MEMORANDUM

DATE: February 3, 2021

TO: Chris Bowen, GF Investments LLC.

FROM: Michael Hendrix, Associate-Air Quality and Climate Change, LSA

SUBJECT: Preliminary Energy Analysis Associated with the Proposed Skyline Village Mixed Use Development, Corona California (LSA Project No. GFI2001)

This technical memorandum has been prepared to evaluate the energy and fuel use impacts associated with the proposed Skyline Village Mixed Use Development located on the west side of the intersection of Foothill Parkway and Chase Drive in Corona, California. This analysis evaluates project-specific energy and fuel use by examining the impacts of the proposed project on regional energy use. Mitigation measures required to reduce criteria air pollutants and greenhouse gas (GHG) emissions would also reduce electricity and petroleum consumption.

EXISTING CONDITIONS

The proposed project site is 17.02 acres and is currently vacant on undeveloped land on the west side of the intersection of Foothill Parkway and Chase Drive. Adjacent land uses include single-family residential to the north and east of the project site. Immediately south and west of the project site are vacant, agricultural and open space land.

PROJECT DESCRIPTION

The proposed project would develop 39 one-bedroom residential condominiums, 39 three-bedroom townhomes, 1400 sf recreation center with a swimming pool, retail shops and restaurants totaling 25,900 gross square feet, parking and ancillary uses. The mix of on-site land uses would be interconnected with pedestrian and bicycle pathways.

PROJECT ENERGY SUPPLY

Southern California Edison (SCE) provides electricity and Southern California Gas (SCG) provides natural gas for the City of Corona including the Proposed Project site. These utilities will extend into the project site from existing local distribution systems at the site boundaries. An existing SCE electrical transmission easement traverses north to south along the easterly boundary of the project site. New electric and natural gas facilities will be installed in joint utility trenches within the public street rights-of-way as required by the City and energy provider. In conjunction with gas and electric facilities, telephone and cable television/internet facilities also will be constructed.

ENERGY CONSUMPTION IN CALIFORNIA AND RIVERSIDE COUNTY

The following statistics have been provided by CEC (CEC 2018b) and are current through 2017.

Electricity

Fueled by population growth, the demand for electricity in California is increasing. At the same time, the mandate to decrease GHG emissions will only increase in the future. California's electricity mix is generated by natural gas (34.23 percent); coal (2.96 percent); large hydroelectric (14.62 percent); nuclear (8.98 percent); renewable (31.70 percent): and unspecified power purchases (7.34 percent) in 2019.

In 2019, California produced 71 percent of the electricity it consumed; the rest was imported from the Pacific Northwest (14 percent) and the United States Desert Southwest (16 percent). Natural gas is the main source for electricity, contributing 34 percent of the total system power. According to the United States Department of Energy (DOE), Energy Information Administration (EIA) *Annual Electric Power Industry Report* (EIA 2020), Californians spent almost $41 billion for their electricity in 2019. Table A shows the total electricity consumed in Riverside County for 2019.

Table A: Annual Electricity Consumption in Riverside County (2019)

Type of Consumer	Millions of Kilowatt-Hours[1]
Residential	7,337
Non-Residential	8,183
Total	**15,520**

Source: California Energy Commission. Energy Consumption Data Management System (2020).
[1] A kilowatt-hour is a unit of power equal to 1,000 watts of electricity consumed in 1 hour.

Natural Gas

Electricity generation has the largest consumption of natural gas, consuming approximately half of all natural gas in the State. The residential sector uses 33 percent of the available natural gas. Of that amount, 88 percent is used for space and water heating. Table B shows the total natural gas consumption in San Diego County for 2017.

Table B: Annual Natural Gas Consumption in Riverside County (2019)

Land Use	Millions of Therms[1]
Residential	305
Non-Residential	148
Total	**453**

Source: California Energy Commission. Energy Consumption Data Management System (2020).
[1] A therm is a unit of heat containing 100,000 British thermal units (Btu).

