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SAN DIEGO STATE UNIVERSITY
MISSION VALLEY CAMPUS MASTER PLAN
PROJECT
ENERGY TECHNICAL REPORT
SAN DIEGO STATE UNIVERSITY
SAN DIEGO, CALIFORNIA

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AB	Assembly Bill
ABAG	Association of Bay Area Governments
ARB	Air Resources Board
ATCM	Airborne Toxic Control Measure
BAU	Business-As-Usual
BTU	British Thermal Unit
CalEEMod®	California Emissions Estimator Model®
CalGreen	California Green Building Standards Code
CAP	Climate Action Plan
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
CPUC	California Public Utilities Commission
CSU	California State University
DOT	U.S. Department of Transportation
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
EV	Electric vehicle
FTES	full-time equivalent students
GHG	greenhouse gas
GWh	gigawatt hours
HVAC	Heating, Ventilation and Air Conditioning
I-8	Interstate 8
I-15	Interstate 15
IEPR	Integrated Energy Policy Report
ISTEA	Intermodal Surface Transportation Efficiency Act
kWh	kilowatt hours
LCFS	Low Carbon Fuel Standard
LEED	Leadership in Energy and Environmental Design
LPG	liquefied petroleum gas
MMBtu	million british thermal unit
MMT	million metric tonnes
mpg	miles per gallon
MPO	Metropolitan Planning Organization
MTS	Metropolitan Transit System
MVCP	Mission Valley Community Plan
MWh	megawatt hours
NHTSA	National Highway Traffic Safety Administration
NO _x	oxides of nitrogen
OPR	Office of Planning and Research
PDF	Project Design Feature
PM	particulate matter
project	SDSU Mission Valley Campus Master Plan Project

ACRONYMS AND ABBREVIATIONS *(CONTINUED)*

Acronym	Definition
PV	photovoltaic
RPS	Renewables Portfolio Standard
RTPs	regional transportation plans
SANDAG	San Diego Association of Governments
SB	Senate Bill
SCS	Sustainable Communities Strategy
SDG&E	San Diego Gas & Electric Company
SDMC	San Diego Municipal Code
SDCCU	San Diego County Credit Union
SDSU	San Diego State University
TDM	Transportation Demand Management
TEA	Transportation Efficiency Act
TIA	Transportation Impact Analysis
VDECS	Verified Diesel Emission Control Strategies
VMT	vehicle miles travelled

1. INTRODUCTION

Ramboll US Corporation (Ramboll) was retained to prepare an Energy Technical Report for the proposed San Diego State University (SDSU) Mission Valley Campus Master Plan Project (proposed project). The proposed project is referenced in San Diego Municipal Code (SDMC) Section 22.0908, Sale of Real Property to SDSU, which was adopted after the SDSU West Campus Research Center, Stadium, and River Park Initiative (Measure G) was approved by the voters of the City of San Diego on November 6, 2018.

This Energy Technical Report analyzes the proposed project's impacts on energy demand from construction and operations. In particular, this report describes the existing setting of the project site, describes the relevant regulatory setting, discusses the methodology used to evaluate energy resources related to the project, describes relevant project design features (PDFs), and evaluates potential impacts related to those energy resources that would be affected as a result of implementation of the proposed project.

1.1 Project Site and Description

The property comprising the project site is located in the northeast portion of the Mission Valley community within the City of San Diego. Specifically, the project site is situated south of Friars Road, west of Interstate 15 (I-15), north of Interstate 8 (I-8), and east of the existing Fenton Marketplace shopping center. It is approximately 5 miles from downtown San Diego and approximately 2.5 miles west of the existing SDSU main campus situated along I-8 within the College Area Community of the City of San Diego.

