5.17 ENERGY

This section evaluates the potential for energy-related impacts associated with the project and ways in which the project would reduce unnecessary energy consumption, consistent with the suggestions contained in Appendix F of the CEQA Guidelines. Energy service providers to the site include Southern California Edison (SCE) for electrical service and Southern California Gas Company (SCG) for natural gas.

5.17.1 Environmental Setting

Regulatory Background

Federal

Energy Independence and Security Act of 2007

The Energy Independence and Security Act of 2007 (Public Law 110-140) seeks to provide the nation with greater energy independence and security by increasing the production of clean renewable fuels; improving vehicle fuel economy; and increasing the efficiency of products, buildings, and vehicles. It also seeks to improve the energy performance of the federal government. The Act sets increased Corporate Average Fuel Economy Standards; the Renewable Fuel Standard; appliance energy efficiency standards; building energy efficiency standards; and accelerated research and development tasks on renewable energy sources (e.g., solar energy, geothermal energy, and marine and hydrokinetic renewable energy technologies), carbon capture, and sequestration.

State

Renewables Portfolio Standard

The California Renewables Portfolio Standard (RPS) was established in 2002 under Senate Bill (SB) 1078 and was amended in 2006 and 2011. The RPS program requires investor-owned utilities, electric service providers, and community choice aggregators to increase the use of eligible renewable energy resources to 33 percent of total procurement by 2020. The California Public Utilities Commission is required to provide quarterly progress reports on progress toward RPS goals. This has accelerated the development of renewable energy projects throughout the State. Based on the 3rd quarter 2014 report, the three largest retail energy utilities provided an average of 20.9 percent of its supplies from renewable energy sources. Since 2003, 8,248 megawatts (MW) of renewable energy projects have started operations (CPUC 2014). Senate Bill 350 (de Leon), was signed into law September 2015 and establishes tiered increases to the RPS—40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

State Alternative Fuels Plan

Assembly Bill (AB) 1007 requires the California Energy Commission (CEC) to prepare a plan to increase the use of alternative fuels in California. The State Alternative Fuels Plan was prepared by the CEC with CARB and in consultation with other federal, State, and local agencies to reduce petroleum consumption; increase use of alternative fuels (e.g., ethanol, natural gas, liquefied petroleum gas, electricity, and hydrogen); reduce

greenhouse gas (GHG) emissions; and increase in-state production of biofuels. The State Alternative Fuels Plan recommends a strategy that combines private capital investment, financial incentives, and advanced technology that will increase the use of alternative fuels; result in significant improvements in the energy efficiency of vehicles; and reduce trips and vehicle miles traveled through changes in travel habits and land management policies. The Alternative Fuels and Vehicle Technologies Funding Program legislation (AB 118, Statutes of 2007) proactively implements this plan (CEC 2007).

Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608) were adopted by the California Energy Commission on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally and non–federally regulated appliances. California's Appliance Efficiency Regulations (California Code of Regulations [CCR], Title 20, Parts 1600–1608) contain energy performance, energy design, water performance, and water design standards for appliances (including refrigerators, ice makers, vending machines, freezers, water heaters, fans, boilers, washing machines, dryers, air conditioners, pool equipment, and plumbing fittings) that are sold or offered for sale in California. These standards are updated regularly to allow consideration of new energy efficiency technologies and methods.

Energy Efficiency Standards (CCR Title 24, Part 6)

The Energy Efficiency Standards for Residential and Nonresidential Buildings (24 California Code of Regulations [CCR]] Part 6) were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The California Energy Commission (CEC) adopted the 2008 changes to the Building Energy Efficiency Standards in order to (1) "Provide California with an adequate, reasonably-priced, and environmentally-sound supply of energy" and (2) "Respond to Assembly Bill 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its greenhouse gas emissions to 1990 levels by 2020". Title 24 Part 6 of the 2013 California Building Standards Code, the 2013 California Energy Code, went into effect on July 1, 2014, and includes energy efficiency updates (CBSC 2015).

Most recently, the CEC adopted the 2016 Building and Energy Efficiency Standards. The 2016 Standards will continue to improve upon the current 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. These standards went into effect on January 1, 2017. Under the 2016 Standards, residential buildings are 28 percent more energy efficient than the 2013 Standards, and nonresidential buildings are 5 percent more energy efficient than the 2013 Standards (CEC 2015a). Buildings that are constructed in accordance with the 2013 Building Energy Efficiency Standards are 25 percent (residential) to 30 percent (nonresidential) more energy efficient than the prior 2008 standards as a result of better windows, insulation, lighting, ventilation systems, and other features. While the 2016 standards do not achieve zero net energy, they do get very close to the state's goal and make important steps toward changing residential building practices in California. The 2019 standards will take the final step to achieve zero net energy for newly constructed residential buildings throughout California (CEC 2015b).