Liquid Petroleum Gas (Propane)

Liquefied petroleum gas (LPG) is a mixture of gaseous hydrocarbons, mainly propane and butane that change into liquid form under moderate pressure. LPG (usually called propane) is commonly used as a fuel for rural homes for space and water heating, as a fuel for barbecues and recreational vehicles, and as a transportation fuel. It is normally created as a by-product of petroleum refining and from natural gas production.

LPG is generally an unregulated fuel in California (except for storage and safety issues, which are regulated), because it is an unregulated commodity, the State does not collect data on LPG sales or

usage. The statistics for LPG in the Alternatives to Traditional Transportation Fuels section below were provided by the DOE, EIA, Office of Coal, Nuclear, Electric, and Alternate Fuels. As such, statistics are unavailable for LPG as a fuel for rural homes, for space and water heating, or for barbecues, and therefore not included in this section.

Traditional Transportation Fuels (Fossil Fuels)

Fossil fuels are energy resources that come from the remains of plants and animals that are millions of years old. The three fossil fuels—petroleum oil, natural gas and coal—are overwhelmingly responsible for providing the energy that powers our lifestyles and economy, and fuels our transportation systems. They are the bedrock we base our energy mix on, but they are a limited resource. Once they are consumed, they will no longer be part of our energy mix.

There are public concerns associated with the use of fossil fuels. In addition to their unsustainability, fossil fuels are linked to various negative environmental impacts. The burning of fossil fuels is responsible for emissions that contribute to global climate change, acid rain, ozone problems, and unhealthy air. The research and development of alternatives to traditional transportation fuels is required to improve sustainability and reduce impacts of fossil fuel consumption.

In 2019, approximately 143,000,000 gallons of gasoline and 16,548,956 gallons of diesel were consumed in Riverside County (CEC).

Alternatives to Traditional Transportation Fuels

Alternatives to traditional transportation fuels are being developed and introduced into the consumer marketplace. Alternative fuels currently in use in the United States include:

- Compressed natural gas;
- Electric;
- Ethanol, 85 percent;
- Hydrogen;
- Liquefied Natural Gas (LNG); and
- LPG.

The following information was prepared by the EIA, the independent statistical and analytical agency within the DOE. Each year, the EIA collects data on the number of alternative fuel vehicles (AFVs) supplied, and for a limited set of fleet user groups, the number of AFVs in use and the amount of alternative transportation fuel consumed. The user groups surveyed are federal and State governments, alternative fuel providers, and transit companies.

Alternative Fuel Vehicles in Use

An estimated 2,497,432 AFVs were in use in the United States in the year 2019, with 610,723 in use in California (Table C).

Table C: Alternative Fuel Vehicles In Use by Fuel Type (2019)

Fuel Type	United States	California
Compressed Natural Gas	175,000	163,160
Electric	1,400,000	256,800
Ethanol, 85%	388,432	31,862
Hydrogen	8,000	7,850
Liquefied Natural Gas	379,000	150,000
Liquefied Petroleum Gas	147,000	1,051
Total	**2,497,432**	**610,723**

Source: Energy Information Administration. Alternative Fuels Data Center. Website: http://www.eia.gov/renewable/afv/users.cfm?fs=a (accessed January 2021).

Alternative Fuel Consumption

The estimated consumption of alternative fuels (in thousand gasoline-equivalent gallons) in California during the year 2019 is shown in Table D.

Table D: Estimated Consumption of Alternative Fuels in California by Fuel Type (2019) (thousand gasoline-equivalent gallons)

CNG	Electric	E85	Hydrogen	LNG	LPG	Total
1,438,742	15,773	1,528	20,648	1,584,259	1,341	3,062,291

Source: Energy Information Administration. Alternative Fuels Data Center. Website: http://www.eia.gov/renewable/afv/users.cfm?fs=a (accessed April 2019).

CNG = compressed natural gas
E85 = Ethanol, 85%
LNG = liquefied natural gas
LPG = liquefied petroleum gas

THRESHOLDS OF SIGNIFICANCE

State CEQA Guidelines Section 15064(b)(1) provides that the "determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data," and further states that an "ironclad definition of significant effect is not always possible because the significance of an activity may vary with the setting."

A project would normally have a significant energy effect on the environment if it 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.