The proposed project entails the acquisition, construction, and operation of a new 169-acre SDSU Mission Valley mixed-use campus, research park, and stadium to support SDSU's education, research, entrepreneurial, technology, and athletics programs that can no longer be accommodated at SDSU's existing 287-acre main campus. Specifically, the proposed project would include:

- A. approximately 84 acres of open space, including shared SDSU/community active and passive parks and recreation fields, the approximate 34-acre River Park, and pedestrian, hiking, and biking trails;
- B. approximately 1.6 million square feet of campus uses for education, research, entrepreneurial, and technology programs;
- C. construction of a new, multipurpose 35,000-capacity stadium and the corresponding demolition of the existing San Diego County Credit Union (SDCCU) Stadium (formerly, Qualcomm Stadium);
- D. approximately 4,600 residential homes for student, faculty, staff, including market-rate, workforce, and affordable homes, in proximity to a vibrant university village atmosphere;
- E. two hotels with approximately 400 hotel rooms to support campus visitors and stadium-related events, provide additional conference facilities, and provide academic opportunities for graduate and undergraduate students in SDSU's hospitality and tourism management program;
- F. approximately 95,000 square feet of community-serving retail space to support campus, stadium, and related facilities;

- G. trolley/transit opportunities to minimize vehicular traffic use by using the existing underutilized Metropolitan Transit System's Green Line transit station, accommodating the planned Purple Line transit station, and providing an enhanced pedestrian connection to the existing light rail transit center; and
- H. associated infrastructure, utilities, facilities, and other amenities.

The new SDSU Mission Valley Campus Master Plan would accommodate up to 15,000 full-time equivalent students (FTES) over time, resulting in a total student headcount of approximately 20,000 students and resulting in approximately 1,900 total faculty and staff.

Table 1-1, Campus Land Use Summary Table, provides a statistical breakdown of the components of the proposed project.

1.2 Existing Condition

The property comprising the project site includes three existing uses: (1) a multi-purpose stadium (SDCCU Stadium) with an existing capacity of approximately 71,500 seats for football and other events; (2) an associated surface parking lot with approximately 18,870 parking spaces; and (3) the Metropolitan Transit System's existing Green Line transit station, which provides trolley service running toward downtown San Diego to the west and Santee to the east. The SDSU main campus is three trolley stops from the existing on-site trolley station.

1.3 Project Analysis

This report evaluates the energy consumption associated with project-related construction activities and operational activities for complete buildout of the proposed project. Project buildout is estimated to be realized in calendar year 2037. Because California has adopted regulatory measures for greenhouse gas (GHG) emissions that take effect by 2030 and serve to influence energy consumption, some aspects of the energy inventory are based on adopted 2030 regulatory measures (e.g., renewable portfolio standard [RPS]). Other aspects of the energy inventory, such as the EMFAC2014 emissions factors for mobile sources, are representative of project conditions at full buildout. We note that the California Emissions Estimator Model® (CalEEMod®) allows for operational years up to 2035; given that the mobile emission factors are based on the operational year, the mobile emission factors used to estimate the corresponding consumption of transportation fuels are based on values from EMFAC2014 for the year 2035.

The analysis provided by this report is conservative because further beneficial changes to California's regulatory framework, serving to reduce energy consumption and enhance energy efficiency, are reasonably anticipated with the passage of time. For example, California revises its building energy standards (as set forth in Title 24 of the California Code of Regulations) on a periodic basis. California's building codes are published in their entirety every three years. Intervening Code Adoption Cycles produce Supplement pages half-way (18 months) into each triennial period. The next Title 24 code to be published is the 2019 Code; the corresponding building energy standards were adopted in May 2018 and will take effect in January 2020. Each subsequent building code has required more energy efficiency than the previous codes. Accordingly, because this analysis is based on current codes, it necessarily will result in an overestimate of energy usage in buildings.

2. ENERGY ENVIRONMENTAL AND REGULATORY OVERVIEW

2.1 General Setting

2.1.1 Energy Production and Distribution

Among the states, California ranks fourth in the nation in production of crude oil, 15th in production of natural gas, second in generation of hydroelectric power, 15th in electricity generation from nuclear power, second in net electricity generation from all other renewable energy sources besides hydroelectric, and first as a producer of electricity from biomass, geothermal, and solar energy.¹ California produces approximately 10% of the natural gas used in the state; approximately 90% of the natural gas used in California is imported from Canada, the Southwest, and the Rocky Mountains region of the United States. Over half of the crude oil refined in California is from foreign countries, including Saudi Arabia, Ecuador, and Colombia. Additional crude oil is imported from Alaska. Over one-fourth of California's electricity is from out-of-state locations in the Pacific Northwest and the Southwest.²