Title 24, Part 11, Green Building Standards

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (Part 11, Title 24, known as CALGreen; adopted by reference in Chapter 18.47 [Green Building Standards Code] of the City's Municipal Code) was adopted as part of the California Building Standards Code (Title 24, California Code of Regulations). CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The mandatory provisions of CALGreen became effective January 1, 2011. The 2016 CALGreen took effect on January 1, 2017. The CALGreen Code is intended to (1) reduce greenhouse gas emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste, make buildings more efficient in the use of materials and energy, and reduce environmental impact during and after construction. The CALGreen Code contains requirements for construction site selection; storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for verifying that all building systems (e.g., heating and cooling equipment and lighting systems) are functioning at their maximum efficiency (CBSC 2015).

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model year 2017 through 2025 light-duty vehicles (see also the discussion on the update to the Corporate Average Fuel Economy standards under *Federal Laws*, above). In January 2012, CARB approved the Pavley Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025, new automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.

Executive Order B-18-12

Executive Order B-18-12 called for new or renovated state buildings larger than 10,000 square feet to achieve the U.S. Green Building Council's Leadership in Energy Efficiency and Design (LEED) "Silver" certification.

Local

City of Duarte

The City of Duarte's sustainable development practices in the City's development code are summarized below. Per the Alfred E. Alquist Hospital Facilities Seismic Safety Act of 1983, the Office of Statewide Health Planning and Development (OSHPD) is the enforcement agency for hospital buildings, acute psychiatric hospitals, skilled nursing facilities, and intermediate care facilities—as defined in Section 129725 of the Health and Safety Code—with regard to the applicable Title 24 building standards, preempting the local jurisdiction. However, the City of Duarte would have jurisdiction over parts of the proposed Campus Plan that are not under OSHPD's jurisdiction—such as surface parking, landscaping, parking structure, and other buildings not subject to OSHPD.

City of Duarte Sustainable Development Practices

The City of Duarte Sustainable Development Practices is codified in Chapter 19.52, Article 3, of the City's development code. This chapter includes guidelines and standards for conservation of natural resources, increased energy efficiency, and transit (e.g., transportation demand management, active transit design). Specific sustainable design requirements for energy efficiency, water conservation, transit and pedestrian access, and construction debris recycling depend on the level of development based on size (e.g., number of dwelling units, amount of nonresidential square footage), per Section 19.52.020(B). There are four levels of development, Level 1 to Level 4. Level 1 has the fewest requirements and Level 4 the most. In addition to these requirements, Chapter 19.52 includes optional measures that may be incorporated into an individual project.

City of Irwindale

The City of Irwindale has adopted the Los Angeles County Green Building Standards Code, which incorporates the California Green Building Standards Code. As with the City of Duarte, OSHPD is the enforcement agency for Title 24 building standards compliance. However, the City of Irwindale would have jurisdiction over components and facilities of the proposed Campus Plan that are not subject to OSHPD's jurisdiction.

Existing Conditions

Electricity

Supplies and Demands

The project site is in Southern California Edison (SCE)'s service area, which spans much of southern California from Orange and Riverside counties on the south to Santa Barbara County on the west to Mono County on the north (CEC 2011). Total electricity consumption in SCE's service area in gigawatt-hours is forecasted to be 102,218 GWh in 2016 and increase to 113,612 GWh in 2025 for the mid-demand scenario (CEC 2014); one GWh is equivalent to one million kilowatt-hours. Sources of electricity sold by SCE in 2014, the latest year for which data are available, were:

- 24 percent renewable, consisting mostly of geothermal and wind
- 3 percent large hydroelectric
- 27 percent natural gas
- 6 percent nuclear
- 40 percent unspecified sources – that is, not traceable to specific sources (SCE 2015)[1]

Existing electricity demands from existing development within the project site are estimated to be approximately 30.3 million kilowatt-hours annually, as shown in Table 5.17-1.

Table 5.17-1 Existing Estimated Electricity Demands

Land Use	CalEEMod Land Use Category	Unit	Quantity	Electricity Demands in kWh per Year	
				Per unit	Total
Inpatient/Outpatient	Hospital	SF	730,044	24.8	18,112,300
Office	Medical Office Building	SF	186,296	15.2	2,839,020
Research	Research & Development	SF	457,936	12.5	5,742,380
Assembly	General Office Building	SF	69,295	15.2	1,055,920
Data Center	General Heavy Industrial	SF	N/A	0.0	N/A
Industrial	General Light Industry	SF	73,909	12.5	926,686
Warehouse	Unrefrigerated Warehouse-No Rail	SF	59,244	4.6	270,612
Housing	Apartments Low Rise	units	6	3,727.6	22,233
Hospitality	Hotel	SF	18,168	9.1	164,469
Surface Parking	Parking Lot	SF	1,392,800	N/A	1,225,530
Parking structure	Enclosed Parking with Elevator	SF	None	N/A	N/A
Total	Not applicable	N/A	N/A	N/A	**30,359,150**

Notes: Electricity demand factors used in estimating the demands shown above are from the California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association (CAPCOA) 2016.

