

4.11.1 INTRODUCTION

This section evaluates potential impacts associated with energy consumption and demand that would result from the implementation of the proposed Green Valley II Mixed-Use project (“proposed project”). The section also provides a description of the regulatory framework governing the management of energy on a federal, state, regional, and local level. Project impacts on energy consumption and demand as well as related mitigation measures have also been provided.

No public or agency comments related to energy were received in response to the Notice of Preparation (NOP) issued for this EIR.

4.11.2 ENVIRONMENTAL SETTING

Electric Supply

Electricity in the City of Fairfield (City) is supplied by Pacific Gas and Electric Company (PG&E). PG&E owns and operates electricity infrastructure in the city and throughout Northern California that includes power lines, powerhouses, and substations. PG&E operates approximately 159,000 circuit miles of transmission and distribution lines. Outside suppliers to PG&E include the California Department of Water Resources (DWR), irrigation districts, renewable energy suppliers, and other fossil fuel-fired suppliers. In 2016, the total electricity consumption in Solano County was about 7,435 gigawatt hours (GWh) (CEC 2016a).

Electricity generated within the State of California in 2017 was from natural gas (43 percent), renewable resources (29 percent), large hydroelectric (18 percent), nuclear (9 percent), and coal (<1 percent) (CEC 2018a). The rest of the electricity used in the state was generated within the United States either in the Southwest or Pacific Northwest. The State of California power mix, based on in-state generation and out-of-state purchases in 2017 was comprised of natural gas (34 percent), renewable resources (29 percent), large hydroelectric (15 percent), coal (4 percent), nuclear (9 percent), and additional unspecified sources of power (9 percent) (CEC 2018a). In 2017, the total system power for California was 292,039 GWh, which is up about 0.5 percent from 2016’s total system electric generation of 290,567 GWh (CEC 2018a).

Natural Gas

PG&E supplies natural gas to the City of Fairfield. PG&E obtains most of its natural gas supplies from western Canada and the remainder from U.S. sources. PG&E operates approximately 48,000 miles of

transmission and distribution pipelines, and three underground storage fields with a combined storage capacity of 48.7 billion cubic feet (Bcf). In 2016, the total natural gas consumption in Solano County was about 25,370,819,544 million British thermal Units per year (MBTU/year) (CEC 2016b).

In 2012, natural gas used within California was extracted in the State of California (9 percent), Canada (16 percent), the Rocky Mountain region of the United States (40 percent), and in the southwest United States (35 percent) (CPUC 2017). In 2012, natural gas was used in California to produce electricity (45.6 percent), in residential uses (21 percent), in industrial uses (25 percent), and in commercial uses (8.6 percent). The total natural gas usage in 2012 was 23,130 million therms (CEC 2016b).

Petroleum Based Fuel

In 2015, 15.1 billion gallons of gasoline (non-diesel) and 1.6 billion gallons of diesel fuel were sold statewide (CEC 2018b). While projected gasoline sales for Solano County (County) were expected to be approximately 210 million gallons in 2016, the number of gallons consumed in the County was 187 million gallons (CEC 2017b). Similar to the number of gasoline gallons consumed, the number of diesel gallons consumed was lower than the California Energy Commission's (CEC) projection. Countywide, 17 million gallons of diesel fuel were consumed in 2016, while the CEC had projected that 18 million gallons of diesel fuel would be consumed countywide (CEC 2017b).

4.11.3 REGULATORY FRAMEWORK

4.11.3.1 Federal Laws and Regulations

Energy Policy and Conservation Act

Enacted in 1975, this legislation established fuel economy standards for new light-duty vehicles sold in the U.S. The law placed responsibility on the National Highway Traffic and Safety Administration (a part of the U.S. Department of Transportation) for establishing and regularly updating vehicle standards. The U.S. Environmental Protection Agency (US EPA) administers the Corporate Average Fuel Economy (CAFE) program, which determines vehicle manufacturers' compliance with existing fuel economy standards. Since the inception of the CAFE program, the average fuel economy for new light-duty vehicles (autos, pickups, vans, and SUVs) steadily increased from 13.1 miles per gallon (mpg) for the 1975 model year to 27.5 mpg for the 2012 model year and is proposed to increase to 54.5 by 2025.