Electricity and Natural Gas Supply

The production of electricity requires the combustion, consumption, or conversion of other energy resources, including water, wind, oil, natural gas, coal, solar, geothermal, and nuclear. Of the electricity that is generated within the state, 53% is generated by natural gas-fired power plants, 11% by nuclear power plants, 10% by hydroelectric, and a remaining 26% by other renewables.³

Natural gas ultimately supplies the largest portion of California's electricity market; natural gas-fired power plants in California meet approximately 34% of the in-state electricity demand.³ In addition to the generation of electricity, natural gas is also widely used for industrial, commercial, and residential heating. Most of the natural gas consumed in California comes from the Southwest, the Rocky Mountains, and Canada, while the remainder is produced in California. Although contractually California can receive natural gas from any producing region in North America, it can only take supplies from these three producing regions due to the current pipeline configuration.

For the City of San Diego, San Diego Gas & Electric Company (SDG&E) is the primary supplier of electricity and natural gas to businesses and residents of the area. SDG&E's 4,100-square-mile service area extends from southern Orange County to San Diego County. SDG&E's electricity production facilities include natural gas-fired and peaking power plants. SDG&E obtains its energy supplies from plants in southern California and southern Nevada. SDG&E has installed numerous solar energy projects or photovoltaic power-generation equipment, throughout its service territory. In 2017, about 45 percent of the energy delivered to SDG&E's customers came from renewable energy-related projects. In addition, in 2017, SDG&E activated the world's largest lithium ion battery storage facility, capable of storing up to 120 megawatt hours (MWh) of electricity.

¹ U.S. Energy Information Administration. 2018. California State Profile and Energy Estimates: Profile Overview. Available online at: <http://www.eia.gov/state/?sid=CA>. Accessed: July 2019.

² U.S. Energy Information Administration. 2018. California State Profile and Energy Estimates: Profile Analysis. Available online at: <https://www.eia.gov/state/analysis.cfm?sid=CA>. Accessed: July 2019.

³ California Energy Commission. 2018. 2017 Total System Electric Generation in Gigawatt Hours. Available online at: https://www.energy.ca.gov/almanac/electricity_data/total_system_power.html. Accessed: May 2019.

Transportation Fuels Supply

Most petroleum fuel refined in California is for use in on-road motor vehicles and is refined within California to meet state-specific formulations required by the California Air Resources Board (ARB). The major categories of petroleum fuels are gasoline and diesel for passenger vehicles, transit, and rail vehicles; and fuel oil for industry and emergency electrical power generation. Other liquid fuels include kerosene, jet fuel, and residual fuel oil for marine vessels.

California's oil fields make it the third-largest petroleum-producing state in the United States, behind Texas and North Dakota (federal offshore production is the biggest producer in the United States). Crude oil is moved from area to area within California through a network of pipelines that carry it from both onshore and offshore oil wells to the refineries that are located in the San Francisco Bay Area, the Los Angeles area, and the Central Valley. Currently, 16 petroleum refineries operate in California, processing approximately 2.0 million barrels per day of crude oil.⁴

Other transportation fuel sources are alternative fuels, such as methanol and denatured ethanol (alcohol mixtures that contain no less than 70% alcohol), natural gas (compressed or liquefied), liquefied petroleum gas (LPG), hydrogen, and fuels derived from biological materials (i.e., biomass).

2.1.2 Energy Consumption

Electricity and Natural Gas Consumption

Californians consumed 288,613 gigawatt hours (GWh) of electricity in 2017, which is the most recent year for which data is available.⁵ Of this total, the City of San Diego consumed 7,739 GWh.⁶

Californians consumed 12,571 million therms of natural gas in 2017.⁷ Of this total, the City of San Diego consumed 384 million therms of natural gas.⁸

⁴ U.S. Energy Information Administration. 2018. Petroleum & Other Liquids. Number and Capacity of Petroleum Refineries. Available online at: https://www.eia.gov/dnav/pet/PET_PNP_CAP1_DCU_SCA_A.htm. Accessed: May 2019.