PROJECT ENERGY DEMAND AND GENERATION

TEMPORARY ENERGY DEMAND

Construction of the project would require temporary energy demand. Construction energy impacts involve the one-time, non-recoverable energy costs associated with construction of structures and roadways. Construction of the project would require the use of off-road construction equipment and on-road vehicles for worker commuting, and vendors.

The project construction would last approximately one year. For modeling purposes, the analysis assumed that initial grading and earthwork would result in the highest fuel use during the construction period.

All construction equipment was assumed to be powered by diesel and the fuel consumption was calculated based on the equation:

$$\text{Fuel Consumption} = \text{Horsepower} \times \text{Load Factor} \times \text{Specific Fuel Consumption}$$

For the analysis, the specific fuel consumption was assumed as 0.22 kilogram per kilowatt hour for diesel engine (Klanfar et al. 2016). Table E shows the daily fuel and energy consumption estimated for construction of the proposed project. U

Fuel Consumption (gallons/day)	Energy Consumption (MMBtu/day)
1,536	211

Total construction related on-road fuel use is small (approximately 0.03 percent of State-wide transportation fuel consumption) and would only last for a short period of time during project construction. Therefore, construction of the proposed project would not cause a significant temporary energy impact during construction.

PERMANENT ENERGY DEMAND AND GENERATION

The California Emissions Estimator Model (CalEEMod), Version 2016.3.2 was used to estimate electricity and natural gas consumption and renewable energy generation during the operation of the proposed project. Mitigation measures required to reduce criteria air pollutants and greenhouse gas emissions would also reduce electricity consumption. The petroleum consumption from project-related on-road transportation was calculated from VMT and fuel efficiency from EMFAC2017 (ARB 2018). The Transportation Demand Management (TDM) measures identified in the *Traffic Impact Analysis* and Statewide EV ownership projection would reduce petroleum consumption.

Electricity

Table G shows the annual electricity consumption of the proposed project and the percent of the County's total electricity consumption of 15,520 million kWh in 2019 (Table A) at full buildout. The annual electricity consumption of the proposed project is higher that defaults within the CalEEMod model due to the electricity consumption by Electric Vehicles (EVs). However, Title 24 also requires onsite renewable electricity generation and additional efficiency that offsets the higher electricity

consumption of the project. The regional electricity consumption is available at County level. As shown in Table G, the proposed project would consume less than 0.2 percent of the County's total electricity consumption. The U.S. Census Bureau reported that in 2019, the total population in Riverside County was 2,471,000 (U.S. Census Bureau 2020). The proposed project is anticipated to generate a service population of approximately 268 people which is equivalent to approximately 0.011% percent of the County's total population but will consume approximately 0.0011 percent of electricity consumption when onsite renewable generation is included. Therefore, the project's electricity consumption per person would be less than the County per capita average, and would not result in significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources.

Table G: Annual Electricity Consumption of the Proposed Project

Scenario		Annual KWh/Percent of Consumption
Buildout	**Project Electricity Consumption (kWh)**	**166,283**
	Percent of County 2019 Consumption	**0.0011**

Source: CalEEMod 2016.3.2. Compiled by LSA (December 2020).
Note: Total kWh for project is increased by 5% to account for EV charging, reduced by 15% to account for Title 24 energy efficiency measures, and reduced by an additional 63% to account for renewable energy requirments.
Average fuel efficiency of electric vehicle is 35 kWh per 100 miles.
kWh = kilowatt hours

Natural Gas

Table H shows the annual natural gas consumption of the proposed project and the percent of the County's total natural gas consumption of the 453 million therms (45,300,000 MMBtu) in 2019 (Table B) at full buildout.

Table H: Annual Natural Gas Consumption of the Proposed Project

Scenario		MMBtu/Percent of Consumption
Buildout	Project Natural Gas Consumption (MMBtu)	13.25
	Percent of County 2019 Consumption	0.0029

Source: CalEEMod 2016.3.2. Compiled by LSA (May 2020).
kWh = kilowatt hours
EV = electric vehicle

At full buildout, the proposed project would result in an annual natural gas consumption of approximately 13.25 MMBtu, which is equivalent to approximately 0.002 percent of the County's total natural gas consumption. The regional natural gas consumption is available at County level. The proposed project would consume less than 0.002 percent of the County's total natural gas consumption and the proposed project would generate a population of approximately 0.011 percent of the County's total population, the project's natural gas consumption per person would be less than the County per capita average. Therefore, the project would not result in significant environmental impacts due to wasteful, inefficient, or unnecessary consumption of energy resources.