Energy Star Program

In 1992, the U.S. EPA introduced Energy Star as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. The program applies to major

household appliances, lighting, computers, and building components such as windows, doors, roofs, and heating and cooling systems. Under this program, appliances that meet specifications for maximum energy use established under the program are certified to display the Energy Star label. In 1996, US EPA joined with the Energy Department to expand the program, which now also includes qualifying commercial and industrial buildings, and homes.

4.11.3.2 State Laws and Regulations

Title 24

Title 24, Part 6, of the California Code of Regulations contains the CEC's Energy Efficiency Standards for Residential and Nonresidential Buildings. Title 24 was first established in 1978, in response to a legislative mandate to reduce California's energy consumption. Since that time, Title 24 has been updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

On April 23, 2008, the CEC adopted the 2008 standards, which applied to projects that submitted an application for a building permit on or after January 1, 2010. The CEC adopted the 2008 standards for a number of reasons: (1) to provide California with an adequate, reasonably priced, and environmentally sound supply of energy; (2) to respond to Assembly Bill 32 (AB 32; the Global Warming Solutions Act of 2006), which requires California to reduce its greenhouse gas emissions to 1990 levels by 2020; (3) to pursue the statewide policy that energy efficiency is the resource of choice for meeting California's energy needs; (4) to act on the findings of California's Integrated Energy Policy Report, which indicate that the 2008 Standards are the most cost-effective means to achieve energy efficiency, reduce the energy demand associated with water supply, and reduce greenhouse gas emissions; (5) to meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures in the update of all state building codes; and (6) to meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards.¹ In 2013, updates were made to the 2008 Title 24 standards (effective January 1, 2014). The updated 2013 Title 24 standards will be applicable to the project.

The California Green Building Standards Code, which is Part 11 of the Title 24 Building Standards Code, is commonly referred to as the CALGreen Code. The 2008 edition, the first edition of the CALGreen Code, contained only voluntary standards. The 2013 CALGreen Code is a code with mandatory requirements for new residential and nonresidential buildings (including buildings for retail, office, public schools, and hospitals) throughout California beginning on January 1, 2014. The 2013 CALGreen

¹ See <http://www.energy.ca.gov/title24/2008standards/index.html>, 2013.

Code contains requirements for construction site selection, stormwater control during construction, construction solid waste reduction, indoor water use reduction, building material selection, natural resource conservation, site irrigation conservation, and more. Additionally, this code encourages buildings to achieve exemplary performance in the area of energy efficiency. For the purposes of energy efficiency standards, the CEC believes a green building should achieve at least a 15 percent reduction in energy usage when compared to California's mandatory energy efficiency standards. The updated 2016 CALGreen Code became effective January 1, 2017 and includes new requirements for additions to existing residential and non-residential development.

AB 32

In addition to Title 24, AB 32 is anticipated to result in the future regulation of energy resources in California. (See **Section 4.4, Greenhouse Gas Emissions**, for additional information on AB 32.) In order to achieve these emission reductions, it is generally accepted that California will need to improve its overall energy efficiency, which includes the use of more renewable energy resources. Pursuant to AB 32, the California Air Resources Board (CARB) will work with other state agencies (including the CEC), to implement feasible programs and regulations that reduce emissions and improve energy efficiency.²

Senate Bill 32

In the 2016 legislative session, the Legislature passed, and the Governor signed, Senate Bill 32 (SB 32). This bill requires CARB to adopt rules and regulations to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 level by 2030.

Renewable Portfolio Standard

Established in 2002 under SB 1078, accelerated in 2006 under SB 107, and expanded in 2011 under SB 2, California's Renewables Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020.