⁵ A watt hour is a unit of energy equivalent to one watt of power expended for one hour. For example, a typical light bulb is 60 watts, meaning that if it is left on for one hour, 60-watt hours have been used. One kilowatt equals 1,000 watts. The consumption of electrical energy by homes and businesses is usually measured in kilowatt hours (kWh). Some large businesses and institutions also use megawatt hours (MWh), where one MWh equals 1,000 kWh. One gigawatt equals one thousand (1,000) megawatts, or one million (1,000,000) kilowatts. The energy output of large power plants over long periods of time, or the energy consumption of jurisdictions, can be expressed in gigawatt hours (GWh).

⁶ City of San Diego. 2018. Climate Action Plan 2018 Annual Report Appendix. Electricity Use (Grid-Supply Only). Available online at: https://www.sandiego.gov/sites/default/files/city_of_san_diego_appendix_for_2018_cap_annual_report_0.pdf. Accessed: July 2019.

⁷ A British Thermal Unit (BTU) is the amount of energy needed to raise the temperature of one pound of water by one degree Fahrenheit. A kBTU is 1,000 BTUs. A MMBtu is 1,000,000 BTUs. A therm is 100,000 BTUs.

⁸ City of San Diego. 2018. Climate Action Plan 2018 Annual Report Appendix. Total Natural Gas Use (Utility Only). Available online at: https://www.sandiego.gov/sites/default/files/city_of_san_diego_appendix_for_2018_cap_annual_report_0.pdf. Accessed: July 2019.

Transportation Sector Fuels Consumption

The transportation sector is a major end use of energy in California, accounting for approximately 39.8% of total statewide energy consumption in 2016, the most recent year for which data is available.⁹ In addition, energy is consumed in connection with construction and maintenance of transportation infrastructure, such as streets, highways, freeways, rail lines, and airport runways. California's 30 million vehicles consume more than 16 billion gallons of gasoline and more than 3 billion gallons of diesel each year.¹⁰

2.2 Regulatory Overview

2.2.1 Federal Programs

2.2.1.1 Energy Policy and Conservation Act

The Energy Policy and Conservation Act of 1975 was established in response to the oil crisis of 1973, which increased oil prices due to a shortage of reserves. The Act requires that all vehicles sold in the U.S. meet certain fuel economy goals, known as the Corporate Average Fuel Economy standards. The National Highway Traffic Safety Administration (NHTSA) of the U.S. Department of Transportation (DOT) administers the Corporate Average Fuel Economy program, and the U.S. Environmental Protection Agency (EPA) provides the fuel economy data.

In April 2010, the EPA and NHTSA issued a final rulemaking establishing new federal fuel economy standards for model years 2012 to 2016 passenger cars and light-duty trucks. For model year 2012, the fuel economy standards for passenger cars, light trucks, and combined cars and trucks were 33.3 miles per gallon (mpg), 25.4 mpg, and 29.7 mpg, respectively.¹¹ These standards increase progressively up to 37.8 mpg, 28.8 mpg, and 34.1, respectively, for model year 2016. In subsequent rulemakings, the agencies extended the national program of fuel economy standards to passenger vehicles and light-duty trucks of model years 2017-2025, culminating in fuel economy of 54.5 mpg by model year 2025,¹² as well as to medium- and heavy-duty vehicles of model years 2014-2018, including large pickup trucks and vans, semi-trucks, and all types and sizes of work trucks and buses.¹³

In August 2016, the EPA and NHTSA adopted the next phase (Phase 2) of the fuel economy and GHG standards for medium- and heavy-duty trucks, which apply to vehicles with model year 2018 and later.¹⁴ In response to the EPA's adoption of the Phase 2 standards, California

⁹ U.S. Energy Information Administration. 2016. California State Profile and Energy Estimates: California Energy Consumption by End-Use Sector, 2016. Available online at: <http://www.eia.gov/state/?sid=CA#tabs-2>. Accessed: May 2019.