Facilities

An electrical substation is located near the middle of the project site's southern boundary. Currently Hopeful Substation is served by two 66/12 kV 12.5 Mega Volt Ampere (MVA) transformers (a volt-ampere is a measure of the apparent power in an electrical circuit; one MVA is one million volt-amperes). Based on historical data from January 2015 to October 2016, the maximum electrical load at the substation was 13.3 MVA. The load exceeds a single transformer's capacity, and therefore, redundancy has been lost during peak conditions. Existing subtransmission lines are adequate to serve existing electricity demands in the area (Reyes 2016).

[1] The electricity sources listed above reflect changes after the 2013 closure of the San Onofre Nuclear Generating Station, which is owned by SCE.

Natural Gas

Supplies and Demands

The Southern California Gas Company (SCGC) provides natural gas to the Plan Area. SCGC's service area spans much of the southern half of California, from Imperial County on the southeast to San Luis Obispo County on the northwest to part of Fresno County on the north to Riverside County and most of San Bernardino County on the east (CEC 2015). Total natural gas supplies available to SCGC are forecast to remain constant at 3.875 billion cubic feet per day (bcfd) from 2015 through 2035. Total natural gas consumption in SoCalGas's service area is forecast to be 2.681 bcfd in 2016 and 2.382 bcfd in 2035 (CGEU 2016). Estimated existing natural gas demand from existing development within the project site is approximately 66.5 million kBTU[2] annually, as shown in Table 5.17-2.

Table 5.17-2 Existing Estimated Natural Gas Demands

Land Use	CalEEMod Land Use Category	Unit	Quantity	Natural Gas Demands in kBTU per Year	
				Per unit	Total
Inpatient/Outpatient	Hospital	SF	730,044	71.4	52,139,700
Office	Medical Office Building	SF	186,296	12.4	2,317,520
Research	Research & Development	SF	457,936	19.8	9,067,130
Assembly	General Office Building	SF	69,295	12.4	862,030
Data Center	General Heavy Industrial	SF	N/A	N/A	N/A
Industrial	General Light Industry	SF	73,909	19.8	1,463,400
Warehouse	Unrefrigerated Warehouse-No Rail	SF	59,244	1.0	61,614
Housing	Apartments Low Rise	units	6	15,105.6	90,634
Hospitality	Hotel	SF	18,168	25.9	469,643
Surface Parking	Parking Lot	SF	1,392,800	N/A	N/A
Parking structure	Enclosed Parking with Elevator	SF	None	N/A	N/A
Total	Not applicable	N/A	N/A	N/A	**66,471,671**

Notes: Natural gas demand factors used in estimating the demands shown above are from the California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association (CAPCOA) 2016.

Facilities

A distribution pipeline extends east-west in Duarte Road along the project site's northern boundary. East of the site, the pipeline continues northward in Highland Avenue (Chuang 2016).

Central Utilities Plant

Energy for the project is generated by the Central Utilities Plant located on the project site. The Central Utilities Plan is composed of boilers, chillers, and a cooling water system with a cooling tower. Natural gas is

[2] kBTU = thousand British thermal units; 1,000 BTU.

used in the broilers and electricity is used by the billers, cooling water system, boiler feed pumps, and other ancillary equipment.

5.17.2 Thresholds of Significance

Section 21100(b)(3) of the California Environmental Quality Act (CEQA) requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing any inefficient, wasteful, and unnecessary consumption of energy. Although not specifically in Appendix G of the CEQA Guidelines, Appendix F of the CEQA Guidelines states that the goal of conserving energy implies the wise and efficient use of energy and the means of achieving this goal include 1) decreasing overall per capita energy consumption; 2) decreasing reliance on fossil fuels such as coal, natural gas and oil; and 3) increasing reliance on renewable energy sources. Appendix F of the CEQA Guidelines states that potential environmental impacts considered in the EIR concerning energy may include the following:

- The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials maybe discussed.
- The effects of the project on local and regional energy supplies and on requirements for additional capacity.
- The effects of the project on peak and base period demands for electricity and other forms of energy.
- The degree to which the project complies with existing energy standards.
- The effects of the project on energy resources.

Therefore, the following additional thresholds are also addressed in the impact analysis: a project would normally have a significant effect on the environment if the project:

ENG-1 Would the project substantially increase demand on energy or require the construction of new or the expansion of existing facilities, the construction of which could cause significant environmental effect.

ENG-2 Would result in an inefficient, wasteful and unnecessary consumption of energy.

5.17.3 Project Design Features

The following project design features would address reducing energy consumption associated with the proposed project:

Energy Efficiency and Conservation

- Exceeding local and state energy-efficiency building requirements is encouraged.