Senate Bill 350

In the 2015 legislative session, the Legislature passed, and the Governor signed, Senate Bill 350 (SB 350). The legislation requires that, by 2030, 50 percent of all electricity provided by power plants in California

² See <http://www.arb.ca.gov/cc/ghgsectors/ghgsectors.htm#electric>, September 13, 2013 (highlights targeted improvements for the energy sector).

must be from renewable sources. SB 350 further requires the California Energy Commission (CEC) to establish annual targets for statewide energy efficiency savings and demand reduction that would achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas by retail customers by 2030. The bill requires the Public Utilities Commission (PUC) to establish efficiency targets for investor-owned electrical and gas corporations consistent with the 2030 goal, and the CEC to establish annual targets for energy efficiency savings and demand reductions for local publicly-owned electric utilities consistent with the 2030 goal. Each retailer of electricity must regularly file an integrated resource plan (IRP) for review and approval.

Other Energy Related Statutes and Executive Orders

Additional legislation and executive orders focused on energy efficiency in California are highlighted briefly below:

- Senate Bill 107: This legislation, which addresses California's Renewables Portfolio Standard (RPS), requires retail sellers of electricity to procure 20 percent of retail sales from renewable energy by 2010.
- Assembly Bill 1613: This legislation, also known as the Waste Heat and Carbon Emissions Reduction Act, was designed to encourage the development of new combined heat and power systems in California with a generating capacity of up to 20 megawatts (MW).
- Senate Bill 1: This legislation enacted the Governor's Million Solar Roofs program and has an overall objective of installing 3,000 MW of solar photovoltaic systems.
- Senate Bill 1389: This legislation requires the California Energy Commission to prepare a biennial integrated energy policy report that contains an assessment of major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety.
- Executive Order S-14-08: This order established accelerated RPS targets—specifically 33 percent by 2020.
- Executive Order S-21-09: This order requires CARB to adopt regulations, by July 31, 2010, increasing California's RPS to 33 percent by 2020.

4.11.3.3 Local Plans and Policies

City of Fairfield General Plan

The following presents guiding and implementing policies from the City of Fairfield General Plan relevant to energy.

Objective PF 1: Provide superior levels of facilities and services prior to or concurrent with planned development (see Objective LU 4).

Policy PF 1.1: New development shall be phased according to the capacity of public facilities and services to serve new development (see Policy LU 4.2).

Objective PF 2: New development shall pay such fees and taxes as necessary to meet all identified costs associated with that development (see Policy ED 7.4).

Policy PF 2.1: New development shall be responsible for the public costs attached to each development project, which include, but are not limited to, the acquisition of permanent open space, the provision of adequate school facilities, and the provision of streets, street lighting, sidewalks, landscaping, storm drains, and other infrastructure needs.

Policy PF 2.2: New development shall be responsible for paying a financial contribution to mitigate the effect of the development on the provision of such public services as police and fire protection, public education, water, and sewer.

Objective PF 4: Provide an adequate supply of quality water to support the General Plan level of development.

Policy PF 2.3: Construction permits shall not be granted until the developer provides for the installation and/or financing of needed public facilities.

Policy PF 4.3: The City shall acquire water supplies to serve all foreseeable needs in the General Plan with a minimum 90 percent reliability (e.g. water supplies may be deficient in no more than 10 percent of the years).

Policy PF 4.8: New development shall include water conservation features and drought resistant landscaping.

Objective PF 8 Provide a flood control and drainage system that serves the General Plan level of development in a planned and orderly manner, minimizes flood-related hazards, and protects natural resources. (See Objective HS 3)

Policy PF 8.1: The City shall condition approval of new development projects on the provision of adequate storm drainage improvements.

Objective PF 9 Maintain flood control and drainage facilities to preserve their function and capacity.

Policy PF 9.2: Continue to require new development to discharge storm runoff at volumes no greater than the capacity of any portion of the existing downstream system by utilizing detention or retention or other approved methods, unless the project is providing drainage pursuant to an adopted drainage plan.

Policy PF 9.3: All drainage improvements shall comply with the City of Fairfield Standard Specifications and Details, Engineering Design Standards.

Objective PF 12: Provide adequate public utilities.

Policy PF 12.2: The City shall continue to circulate development proposals to local utility providers, including Pacific Gas and Electric, Pacific Bell, and local cable television providers, for their review and comment and to ensure that they can and will provide service to development.

Policy PF 13.1: Reduce the amount of waste disposed of at the landfill by reducing 25 percent of the solid waste stream by the year 1995 and 50 percent by the year 2000 as mandated by State law.

