40	0.05	1,778
		Tractors/Loaders/Backhoes	97	4	8	15	0.37	0.05	861
Grading	38	Excavators	158	2	8	38	0.38	0.05	1,825
		Graders	187	1	8	38	0.41	0.05	1,165
		Rubber Tired Dozers	247	1	8	38	0.40	0.05	1,502
		Scrapers	367	2	8	38	0.48	0.05	5,355
Building Construction	370	Tractors/Loaders/Backhoes	97	2	8	38	0.37	0.05	1,091
		Cranes	231	1	7	370	0.29	0.05	8,675
		Forklifts	89	3	8	370	0.20	0.05	7,903
		Generator Sets	84	1	8	370	0.74	0.05	9,200
		Tractors/Loaders/Backhoes	97	3	7	370	0.37	0.05	13,943
Paving	28	Welders	46	1	8	370	0.45	0.05	3,064
		Pavers	130	2	8	28	0.42	0.05	1,223
		Paving Equipment	132	2	8	28	0.36	0.05	1,064
Architectural Coating	28	Rollers	80	2	8	28	0.38	0.05	681
		Air Compressors	78	1	6	28	0.48	0.05	314

hp = Horsepower; gal/hp-h = Gallons per horsepower - hour; BTU = British thermal unit; MMBTU = Million British thermal unit  
 Equipment usage assumptions based on default assumptions contained in CalEEMod.

<b>Total Diesel Fuel Use (Gallons):</b>	59,646
<b>Number of Construction Years:</b>	1.8
<b>Average Diesel Fuel Use/Year:</b>	32,376
<b>BTU/Gallon:</b>	137,381
<b>BTU:</b>	8,194,273,011
<b>MMBTU:</b>	8,194
<b>MMBTU/Year:</b>	4,448

## Construction Fuel Use - On-Road Vehicles

### ON-ROAD VEHICLE FUEL USE

Activity	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Total	LDA	LDT1	LDT2	MDV	HDV
Days	15	38	370	28	28						
Worker Trips	18	20	27	15	5						
Miles/Trip	16.8	16.8	16.8	16.8	16.8						
Total VMT	4,536	12,768	167,832	7,056	2,352	194,544	64,848	64,848	64,848	0	0
Vendor Trips	0	0	10	0	0						
Miles/Trip	6.6	6.6	6.6	6.6	6.6						
Total VMT	0	0	24,420	0	0	24,420	0	0	0	24,420	0
Haul Trips	0	0	0	0	0						
Miles/Trip	20	20	20	20	20						
Total VMT	0	0	0	0	0	0	0	0	0	0	0

VMT = Vehicle miles traveled

Gasoline	Total VMT	Gallons/Mile*	Gallons	BTU/Gallon**	BTU	MMBTU	MMBTU/Year	Gallons/Year
LDA	63,859	0.27	17,006	120,333	2,046,442,644	2,046	1,111	9,231
LDT1	63,859	0.30	18,939	120,333	2,279,003,315	2,279	1,237	10,280
LDT2	63,859	0.33	21,181	120,333	2,548,748,164	2,549	1,383	11,497
MDV	24,047	0.04	888	120,333	106,898,419	107	58	482

VMT = Vehicle miles traveled; BTU = British thermal unit; MMBTU = Million British thermal unit

\*Gallons per mile based on year 2021 conditions for Fresno County. Derived from EMFAC2017 (v1.0.3) Emissions Inventory.

\*\*Energy coefficient derived from U.S. EIA.

Diesel	Total VMT	Gallons/Mile*	Gallons	BTU/Gallon**	BTU	MMBTU	MMBTU/Year	Gallons/Year
LDA	989	0.17	170	137,381	23,347,938	23	13	92
LDT1	989	0.18	174	137,381	23,913,577	24	13	94
LDT2	989	0.24	236	137,381	32,392,517	32	18	128
MDV	373	0.04	14	137,381	1,890,818	2	1	7

VMT = Vehicle miles traveled; BTU = British thermal unit; MMBTU = Million British thermal unit

\*Gallons per mile based on year 2021 conditions for Fresno County. Derived from EMFAC2017 (v1.0.3) Emissions Inventory.