- Energy-efficient design and natural lighting and ventilation should be used wherever possible.
- The use of materials that reduce heat transfer into and out of buildings (such as light-colored roofing materials) is encouraged.
- Whenever possible, building articulation and form should be expressive of and driven by environmental and site conditions, such as solar orientation, views, noise, prevailing winds, and local climate. South- and west-facing windows should either be tinted or shaded with an overhang, deciduous trees, or awnings to reduce summer exposure.
- Buildings are encouraged to integrate sustainable design features such as photovoltaic panels (especially on top of parking decks), renewable materials with proven longevity, and storm water treatment where feasible.
- Green roofs may be considered as alternatives to active spaces and to help reduce the urban heat island effect.
- Planting of trees along southern and western building walls is encouraged to reduce the urban heating effect.
- Large specimen trees should be incorporated near major new buildings to provide a signature landscape element and to help increase the building's energy efficiency through additional shading.
- Lighting design should consider the use of control systems that reduce light levels during low-usage times whole not sacrificing uniformity or safety.

Healthy Design

- Recreational amenities should be incorporated on campus, including community gardens, gathering spaces, campus walking paths/routes, and areas for physical activity.
- Buildings should provide visibility and access to active/recreational areas.
- Bicycle storage and infrastructure should be secure, easily accessible and identifiable, and near building entrances.
- To facilitate pedestrian movement, a continuous, unobstructed path of travel must be maintained in any pathway.
- Pedestrian pathways can be used to connect less active outdoor spaces with more active uses.

Water Conservation

- Irrigation systems should use water-conserving methods and water-efficient technologies such as drip emitters, evapotranspiration controllers, and moisture sensors.
- Irrigation systems shall be operated automatically using an electric controller and low-voltage remove control valves.
- Plant material should incorporate native and low-water-use species consistent with the plant palettes recommended by the City of Duarte and City of Irwindale landscape regulations.
- Landscaping areas should use plants that require minimal water resources. Drought-tolerant grasses should be used for lawn areas where possible.

5.17.4 Environmental Impacts

Methodology

Based on CEQA Guidelines Appendix F, Energy Conservation, of the State CEQA Guidelines, in order to ensure energy implications are considered in project decisions, CEQA identifies that EIRs include a discussion of the potential impacts of proposed projects, with particular emphasis on avoiding or reducing wasteful, unnecessary, or inefficient use of energy resources as applicable. Environmental effects may include the project's energy requirements and its energy use efficiencies by amount and fuel type during construction, operation and decommissioning; the effects of the project on local and regional energy supplies; the effects of the project on peak and base period demands for electricity and other forms of energy; the degree to which the project complies with existing energy standards; the effects of the project on energy resources; and the project's projected transportation energy use requirements and its overall use of efficient transportation alternatives, if applicable. This discussion is provided below.

The following impact analysis addresses the thresholds of significance identified above. The applicable thresholds are identified in brackets after the impact statement.

Impact 5.17-1: Existing and planned electricity and natural gas facilities would be able to accommodate utility demands generated by buildout of the proposed project. [Threshold ENG-1]

Impact Analysis:

Short-Term Construction Impacts

Construction of the project would create temporary increased demands for electricity and vehicle fuels compared to existing conditions and would result in short-term transportation energy use.

Electrical Energy

The project site is already developed and consumes an average annual electricity demand of 30,359,150 kilowatt hour (kWh) (California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association [CAPCOA] 2016). Construction of the proposed project would require electricity use to power the construction-related equipment. The electricity use during construction would vary during different phases of construction, where the majority of construction equipment during demolition and grading would be gas-powered or diesel-powered, and the later construction phases would require electricity-powered, such as interior construction and architectural coatings. Since the project site is already served by onsite electrical infrastructure, adequate infrastructure capacity is available to accommodate the electricity demand during construction would not require additional or expanded electrical infrastructure.

The construction contractors are anticipated to minimize idling of construction equipment during construction and reduce construction and demolition waste by recycling. Such required practices would limit wasteful and unnecessary electrical energy consumption. Thus, impacts from energy use during short-term construction activities would be less than significant.

Gas Energy

The project site already being served by SCG and such demands would be eliminated once construction operations are completed. The construction-related equipment would not be powered by natural gas and no natural gas demand is anticipated during construction. No new or expanded natural gas facilities or supply are anticipated. Impacts related to gas energy use during short-term construction activities would be less than significant.

Transportation Energy

Transportation energy use depends on the type and number of trips, vehicle miles traveled, fuel efficiency of vehicles, and travel mode. Transportation energy use during construction would come from the transport and use of construction equipment, delivery vehicles and haul trucks, and construction employee vehicles that would use diesel fuel and/or gasoline. The use of energy resources by these vehicles would fluctuate according to the phase of construction and would be temporary. The majority of construction equipment during demolition and grading would be gas-powered or diesel-powered, and the later construction phases would require electricity-powered. Impacts related to transportation energy use during construction would be temporary and would not require expanded energy supplies or the construction of new infrastructure. Additionally, implementation of Mitigation Measure AQ-2 would require the construction contractor to utilize Level 3 Diesel Particulate Filters for all construction equipment of 50 horsepower or more and ensure that all non-essential idling of construction equipment is restricted to five minutes or less in compliance with California Air Resources Board Rule 2449, thus reducing transportation energy consumption. Impacts would not be significant.