Objective PF 17: Assist in the adequate provision of County services.

Policy PF 17.1: Continue to collect fees from new development to fund its share of County provided facilities and services (e.g. library, health, welfare, and justice system).

4.11.4 IMPACTS AND MITIGATION MEASURES

4.11.4.1 Significance Criteria

In accordance with Appendix G of the *State CEQA Guidelines*, impacts related to energy consumption resulting from the implementation of the proposed project would be considered significant if the project would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or

- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.11.4.2 Methodology

Appendix G of the *State CEQA Guidelines* requires consideration of the potentially significant energy implications of a project. CEQA requires mitigation measures to reduce “wasteful, inefficient and unnecessary” energy usage (Public Resources Code Section 21100, subdivision [b][3]). According to Appendix G, the means to achieve the goal of conserving energy include decreasing overall energy consumption, decreasing reliance on natural gas and oil, and increasing reliance on renewable energy sources. In particular, the proposed project would be considered “wasteful, inefficient, and unnecessary” if it were to (1) violate state and federal energy standards, (2) result in significant adverse impacts related to project energy requirements, energy inefficiencies, or energy intensiveness of materials, (3) cause significant impacts on local and regional energy supplies or generate requirements for additional capacity, (4) fail to comply with existing energy standards, or (5) otherwise result in significant adverse impacts on energy resources, or conflict or create an inconsistency with applicable plan, policy, or regulation.

The methodology used to estimate the construction-phase energy use is described in **Impact EN-1** below. With respect to energy consumption during occupancy/operation, the increased electricity and natural gas demand estimates due to operation/occupancy of the proposed project were developed using the CalEEMod emissions model, which is a state-approved emissions model used to estimate air quality emissions from land use development projects. In addition to modeling emissions, CalEEMod provides an estimation of annual electricity, natural gas, and water use. In addition, as the proposed project would result in daily vehicle trips to and from the project site due to typical residential commutes, the increase in the consumption of petroleum-based fuel was calculated for the proposed project based on vehicle miles travelled (VMT). CalEEMod was used to estimate VMT for the proposed project. Energy consumption during occupancy/operation is presented in **Impact EN-1** and **Impact EN-2** below.

4.11.4.3 Project Impacts and Mitigation Measures

Impact EN-1: **Construction and operation of the proposed project would increase the consumption of energy but would not result in wasteful, inefficient or unnecessary consumption of energy. (*Less than Significant*)**

The proposed project is a mixed-use development with 270 apartment units, composed of four 4-story apartment buildings, parking, a clubhouse with pool, and recreation areas. The commercial complex would consist of four buildings with approximately 22,600 square feet of space, parking, and associated site improvements. The apartment units would range in size from 635 square feet to 1,248 square feet,

with a mix of 34 studio units, 134 one-bedroom units, and 102 two-bedroom units. The proposed project uses would not have a high or wasteful demand for energy. The four commercial structures would range in size from 5,675 square feet to 5,839 square feet. The amount of energy used at the residential uses within the project site would directly correlate to the number and size of residential units, the energy consumption of associated unit appliances, garage usage, and outdoor lighting, landscape maintenance, pool, and other energy uses associated with project site activities. The amount of energy used at the commercial structures is mainly associated with lighting. Other proposed project energy uses include fuel used by vehicle trips generated by the project during its construction and operation, and fuel used by off-road construction vehicles during construction. The following analysis provides calculated levels of energy use expected for the proposed project, based on CalEEMod v.2016.3.2 (see Appendix 4.1 for CalEEMod outputs and model input details).³

Construction Energy Use

Project construction would require some site preparation, grading, utility installation, foundation construction, building construction and painting, paving, and landscaping installation. All construction would be typical for the region and building type. During construction of the proposed project, energy would be consumed in the form of petroleum-based fuels used to power off-road construction vehicles and equipment on the project site, construction worker travel to and from the project site, as well as delivery truck trips; and to operate generators to provide temporary power for lighting and electronic equipment. The manufacture of construction materials used by the proposed project would also involve energy use. Due to the large number of materials and manufacturers involved in the production of construction materials (including manufacturers in other states and countries), upstream energy use cannot be reasonably estimated. However, it is reasonable to assume that manufacturers of building materials such as concrete, steel, etc., would employ all reasonable energy conservation practices in the interest of minimizing the cost of doing business. Furthermore, neither the City nor the applicant has control over or the ability to influence energy resource use by the manufacturers of construction materials. Therefore, this analysis does not evaluate upstream energy use.