\*\*Energy coefficient derived from U.S. EIA.

**Construction Fuel Use - On-Road Vehicles**  
**Construction Fuel Use - On-Road Vehicles**

EMFAC2017 Fuel Rate Calculation	Fuel Consumption (1000 Gallons/Day)*		VMT (Miles/Day)**		
	Diesel	Gasoline	Diesel	Gasoline	TOTAL
LDA	2.24	450.58	13041.17	1691918.99	
LDT1	0.02	52.13	93.98	175754.88	
LDT2	0.64	198.00	2687.42	596970.03	
MDV	3.20	215.18	86518.71	4140987.57	
<b>Total</b>	<b>6.09</b>	<b>915.89</b>	<b>102341.28</b>	<b>6605631.46</b>	<b>6707972.74</b>
<b>Percent of Total</b>			0.02	0.98	
<b>LDA-Miles/Gallon</b>	5.82	3.75			
<b>LDA-Gallons/Mile</b>	0.17	0.27			
<b>LDT1-Miles/Gallon</b>	5.68	3.37			
<b>LDT1-Gallons/Mile</b>	0.18	0.30			
<b>LDT2-Miles/Gallon</b>	4.20	3.01			
<b>LDT2-Gallons/Mile</b>	0.24	0.33			
<b>MDV-Miles/Gallon</b>	27.07	19.24			
<b>MDV-Gallons/Mile</b>	0.04	0.05			

VMT = Vehicle miles traveled

Fuel consumption and VMT based on Fresno County.

\*Fuel consumptions derived from EMFAC2017 (v1.0.3) for year 2021 conditlons.

\*\*VMT derived from EMFAC2017 (v1.0.3) for year 2021 conditons.

## Operational Fuel Use - On-Road Vehicles

### ON-ROAD VEHICLE FUEL USE

LAND USE	Annual VMT
Junior College	4,391,830
Total	4,391,830

VMT = Vehicle miles traveled

	Annual VMT	Gallons/Mile*	Gallons	BTU/Gallon**	BTU	MMBTU
<b>Diesel</b>	586,245	0.11	67,076	137,381	9,214,997,389	9,215
<b>Gasoline</b>	3,805,585	0.04	138,738	120,333	16,694,722,701	16,695

VMT = Vehicle miles traveled; BTU = British thermal unit; MMBTU = Million British thermal unit

\*Gallons per mile based on year 2024 conditions for Fresno County. Derived from EMFAC2017 (v1.0.3) Emissions Inventory.

\*\*Energy coefficient derived from U.S. EIA.