Long-Term Operational Impacts

Operation of the project would create additional demands for electricity and natural gas compared to existing conditions, and would result in increased transportation energy use. Operational use of energy would include heating, cooling, and ventilation of buildings; water heating; operation of electrical systems, security and control center functions, use of on-site equipment and appliances; and indoor, outdoor, perimeter, and parking lot lighting.

Electrical Energy

Buildout under the proposed Campus Plan would create a net increase in electricity demand of approximately 48.1 million kilowatt hour annually compared to existing conditions, as shown in Table 5.17-3. This net increase is well within SCE's systemwide net increase in electricity supplies of approximately 13,400 GWh annually over the 2012-2024 period. Therefore, there are sufficient planned electricity supplies in the region for the estimated net increase in electricity demands, and buildout under the Campus Plan would not require expanded electricity supplies. Installation of one new 28 MVA transformer at the Hopeful Substation would be required to meet estimated electricity demands from Campus Plan buildout. Two 28 MVA transformers could be installed, if desired, to provide redundancy; both transformers could be installed within the existing substation fence (Reyes 2016).

Table 5.17-3 Forecast Electricity Demands from Project Buildout

			Quantity		Electricity Demands in kWh per Year		
					Per unit		
Land Use	CalEEMod Land Use Category	Unit	Existing Remaining	New Proposed	Existing Remaining	New Proposed	Total[1]
Inpatient/Outpatient	Hospital	SF	629,544	670,000	24.8	22.9	18,112,300
Office	Medical Office Building	SF	68,296	250,000	15.2	13.1	2,839,020
Research	Research & Development	SF	387,936	371,000	12.5	11.2	5,742,380
Assembly	General Office Building	SF	40,295		15.2	0.0	1,055,920
Data Center	General Heavy Industrial	SF		30,000	0.0	769.0	23,070,000
Industrial	General Light Industry	SF	70,409	30,000	12.5	11.2	926,686
Warehouse	Unrefrigerated Warehouse-No Rail	SF	10,744		4.6	0.0	270,612
Housing	Apartments Low Rise	units	6	0	3,727.6	N/A	22,233
Hospitality	Hotel	SF	168	75,000	9.1	7.6	164,469
Surface Parking	Parking Lot	SF	359,600	575,800	0.9	0.9	841,860
Parking structure	Enclosed Parking with Elevator	SF		1,200,000	N/A	6.5	7,800,000
Total	Not applicable		N/A	N/A	**N/A**		**78,516,687**
Existing Demands (from Table 5.17-1)							**30,359,150**
Net Increase							**48,157,537**

Notes: electricity demand factors used in estimating the demands shown above are from the California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association (CAPCOA) 2016.

[1] Total electricity demand at buildout is
[(existing remaining square footage) x (electricity demand per square foot for existing remaining uses)] **+**
[(new proposed square footage) x (electricity demand per square foot for new proposed uses)]

Additionally, plans submitted for building permits of development projects in the Campus Plan area would be required to include verification demonstrating compliance with the 2016 Building and Energy Efficiency Standards and are also required to be reviewed. Future projects would also be required adhere to the provisions of CALGreen, which established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.

Furthermore, the Specific Plan outlines a number of provisions that would ensure that individual development projects in within the project site are designed with energy conservation in mind, including;

- **Goal 4. Sustainable Development and Design:** Sustainable practices in building design, construction, and maintenance help to minimize the campus's impact on surrounding infrastructure and facilities.
    - **Green Building Standards.** Maximize energy efficiency, indoor air quality, energy-efficient lighting, building orientation, and shading through local and state standards and/or through implementation of LEED principles.
    - **Water Efficiency.** Incorporate water-efficient design features and practices such as xeriscaping, permeable surfaces, collection devices, biofiltration devices, green rooftops, cisterns, berms and swales, and green roofs.
    - **Building Systems.** Replace older buildings and infrastructure that require high maintenance with more efficient, lower-maintenance, and environmentally sensitive systems.
    - **Adaptive Reuse of Buildings.** Reuse or continue to use structurally compliant and technologically up-to-date facilities.
    - **Energy Generation.** Consider building layout, siting, and design so as not to preclude on-site alternative energy production.
    - **Sustainable Infrastructure.** Incorporate sustainable infrastructure practices in an efficient and cost-effective manner.

Impacts would be less than significant after implementation of the foregoing Specific Plan provisions.