¹⁰ California Energy Commission. 2016. Summary of California Vehicle and Transportation Energy. Available online at: http://www.energy.ca.gov/almanac/transportation_data/summary.html#vehicles. Accessed: July 2019.

¹¹ United States Environmental Protection Agency (EPA) and United States Department of Transportation (DOT). 2010. *Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards*. Final Rule. 75 Fed. Reg. 25324-25728.

¹² United States Environmental Protection Agency (EPA) and United States Department of Transportation (DOT). 2012. *2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards*; Final Rule. 77 Fed. Reg. 62623.

¹³ United States Environmental Protection Agency (EPA) and United States Department of Transportation (DOT). 2011. *Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles*. 76 Fed. Reg. 57106.

¹⁴ USEPA. Available at: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-greenhouse-gas-emissions-and-fuel-efficiency>. Accessed: July 2019.

Air Resources Board (ARB) staff brought a proposed California Phase 2 program before its Board in 2017; and the Board approved the program in March 2018.¹⁵

In 2018, the EPA and NHTSA proposed to amend certain existing Corporate Average Fuel Economy standards for passenger cars and light trucks and establish new standards, covering model years 2021-2026. Compared to maintaining the post-2020 standards now in place, the pending proposal would increase U.S. fuel consumption.¹⁶ California and other states have announced their intent to challenge federal actions that would delay or eliminate GHG reductions. Because the pending proposal is still in the rulemaking phase, and because legal challenges to any future adoption of the proposal is likely, the timing and consequences of the pending proposal are speculative at this time.

2.2.1.2 Energy Policy Act of 2005 and Energy Independence and Security Act of 2007

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Energy Policy Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products. Because driving fuel-efficient vehicles and installing energy-efficient appliances can provide many benefits, such as lower energy bills, increased indoor comfort, and reduced air pollution, businesses are eligible for tax credits for buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are given for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

The Energy Policy Act of 2005 also established the first renewable fuel volume mandate in the United States. The original Renewable Fuel Standard program required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. Under the Energy Independence and Security Act of 2007, the Renewable Fuel Standard program was expanded to include diesel and to increase the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022.

2.2.1.3 American Recovery and Reinvestment Act

The American Recovery and Reinvestment Act of 2009 was passed in response to the economic crisis of the late 2000s, with the primary purpose of maintaining existing jobs and creating new jobs. Among the secondary objectives of the American Recovery and Reinvestment Act was investment in “green” energy programs, including funding the following through grants, loans, or other mechanisms: private companies developing renewable energy technologies; local and state governments implementing energy efficiency and clean energy programs; research in renewable energy, biofuels, and carbon capture; and development of high efficiency or electric vehicles.¹⁷

¹⁵ ARB. CA Phase 2 GHG webpage: <http://www.arb.ca.gov/msprog/onroad/caphase2ghg/caphase2ghg.htm>. Accessed: July 2019.

¹⁶ Federal Register. 2018. *The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks*. Available at: <https://www.federalregister.gov/documents/2018/08/24/2018-16820/the-safer-affordable-fuel-efficient-safe-vehicles-rule-for-model-years-2021-2026-passenger-cars-and>. Accessed: May 2019.

¹⁷ United States Environmental Protection Agency (EPA). 2009. *Recovery: EPA Gets Involved*. Available at: <https://archive.epa.gov/recovery/web/html/>. Accessed: July 2019.

2.2.1.4 Intermodal Surface Transportation Efficiency Act

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 promotes the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. The Intermodal Surface Transportation Efficiency Act contains factors that metropolitan planning organizations (MPO), such as the San Diego Association of Governments (SANDAG), are to address in developing transportation plans and programs, including some energy-related factors. To meet the ISTEA requirements, MPOs have adopted explicit policies defining the social, economic, energy, and environmental values that guide transportation decisions in their respective metropolitan areas. The planning process for specific projects would then address these policies. Another requirement of the ISTEA is to consider the consistency of transportation planning with federal, state, and local energy goals. Through this requirement, energy consumption is expected to be a decision criterion, along with cost and other values to determine the best transportation solution.