The total consumption of gasoline and diesel fuel during project construction was estimated using the same assumptions and factors from CalEEMod that were used in estimating construction air emissions in **Section 4.1, Air Quality**. As shown in **Table 4.11-1, Off-Road Construction Equipment Diesel Fuel Consumption**, and **Table 4.11-2, Construction Petroleum Fuel Consumption**, a total of approximately

³ Many of the assumptions provided by CalEEMod are conservative relative to the proposed project. Therefore, this analysis provides conservative estimate of proposed project energy usage.

90,662 gallons of diesel fuel (combined off-road and vendor trips), and 54,116 gallons of gasoline would be consumed over the project's 18 month construction horizon.

**Table 4.11-1
Off-Road Construction Equipment Diesel Fuel Consumption**

Phase	Equipment Type	Units	Hours	Horse Power	Load Factor	Number of Days	Fuel Usage (HP/hr)	Diesel Usage (in gallons)
Site Preparation	Rubber Tired Dozers	3	8	247	0.40	14	0.05	1,660
	Tractors/Loaders/Backhoes	4	8	97	0.37	14	0.05	804
Grading	Excavators	2	8	158	0.38	42	0.05	2,017
	Graders	1	8	187	0.41	42	0.05	1,288
	Rubber Tired Dozers	1	8	247	0.40	42	0.05	1,660
	Scrappers	2	8	367	0.48	42	0.05	5,919
	Tractors/Loaders/Backhoes	2	8	97	0.37	42	0.05	1,206
Construction	Cranes	1	7	231	0.29	420	0.05	9,848
	Forklifts	3	8	89	0.20	420	0.05	8,971
	Generator Sets	1	8	84	0.74	420	0.05	10,443
	Tractors/Loaders/Backhoes	3	7	97	0.37	420	0.05	15,827
	Welders	1	8	46	0.45	420	0.05	3,478
Paving	Pavers	2	8	130	0.42	28	0.05	1,223
	Paving Equipment	2	8	132	0.36	28	0.05	1,064
	Rollers	2	8	80	0.38	28	0.05	681
Coatings	Air Compressors	1	6	78	0.48	28	0.05	314
Total Diesel Usage								66,404

Source: CalEEMod Model Data; Impact Sciences 2019

**Table 4.11-2
Construction Petroleum Fuel Consumption**

Phase	Number of Daily Trips	Number of Days	Average Round-Trip Commute Distance (in miles)	Fuel Usage (mpg) ^a	Gasoline/Diesel Usage (in gallons)
Worker Trips (Gasoline)					
Site Preparation	18	10	10.8	18.6	105
Grading	20	30	10.8	18.6	348
Construction	303	300	10.8	18.6	52,781

Phase	Number of Daily Trips	Number of Days	Average Round-Trip Commute Distance (in miles)	Fuel Usage (mpg) ^a	Gasoline/Diesel Usage (in gallons)
Paving	15	20	10.8	18.6	174
Coatings	61	20	10.8	18.6	708
Total Gasoline Usage					54,116
Vendor Trips (Diesel)					
Construction	72	300	7.3	6.5 ^b	24,258
Total Diesel Usage					24,258

Source: CalEEMod Model Data; Impact Sciences 2019

Notes:

mpg – miles per gallon

^a This is a conservatively estimated total, as it assumes no electric, hybrid or other alternate fuel use vehicles in the fleet mix.

^b Rentar Environmental Solutions, Inc. 2017. Here Are The Diesel Truck Miles Per Gallon (MPG). Available online at: <https://rentar.com/diesel-truck-miles-per-gallon-mpg/>, accessed August 22, 2018.