The proposed project would be required to comply with the current Building Energy Efficiency Standards and to implement Countywide energy and environmental policy to achieve silver rating or better Leadership in Energy and Environmental Design (LEED) certification. The proposed project would be consistent with the requirements of these energy-related regulations, and would not result in wasteful or unnecessary electricity demands. Therefore, the proposed project would not result in a significant impact related to electricity.

Gas Energy

Buildout of the Campus Plan would generate a net increase in natural gas demands of approximately 42.5 million kBTU annually – or about 113,000 cubic feet per day – as shown in Table 5.17-4. New developments under the Campus Plan would use less natural gas per square foot as would existing land uses; note the lower natural gas demands per square foot for new development in Table 5.17-4. Total natural gas demands onsite at Campus Plan buildout would be about 109 million kBTU annually, or about 289,860 cubic feet per day. Total natural gas supplies available to SCGC are forecast to remain constant at 3.875 billion cubic feet per day (bcfd) from 2015 through 2035 (CGEU 2016). Total natural gas demands in SoCalGas's service area are forecast to decrease by 0.299 bcfd by 2035 to 2.382 bcfd due to intense energy efficiency efforts. The forecast net increase in natural gas demands due to buildout under the Campus Plan are will within SoCalGas's forecasts of natural gas supplies, and therefore, would not require new or expanded natural gas supplies. Impacts would be less than significant.

Table 5.17-4 Forecast Natural Gas Demands from Project Buildout

			Quantity		Natural Gas Demands in kBTU per Year		
					Per unit		
Land Use	CalEEMod Land Use Category	Unit	Existing Remaining	New Proposed	Existing Remaining	New Proposed	Total[1]
Inpatient/Outpatient	Hospital	SF	629,544	670,000	71.4	62.3	86,688,900
Office	Medical Office Building	SF	68,296	250,000	12.4	10.0	3,338,732
Research	Research & Development	SF	387,936	371,000	19.8	17.5	14,164,170
Assembly	General Office Building	SF	40,295		12.4		501,270
Data Center	General Heavy Industrial	SF		30,000	N/A	17.5	524,235
Industrial	General Light Industry	SF	70,409	30,000	19.8	17.5	1,918,335
Warehouse	Unrefrigerated Warehouse-No Rail	SF	10,744		1.0	N/A	11,174
Housing	Apartments Low Rise	units	6		15,105.6	N/A	90,634
Hospitality	Hotel	SF	168	75,000	25.9	23.1	1,735,263
Surface Parking	Parking Lot	SF	359,600	575,800	0	0	0
Parking structure	Enclosed Parking with Elevator	SF		1,200,000	0	0	0
Total	N/A	N/A	N/A	N/A	N/A	N/A	**108,972,712**
Existing Demands (from Table 5.17-2)							**66,471,671**
Net Increase							**42,501,042**

Notes: Natural gas demand factors used in estimating the demands shown above are from the California Emissions Estimator Model Version 2016.3.1 by California Air Pollution Control Officer's Association (CAPCOA) 2016.

[1] Total natural gas demand at buildout is
[(existing remaining square footage) x (natural gas demand per square foot for existing remaining uses)] **+**
[(new proposed square footage) x (natural gas demand per square foot for new proposed uses)]

Development pursuant to the proposed project would result in a net increase in the natural gas demands. The project site is already served by SCG, and the increased development intensities in the area may require upgrades to the existing system. Gas service would be added to the existing system by SCG as necessary to meet the requirements. There is extensive and reliable gas services in the area, and the improvements would occur in accordance with the SCG's policies and extension rules on file with the Public Utilities Commission

(PUC) when the contractual agreements are made. The availability of natural gas service is based on present gas supply and regulatory policies. As a public utility, SCG is under the auspices of the PUC and federal regulatory agencies. Should these agencies take any action that affects gas supply or the conditions under which service is available, gas service would be provided in accordance with revised conditions. Although the project implementation would create additional demands on natural gas supplies and distribution infrastructure, the increased demands are projected to be within the service capabilities of SCG.

Further, the proposed project will demolish older buildings that employ less-efficient natural gas systems, and newly constructed buildings will employ lower-maintenance and high-efficiency gas systems. Several project design features would also reduce overall natural gas consumption by implementing energy-efficient design (e.g., building orientation); enhancing natural lighting and ventilation; utilizing building materials that reduce heat transfer in and out of buildings (e.g., light-colored roofing and green roofs); installing photovoltaic panels; planting trees along building perimeters to reduce urban heating effect and providing additional shading; and exceeding local and state energy-efficiency building requirements. No significant impacts are anticipated.

Transportation Energy

The proposed project would consume transportation energy during operations from the use of motor vehicles. Transportation energy is based on vehicle miles traveled (VMT) data provided by Fehr and Peers for the proposed project in addition to VMT and fuel consumption data for the County of Los Angeles as obtained using EMFAC2014, Version 1.0.7., and vehicle fleet mix based on CalEEMod, Version 2016.3.2.1, and California Department of Transportation data.