2.2.1.5 Transportation Equity Act for the 21st Century

The Transportation Equity Act for the 21st Century ("TEA-21") was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

2.2.2 State Programs

2.2.2.1 AB 32 and SB 32 (Statewide GHG Reductions with Energy Co-Benefits)

The California Global Warming Solutions Act of 2006 (AB 32) was signed into law in September 2006.¹⁸ The law instructed ARB to develop and enforce regulations for the reporting and verification of state-wide GHG emissions. The bulk of GHG emissions in California are carbon dioxide that result from fossil fuel consumption. Therefore, a reduction in GHG emissions typically translates into reduced fuel and increased energy efficiency. The bill directed ARB to set a state-wide GHG emission limit based on 1990 levels, to be achieved by 2020.

AB 32 requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. In December 2008, ARB adopted its Climate Change Scoping Plan: A Framework for Change (Scoping Plan), which included the state's strategies for achieving AB 32's reduction targets. These strategies are implemented with additional rules and regulations of relevance to energy analysis, such as the Advanced Clean Cars Program, the low carbon fuel standard (LCFS), Title 24 building efficiency standards, and the RPS. These are discussed further below.

Enacted in 2016, Senate Bill (SB) 32 (Pavley, 2016) codifies a 2030 GHG emissions reduction goal and requires ARB to ensure that statewide GHG emissions are reduced to

¹⁸ ARB. Assembly Bill 32 Overview. 2006a. Available at: <http://www.arb.ca.gov/cc/ab32/ab32.htm>. Accessed: July 2019.

40 percent below 1990 levels by 2030. Similar to AB 32, a reduction in GHG emissions typically corresponds with a reduction in energy usage as the bulk of GHGs result from the combustion of fossil fuel.

2.2.2.2 2018 Integrated Energy Policy Report Update

The 2018 Integrated Energy Policy Report (IEPR) Update provides an assessment of major energy trends and issues for a variety of energy sectors, as well as policy recommendations.¹⁹ Prepared by the California Energy Commission (CEC), this report details the key energy issues facing California and develops potential strategies to address these issues. The 2018 IEPR Update includes a discussion of several strategies to reduce climate change impacts and lessen energy consumption and recommendations for each topic. Examples include a discussion of building decarbonization, strategies to increase energy efficiency, discussion of energy equity, and the impacts of increasing the flexibility of the electricity system. The assessments and forecasted energy demand within this report will be used by the CEC to develop future energy policies.

2.2.2.3 Title 24 Building Energy Efficiency Standards

The 2016 California Green Building Standards Code, as specified in Title 24, Part 11 of the California Code of Regulations, commonly referred to as CalGreen Building Standards (CalGreen), establishes voluntary and mandatory standards to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in five categories: planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. The provisions of this code apply to the planning, design, operation, construction, replacement, use and occupancy, location, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such building structures throughout California. Examples of CalGreen provisions include reducing indoor water use, moisture sensing irrigation systems for landscaped areas, construction waste diversion goals, and energy system inspections. CalGreen is periodically amended; the most recent 2016 standards became effective on January 1, 2017.

The Energy Efficiency Standards for Residential and Nonresidential Buildings, as specified in Title 24, Part 6, of the California Code of Regulations, were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods for building features such as space conditioning, water heating, lighting, and whole envelope. The 2005, 2008, and 2013 updates to the efficiency standards included provisions such as cool roofs on commercial buildings, increased use of skylights, and higher efficiency lighting, HVAC, and water heating systems. Additionally, some standards focused on larger energy saving concepts such as reducing loads at peak periods and seasons and improving the quality of such energy-saving installations. Past updates to the Title 24 standards have proven very effective in reducing building energy use, with the 2013 update estimated to reduce energy consumption in residential buildings by 25% and energy consumption in commercial buildings by 30%, relative to the 2008

¹⁹ California Energy Commission. 2018. 2018 Integrated Energy Policy Report Update. Available at: https://www.energy.ca.gov/2018publications/CEC-100-2018-001/Exec_Sumry_CEC-100-2018-001-V2-CMF.pdf. Accessed: May 2019.

standards.²⁰ The 2016 updates include additional high efficiency lighting requirements, high performance attic and walls, and higher efficiency water and space heaters. The currently applicable 2016 standards are expected to reduce residential electricity consumption by 28% and non-residential electricity by 5%.²¹ The CEC has developed and adopted 2019 standards, which will go into effect on January 1, 2020.