The estimated amounts of energy resources reported in **Tables 4.11-1** and **4.11-2** would be consumed over a period of 24 months and would represent a small percentage of the total energy used in the state. More importantly, for reasons presented below, this consumption would not represent a wasteful and inefficient use of energy resources.

There is growing recognition among developers and retailers that sustainable construction is not any more expensive than “business as usual” construction methods, and further, that there are long-term significant cost-savings potential in utilizing green building practices and materials. In addition, the proposed project would feature a sustainable design to comply with CALGreen, which would also result in the use of sustainable materials and recycled content that would reduce energy consumption during project construction.

Further, all grading (cut and fill) would be balanced on-site, eliminating the need for any haul trucks to remove or supply soil to the project site. Construction materials would include recycled materials and products originating from nearby sources to the extent feasible in order to comply with CALGreen and to reduce costs of transportation.

CARB has adopted an Airborne Toxic Control Measure (ATCM) to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants. This measure prohibits diesel-fueled commercial vehicles greater than 10,000 pounds from idling for more than 5 minutes at any given time. To ensure compliance with this ATCM, **Mitigation Measure AIR-1** is included in **Section 4.1, Air Quality**, which requires that during construction, idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes. It also requires that all construction equipment shall be maintained and properly tuned in

accordance with manufacturer's specifications, and that all equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. **Mitigation Measure AIR-3** requires that construction equipment be selected to minimize emissions (i.e., meet Tier 4 engine standards), and that all diesel-powered off-road equipment larger than 50 horsepower and operating on the site for more than two days continuously shall, at a minimum, meet US EPA particulate matter emissions standards for Tier 4 engines or equivalent. Idling restrictions and the use of newer engines and properly maintained equipment would result in less fuel combustion and energy consumption. Furthermore, contractors and owners have a strong financial incentive to avoid wasteful, inefficient, and unnecessary consumption of energy during construction.

For the reasons listed above, the proposed project would not involve the inefficient, wasteful, and unnecessary use of energy during construction and the construction-phase impact related to energy consumption would be less than significant.

Operational Energy Use

The proposed project would use energy resources for the operation of project buildings (electricity and natural gas) and for on-road vehicle trips (gasoline and diesel fuel) generated by the proposed project. As required by the previously discussed state regulations, the proposed project would be responsible for conserving energy, to the extent feasible, and relies heavily on reducing per capita energy consumption to achieve this goal, including through Statewide and local measures.

Electricity and Natural Gas

Electricity and natural gas would be used primarily for residential housing end uses. Total annual electricity (kWh) and natural gas (kBtu) usage associated with the operation of the proposed project is shown in **Table 4.11-3, Project Operational Natural Gas and Electricity Usage** below (as provided by CalEEMod). The proposed project incorporates the measures such as meeting or exceeding Title 24 energy requirements for all buildings and Low-E windows for residential units to reduce the proposed project's operational electricity and natural gas consumption (See **Chapter 3.0, Project Description** for comprehensive list).

As shown in **Table 4.11-3**, proposed project operational energy usage would represent less than 0.02 percent of the 2016 countywide annual electricity demand (approximately 7,435 GWh), and less than 0.03 percent of the 2016 countywide annual natural gas consumption (approximately 25,370,819,544 MBtu/year).

**Table 4.11-3
Project Operational Natural Gas and Electricity Usage**

Energy^(a)	Natural Gas (kBtu/year)	Electricity (kWh/year)
Apartments Mid Rise	2,332,650	1,114,650
Retail Shopping Center	53,586	241,701
Parking Lot	--	82,740
Total	2,386,236	1,439,091

Source: CalEEMod Model Data; Impact Sciences 2019

Note: (a) Numbers provided here may not add up exactly to total due to rounding.

Petroleum-Based Fuel

The proposed project would result in the consumption of petroleum-fuel related to vehicular travel (quantified as vehicle miles travelled (VMT) to and from the project site. **Table 4.11-4, Estimated Petroleum-based Fuel Usage at Buildout**, below, presents the projected consumption of approximately 190,962 gallons of diesel and 335,278 gallons of gasoline per year, or a total of 526,240 gallons of petroleum-based fuels per year based on an annual estimate of 7,477,414 VMT⁴ obtained from the CalEEMod results for the proposed project.