The vehicle trip length analysis focused specifically on trip origins and destinations in the counties of Kern County, Ventura County, Los Angeles County, Orange County, San Bernardino County, Riverside County, and San Diego County. The cell phone data is used to estimate VMT by capturing a sample of trip distances of anyone who was working or visiting the City of Hope from July 2014 to June 2015.

The total daily VMT for the existing City of Hope facility is 170,585, which is based on the existing trip generation of 11,929 daily trips (Fehr & Peers 2017). Under the current condition, the transportation energy demand is estimated at 8,973 gallons per day, and 3,113,725 gallons per year[3] of gasoline and diesel fuel.

The proposed project would increase total daily VMT by 67,968 to 238,553, a 39.8 percent increase from existing conditions. At buildout, the proposed project would consume an estimated 7,852 gallons per day, and 2,724,522 gallons per year[4] of gasoline and diesel fuel. Compared to existing conditions, this results in a net decrease in fuel consumption of 1,121 gallons per day, and 389,203 gallons per year of gasoline and diesel fuel. The primary reason for this decrease is an increase in the average corporate fuel economy of vehicles as a result of state and federal laws, as well as vehicle turn over, that improves the overall fuel economy of California's vehicle fleets.

[3] Based on CARB's EMFAC 2014 fleet efficiency for year 2016 based on the fleet mix included in the traffic study, as modeled in CalEEMod.

[4] Based on CARB's EMFAC 2014 fleet efficiency for year 2035 based on the fleet mix included in traffic study, as modeled in CalEEMod.

The City of Duarte and its surrounding area are highly urbanized with numerous gasoline fuel facilities and infrastructure. Consequently, the proposed project would not result in a substantial demand for energy that would require expanded supplies or the construction of other infrastructure or expansion of existing facilities.

Other Considerations

In addition the evaluation above, recent case law suggests that other considerations related to energy be evaluated including whether a building should be constructed at all, how large it should be, where it should be located, whether it should incorporate renewable energy resources. These considerations are discussed below:

Project Need: The project site is developed with 1,600,850 gross square feet of total development (including the following land uses: Core Medical, Transition Medical, and Infrastructure and Utility). The Statement of Objectives included in the Project Description (Section 3.2) projects an increase in regional demand for outpatient services through 2035. The existing facility will not fulfill the minimum future requirements of future outpatient services, and therefore, enhancement and development of the existing City of Hope campus facility is necessary.

Building Size: The City proposes to increase development on the existing City of Hope campus. The proposed net new development (proposed new – proposed demolition) is 1,038,500 gross square feet, resulting in a total buildout development (existing + net new) of 2,639,350 gross square feet. As noted above, increasing the area of development for the City of Hope campus is necessary to the project's core objectives. In addition, the proposed project will demolish up to 387,500 gross square feet of building area, which includes buildings that require high maintenance and do not incorporate sustainable design elements. The proposed project includes up to 1,426,000 gross square feet of new development, which would incorporate lower-maintenance and environmentally sensitive systems, as well as sustainable design elements. The proposed size of the project is based on the required demand of services, and will therefore increase the size of the total development. However, the proposed project's sustainable design elements will increase energy efficiency to the extent possible.

Project Location: The proposed project includes development and enhancement of an existing facility in the City of Duarte and Irwindale. All project developments will be located on the existing City of Hope Campus, and therefore, the location of the proposed project will not affect the existing vehicle miles travelled (VMT) and associated gasoline consumption (project-related VMT and associated gasoline consumption is discussed in detail above, in Transportation Energy. The location of the proposed project will not affect potential energy consumption.

Incorporation of Renewable Energy: One of the goals of the City of Hope Master Plan would enforce sustainable practices in site development, building design, construction practices, and maintenance help to minimize the Campus's impact on surrounding infrastructure, facilities, and the natural environment. Sustainable design elements include compliance with Green Building Standards, Water Efficiency Practices, Low-Maintenance and Environmentally Sensitive Building Systems, Adaptive Reuse of Buildings, Consideration of Energy Generation and Construction Waste, Off-Site Impacts, and Sustainable Infrastructure. The proposed project does not specifically incorporate the use of renewables into the Master

Plan. However, it should be noted that SCE, which provides electricity to the project site, recently developed the Tehachapi Renewable Transmission Project that will increase the amount of energy that the project site and surrounding area generates from renewable power. The Tehachapi Renewable Transmission Project will enhance electric service reliability in the region, and will help meet California's renewable energy goals.

Based on the analysis above, Impact 5.17-1 would be less than significant.

Furthermore, as required by Mitigation Measure GHG-1, the City of Hope would be required to implement sustainable development features, such as future alternative energy production (photovoltaic systems), energy efficient appliances, and LEED certification, which will further encourage renewable energy.