Petroleum

Based on the VMT provided in the *Transportation Impact Analysis (TIA)*, the project would generate 5,618 miles per day and 1,460,596 miles per year. The TDM measures identified in the TIA and detailed in the Energy and Transportation Mitigation Measures section would reduce VMT by approximately 15 percent. Based on California Department of Motor Vehicles registration statistics and projections based on EO B-16-12, approximately 13 percent of passenger vehicles in California will be EVs by 2035 (California Department of Motor Vehicles 2015a, 2015b).

The average fuel efficiencies for this analysis were obtained from EMFAC2017. Table H shows the annual petroleum demand at full buildout of the proposed project before and after mitigation measures under the Preferred Land Use Plan with School and Land Use Plan without School, respectively. The regional petroleum consumption is available at State level. As shown in Table H, the proposed project would consume approximately 0.0003 percent of the County's annual petroleum consumption. The U.S. Census Bureau reported that in 2019, the total population in Riverside County was 2,471,000 (U.S. Census Bureau 2019). The proposed project is anticipated to generate a service population of approximately 1,116 which is equivalent to approximately 0.045 percent of the County's total population. Therefore, the project's petroleum consumption per person would be less than the County per capita average, and would not result in significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources.

Table H: Annual Petroleum Demand of the Proposed Project

Scenario		Gallons fuel/MMBtu/Percent of consumption
Buildout	Gasoline (gallons)[1]	36,977
	Diesel (gallons)[2]	7017
	Energy (MMBtu)	5,411
	Percent of State 2019 Consumption	0.0003

Source: EMFAC2017. Compiled by LSA (May 2020).
Note: [1] One gallon of gasoline is equivalent to 120,476 Btu.
[2] One gallon of diesel is equivalent to 137,452 Btu.
MMBtu = million British Thermal Units

ENERGY PLAN CONSISTENCY

In 2002, the Legislature passed SB 1389, which required the CEC to develop an integrated energy plan every 2 years for electricity, natural gas, and transportation fuels, for the California Energy Policy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero-emission vehicles and their infrastructure needs, and encouragement of urban designs that reduce VMT and accommodate pedestrian and bicycle access.

The CEC recently adopted the 2019 Integrated Energy Policy Report (CEC 2019). The 2019 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs. The 2019 Integrated Energy Policy Report covers a broad range of topics, including implementation of SB 100, integrated resource planning, distributed energy resources, transportation electrification, solutions to increase resiliency in the electricity sector, energy efficiency, transportation electrification, barriers faced by disadvantaged communities, demand response, transmission, and landscape-scale planning, the California Energy Demand Preliminary Forecast, the preliminary transportation energy demand forecast, renewable gas (in response to SB 1383), updates on Southern California's electricity reliability, natural gas outlook, and climate adaptation and resiliency.

As indicated above, energy usage on the project site during construction would be temporary in nature. In addition, onsite renewable energy generation combined with all electric homes significantly reduces the energy usage associated with operation of the proposed project and would be relatively small in comparison to the State's and County's available energy sources and energy impacts would be negligible at the regional level. Because California's energy conservation planning actions are conducted at a regional level, and because the project's per capita energy consumption is less than the regional (State or County) level, the proposed project would not conflict with California's energy conservation plans as described in the CEC's 2019 Integrated Energy Policy Report. Therefore, the proposed project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency, and no mitigation measures would be necessary.

CONCLUSIONS

Temporary and permanent energy and fuel use associated with the proposed project would be below the thresholds of significance. Therefore, impacts related to energy and fuel use consumption would all result in a less than significant impact.

If you have any questions, or need additional information please email Michael Hendrix at Michael.Hendrix@LSA.net.