This is a conservative estimate, given that it assumes no electric, hybrid, or other alternate fuel use vehicles in the fleet mix. Furthermore, this level of annual consumption is based on fuel efficiency rates (miles per gallon) shown in **Table 4.11-4**. It is anticipated that Federal and state laws and regulations will continue to require further improvements in fuel efficiency in motor vehicles produced and/or sold in the US and so the total annual consumption of petroleum-based fuel is expected to decrease over time.

California consumed a total of 15.1 billion gallons of gasoline (non-diesel) and 1.6 billion gallons of diesel fuel in the year 2015 (CEC 2018b). As shown in **Table 4.11-4** below, residents of the proposed project would use approximately 335,278 gallons of gasoline and 190,962 gallons of diesel. This would represent approximately 0.18 percent of the countywide annual gasoline consumption and approximately 0.29 percent of the countywide annual diesel consumption. As the question posed by the significance criteria is whether the use of this energy is inefficient or wasteful, it is notable that the GHG evaluation in **Section 4.4** shows that the project's total emissions from all energy use, including petroleum-based fuel use, will not exceed the BAAQMD threshold. The analysis in **Section 4.4** shows that the project's GHG emissions are driven by the use of energy in vehicles, with almost 92 percent of emissions from petroleum-based

⁴ CalEEMod default trip lengths were used which is an average trip length of approximately 7.37 miles.

fuel use. The GHG analysis concludes that the project emissions will be below the established threshold, which supports a conclusion that the project's use of energy will not be wasteful or inefficient.

**Table 4.11-4
Estimated Petroleum-based Fuel Usage at Project Buildout**

Source	Fleet Mix ^a	Generation Factor ^{b, c}	Annual Consumption (in gallons)
Mobile			
Diesel (gallons)	16.6%	7,477,414/6.5 mpg	190,962
Gasoline (gallons)	83.4%	7,477,414/18.6 mpg	335,278
		Total	526,240

Source: CalEEMod Model Data; Impact Sciences 2019

Notes:

mpg = miles per gallon

a Data Source: FHWA OHPI, Highway Statistics, Fuel Consumption by State and Type

<http://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/chapter5.cfm>

b Data Source: California Department of Transportation, 2007 California Motor Vehicle Stock, Travel and Fuel Forecast,

<http://www.energy.ca.gov/2008publications/CALTRANS-1000-2008-036/CALTRANS-1000-2008-036.PDF>

c Diesel-powered vehicles typically get 30-35% more miles per gallon than comparable vehicles powered by gasoline. US Department of Energy, Fuel Economy Guide, <http://www.fueleconomy.gov/feg/pdfs/guides/FEG2013.pdf>

For the reasons listed above, the proposed project would not involve the inefficient, wasteful, and unnecessary use of energy during operation and the operation-phase energy impact would be less than significant.

Mitigation Measures: No mitigation measures are required.

Impact EN-2: The proposed project would not conflict with or obstruct state or local plans for renewable energy or energy efficiency. (*Less than Significant*)

Construction

Electricity and natural gas from the PG&E supply and distribution systems would not be used during project construction, and there would be no impact on the existing supply and distribution systems.

Operation

As stated above, the proposed project's annual natural gas and electricity demand would represent very small percentages of the 2015 statewide annual natural gas and electricity consumption. Given the small

fraction that the project's demand would constitute of the total demand, the project's demand by itself would not require the construction of new power generation facilities. The electrical loads and natural gas demand associated with the proposed project are within the parameters of projected load growth in the County, and PG&E maintains sufficient capacity to serve the proposed project. The proposed project would comply with all existing energy standards, including those established by the City of Fairfield, and would not result in significant adverse impacts on energy resources. Thus, the proposed project would not be expected to cause an inefficient, wasteful, or unnecessary use of energy resources and the operation of the proposed project would not result in the consumption of energy resources that could not be accommodated within the long-term electricity and natural gas supply and distribution system of PG&E. The project's impact on supply and distribution systems would be less than significant.