**Operational Fuel Use - On-Road Vehicles**  
**Operational Fuel Use - On-Road Vehicles**

EMFAC2017 Fuel Rate Calculation	Fuel Consumption (1000 Gallons/Day)*		VMT (Miles/Day)**	
	Diesel	Gasoline	Diesel	Gasoline
All Other Buses	1.126075202		10917.78051	
LDA	2.617033897	439.3860413	143056.4597	14641841.35
LDT1	0.012078067	50.40365765	320.9439304	1420789.367
LDT2	0.796226704	182.0001116	32232.39337	4794679.772
LHD1	18.80412128	38.41151607	343899.4509	328049.6356
LHD2	7.512878238	7.326304932	122653.4263	54214.43004
MCY		3.794715687		143680.6365
MDV	3.326210975	181.7026156	97267.43592	3809022.188
MH	0.622461141	2.866713014	6211.768507	14169.27164
Motor Coach	1.242915546		8193.361201	
PTO	2.956374635		15698.62652	
OBUS		3.176153125		15359.19986
SBUS	4.170902049	0.523868083	33718.66982	5008.773596
T6 Ag	0.077794751		705.6481452	
T6 CAIRP heavy	2.593973996		31005.10848	
T6 CAIRP small	0.389535003		4322.783547	
T6 instate construction heavy	4.543240545		39218.93407	
T6 instate construction small	14.56421982		126688.4133	
T6 instate heavy	22.48756282		237641.0701	
T6 instate small	21.98588483		225293.5021	
T6 OOS heavy	1.485036684		17750.27577	
T6 OOS small	0.227964362		2529.565597	
T6 Public	0.986218788		7149.576938	
T6 utility	0.19980405		1900.274661	
T6TS		10.61038415		52657.23318
T7 Ag	0.136000842		779.2144455	
T7 CAIRP	69.73559899		496862.8072	
T7 CAIRP construction	4.588607494		28171.30103	
T7 NNOOS	80.28359769		605688.7556	
T7 NOOS	28.10204099		195220.4321	
T7 other port	1.52969966		9597.249321	
T7 POAK	6.400526281		38512.6651	
T7 POLA	6.544852952		39183.41458	
T7 Public	3.075711476		17854.48637	
T7 Single	11.65237111		79061.42106	
T7 single construction	12.08867801		69887.81629	
T7 SWCV	6.56228167		16590.21883	
T7 tractor	91.77018771		728714.881	
T7 tractor construction	10.04099575		57651.29546	
T7 utility	0.123195856		740.5479684	
T7IS		0.117344581		497.0627275
UBUS	0.339261118	1.552571801	2534.80145	7049.497546
<b>Total</b>	<b>445.702121</b>	<b>921.8719977</b>	<b>3895426.777</b>	<b>25287018.42</b>
<b>Percent of Total</b>			<b>13.35%</b>	<b>86.65%</b>
<b>Miles/Gallon</b>	<b>8.739978101</b>	<b>27.43007541</b>		
<b>Gallons/Mile</b>	<b>0.114416763</b>	<b>0.036456334</b>		

29182445.19

VMT = Vehicle miles traveled

Fuel consumption and VMT based on Fresno County.

\*Fuel consumptions derived from EMFAC2017 (v1.0.3) for year 2024 conditons.

\*\*VMT derived from EMFAC2017 (v1.0.3) for year 2024 conditons.



## Operational Water Energy Use

### WATER ENERGY USE

	WATER USE*	ELECTRIC INTENSITY FACTORS (kWh/Mgal)		ANNUAL ELECTRIC USE (kWh/Yr)		
		Mgal/Yr	INDOOR	OUTDOOR	INDOOR	OUTDOOR
<b>ANNUAL INDOOR WATER USE</b>	3.04	3,500		10,644		27,291
<b>ANNUAL OUTDOOR WATER USE</b>	4.76		3,500		16,648	

Mgal = Million gallons; kWh = Kilowatt hour; BTU = British thermal unit; MMBTU = Million British thermal unit

\*Based on estimated water use derived from CalEEMod.

\*\*Energy coefficient derived from US EIA.

**BTU/kWh\*\*** 3,412  
**BTU:** 93,118,223  
**MMBTU:** 93

## Operational Electricity and Natural Gas Use

### ELECTRICITY ENERGY USE

	kWh/Yr	MWh/Yr	BTU/kWh*	BTU	MMBTU
Junior College	708,040				
Electricity	708,040	708	3,412	2,415,832,480	2,416

kWh = Kilowatt hour; MWh = Megawatt hour; BTU = British thermal unit; MMBTU = Million british thermal unit

\*Energy coefficient derived from U.S. EIA.

### NATURAL GAS ENERGY USE

	kBTU/Yr			BTU	MMBTU
Junior College	1,369,580				
Natural Gas	1,369,580			1,369,580,000	1,370

kBTU = Kilo British thermal unit; BTU = British thermal unit; MMBTU = Million British thermal unit

\*Energy coefficient derived from U.S. EIA.