Impact 5.17-2: The proposed project would not result in inefficient, wasteful and unnecessary consumption of energy. [Threshold ENG-2]

Impact Analysis:

Short-Term Construction Impacts

The proposed project would not result wasteful, inefficient, or unnecessary use of energy during construction. It is anticipated that the construction equipment would be well maintained and meet the appropriate Tier ratings per CALGreen or EPA emissions standards, such that adequate energy efficiency level is achieved. Construction trip would not result in unnecessary use of energy since the project site is centrally located and is served by numerous regional freeway system (e.g., I-605, I-210) that provides most direct and shortest routes from various areas of the region. Electrical energy would be available for use during construction from existing power lines and connection, avoiding the use of generators that are less efficient than tying into existing SCE infrastructure. Thus, energy use during construction of the project would not be considered inefficient, wasteful, or unnecessary. Impacts would be less than significant and no mitigation is required.

Long-Term Operational Impacts

The proposed project would not result in inefficient, wasteful and unnecessary consumption of energy. The proposed project would reduce wasteful energy consumption at the existing City of Hope Campus by ensuring that new buildings implement improved electrical, natural gas, water, and wastewater systems that comply with the current California Building Energy and Efficiency Standards (Title 24, Part 6) and California Green Building Standards Code (CALGreen) (Title 24, Part 11). The 2016 Building and Energy Efficiency Standards are effective starting on January 1, 2017. The Building Energy and Efficiency Standards and CALGreen are updated tri-annually with a goal to achieve net zero energy for residential buildings by 2020 and non-residential buildings by 2030. The proposed project would not result in a significant inefficient, wasteful and unnecessary consumption of energy. Based on the analysis above, Impact 5.17-2 would be less than significant.

5.17.5 Cumulative Impacts

Electrical Energy

The geographic area for electricity service is SCE boundaries and for natural gas service is SCG boundaries. The proposed project would result in an increased services demand in electricity and natural gas. Although the proposed project would result in a net increase in electricity, this increase would not require SCE to expand or construct infrastructure to that could cause substantial environmental impacts. As discussed previously, the total annual electricity consumption in SCE's service area in gigawatt-hours is forecast to increase by 11,394 million kilowatt hours (11,394 GWh) between 2016 and 2025 for the mid-demand scenario. While this forecast represents a very large increase in electricity consumption, the project's percent of cumulative consumption would be approximately 0.42 percent. The project, in combination with cumulative development, is well within SCE's systemwide net increase in electricity supplies annually over the 2012 to 2024 period, and there are sufficient planned electricity supplies in the region for estimated net increases in energy demands. As such, cumulative impacts would be less than significant.

Gas Energy

Similarly, additional natural gas infrastructure is not anticipated due to cumulative development. Total natural gas consumption in SCG's service area is forecast to decrease by 0.299 bcfd between 2016 and 2035 due to intense energy efficiency efforts, while total natural gas supplies are forecast to remain constant at 3.875 bcfd. Therefore, it is anticipated that SCG would be able to meet the natural gas demand of the cumulative projects without additional facilities. In addition, both SCE and SCG's demand forecasts include the growth contemplated by the project and the other cumulative projects. SCE and SCG plan to continue to provide reliable service to its customers and upgrade their distribution systems as necessary to meet future demand.

Transportation Energy

Transportation energy use would also increase; however, this transportation energy use would not represent a major amount of energy use when compared to the amount of existing development and to total number of vehicle trips and vehicle miles travelled throughout the county and the region. The proposed project and other cumulative projects are required to comply with various federal and state government legislation to improve energy efficiency in buildings, equipment, and appliances and reduce vehicle miles travelled. Increased energy efficiency to comply with building energy efficiency standards will reduce energy consumption on a per square foot basis. In addition, utility companies are required to increase their renewable energy sources to meet the RPS mandate of 50 percent renewable supplies by 2030. Further, compliance with the existing regulatory requirements and project design features would ensure that proposed project does not result in an inefficient, wasteful and unnecessary consumption of energy. Therefore, cumulative impacts to energy resources would be less than significant.

5.17.5.1 EXISTING REGULATIONS

This analysis assumes compliance with all applicable laws. The following codes, rules, and regulations pertain to electricity and natural gas supplies were described in detail in Section 5.16.6.1 of this DEIR and are listed below.

- California Green Building Standards Code (Part 11, Title 24)
- California Code of Regulations, Title 20: Appliance Efficiency Regulations
- California Code of Regulations, Title 24: Building Energy Efficiency Standards

5.17.6 Level of Significance Before Mitigation

Upon implementation of regulatory requirements, the following impacts would be less than significant: 5.17-1 and 5.17-2.

5.17.7 Mitigation Measures

No mitigation measures are required, however Mitigation Measure GHG-1 in Section 5.6 of this DEIR would reduce energy consumption.

5.17.8 Level of Significance After Mitigation

No significant impacts related to energy resources have been identified. No significant and unavoidable impacts are anticipated.

5.17.9 References

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