Although the project demand for electricity by itself would not require the construction of new power generation facilities, the increase in demand, combined with the demand for electricity associated with past, present and reasonably foreseeable future projects in the region, could contribute to the need for an expansion of an existing power plant or the construction of a new power plant. PG&E produces some of the electricity it sells and purchases the rest from other producers; the procured electricity could come from in-state or out of state generation facilities. It is, therefore, infeasible and speculative to predict where the new supply sources would be located or to evaluate the environmental consequences from the construction and operation of such facilities. Furthermore, if the new power generation facilities were to be located in California, they would be subject to environmental review and would be required to avoid or minimize their environmental impacts.

Mitigation Measures: No mitigation measures are required.

4.11.5 ALTERNATIVES

Appendix F, Section II.E., of the *State CEQA Guidelines* recommends that alternatives should be compared in terms of overall energy consumption and in terms of measures to reduce energy use. The energy use and impacts of alternatives to the proposed project are presented in **Section 5.0, Alternatives**, of this Draft EIR. The alternatives evaluated in **Section 5.0** include alternatives that would involve lower energy use than the proposed project.

4.11.6 UNAVOIDABLE ADVERSE EFFECTS

Appendix F, Section II.F., recommends that the EIR report any unavoidable adverse impacts associated with the project's energy use. The analysis presented in **Impact EN-1** and **Impact EN-2** above shows that there would not be a significant unavoidable impact associated with the use of energy by the project.

4.11.7 IRREVERSIBLE COMMITMENT OF RESOURCES

Appendix F, Section II.G., states that an irreversible commitment of resources could occur if the project preempts future energy development or future energy conservation. The proposed project is a mixed-use development that would not preempt future energy development on the project site since there are no energy resources located on or near the site. The proposed project would also not preempt future energy conservation, because similar to other residential units in the City, the apartment buildings would be able to implement energy related improvements in the future, including solar panels and electric vehicle charging stations.

4.11.8 SHORT-TERM GAINS AND LONG-TERM IMPACTS

Appendix F, Section II.H., suggests that the project's short-term gains and long-term impacts can be evaluated by calculating the project's energy cost over the project's lifetime. As noted above, the proposed project would not result in a wasteful use of energy. The project would provide housing that is needed to meet the City's housing needs and commercial space needed to serve the City's residents. There would not be a reduction of long-term benefits for short-term gains as a result of the proposed project.

4.11.9 GROWTH INDUCING EFFECTS

Appendix F, Section II.I., states that growth inducing effects may include the energy consumption of the growth induced by the project. As stated in **Section 6.0, Other CEQA Considerations**, other than the residents of the project site that would be added to the population of the City, the proposed project would not induce any population or employment growth beyond that anticipated in the General Plan. The employees that would work at the commercial development would likely be an existing resident of the City. Therefore there would be no energy consumption related to growth induced by the proposed project.

4.11.10 REFERENCES

- California Energy Commission (CEC). 2016a. Electricity Consumption by County. Available at: <http://www.ecdms.energy.ca.gov/elecbycounty.aspx>, accessed August 22, 2018.
- CEC. 2016b. Gas Consumption by County. Available at: <http://www.ecdms.energy.ca.gov/gasbycounty.aspx>, accessed August 22, 2018.
- CEC. 2017a. *2015 Total System Electric Generation in Gigawatt Hours*. Available at: http://www.energy.ca.gov/almanac/electricity_data/total_system_power.html, accessed August 22, 2018.
- CEC. 2017b. 2016 California Annual Retail Fuel Outlet Report Results. Available at: http://www.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html, accessed August 22, 2018.
- CEC. 2018a. *2016 Total System Electric Generation in Gigawatt Hours*. Available at: http://www.energy.ca.gov/almanac/electricity_data/total_system_power.html, accessed August 22, 2018.
- CEC. 2018b. California Gasoline Data, Facts, and Statistics. Available online at: http://www.energy.ca.gov/almanac/transportation_data/gasoline/, accessed August 22, 2018.
- California Public Utilities Commission (CPUC). 2017. *Natural Gas and California*. Available at: http://www.cpuc.ca.gov/natural_gas/. Accessed June 26, 2017.