Given that the 2019 standards will be in effect at the time construction of the proposed project begins, at a minimum, initial phases of project building construction will be subject to the 2019 standards. Over the course of project buildout, future Title 24 standards are likely to apply as the standards are triggered by the filing of building permit applications. Notably, the data needed to quantitatively account for the 2019 standards (or the post-2019, future standards) is not yet available at the time this analysis was prepared, and so the 2016 standards are used in this analysis. As previously discussed, this serves to conservatively over-estimate project energy consumption.

2.2.2.4 Renewables Portfolio Standard

SB 1078 (2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to obtain at least 20 percent of their energy supply from renewable sources by 2017. SB 107 (2006) changed that target date to 2010. In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expanded the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. In April 2011, then-Governor Brown signed SB 2X, which legislated the prior Executive Order S-14-08 renewable standard. SB 350 (2015) set an additional RPS goal of 50 percent renewables by 2030. And, SB 100 (2018) accelerated and extended again the RPS – requiring achievement of a 50 percent RPS by 2026 and a 60 percent RPS by 2030. SB 100 also established a state policy goal to achieve 100 percent renewables by 2045.

2.2.2.5 Mobile Source Regulations

SB 743 (Transportation Analysis under CEQA)

Public Resources Code Section 21099(c)(1), as codified through enactment of SB 743, was enacted with the intent to change the focus of transportation analyses conducted under the California Environmental Quality Act (CEQA). SB 743 reflects a legislative policy to balance the needs of congestion management with statewide goals related to infill development, promotion of public health through active transportation, and reduction of GHG emissions. As finalized in December 2018, amendments to the State CEQA Guidelines adopted in furtherance of SB 743 establish vehicle miles travelled (VMT), in lieu of level of service, as the new metric for transportation analysis. Implementation of SB 743 is anticipated to improve the efficiency of transportation fuels consumption.

SB 375 (Land Use Planning)

SB 375, the Sustainable Communities and Climate Protection Act of 2008, supports the State's climate action goals to reduce GHG emissions through coordinated transportation and land use planning. SB 375 required ARB to establish GHG emission reduction targets (Regional Targets) for each metropolitan planning region. On September 23, 2010, ARB

²⁰ CEC. 2012. Energy Commission Approves More Efficient Buildings for California's Future. Available at: https://energyarchive.ca.gov/releases/2012_releases/2012-05-31_energy_commission_approves_more_efficient_buildings_nr.html. Accessed: May 2019.

²¹ CEC. 2015. 2016 Building Energy Efficiency Standards Adoption Hearing. Available at: http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2015-06-10_hearing/2015-06-10_Adoption_Hearing_Presentation.pdf. Accessed: May 2019.

adopted Regional Targets applying to the years 2020 and 2035. In 2011, ARB adopted Regional Targets of 7% for 2020 and 13% for 2035 for the area under the jurisdiction of SANDAG. These targets were in place through September 30, 2018. In March 2018, ARB approved updated regional targets of 15% for 2020 and 19% for 2035 for SANDAG, which will be applied by SANDAG in future planning cycles.

SB 375 requires MPOs, including SANDAG, to incorporate a “sustainable communities strategy” (SCS) in their regional transportation plans (RTPs) that will achieve the GHG emission Reduction Targets set by ARB, primarily by reducing VMT from light-duty vehicles through development of more compact, complete, and efficient communities. SANDAG prepared San Diego Forward²² to fulfill this requirement; and, the ARB accepted SANDAG’s GHG quantification demonstration for that plan.

Clean Cars

In January 2012, ARB approved the Advanced Clean Cars Program, which established an emissions control program for cars and light-duty trucks (such as SUVs, pickup trucks, and minivans) of model years 2017-2025. When the program is fully implemented, new vehicles would emit 75% less smog-forming pollutants than the average new car sold today, and greenhouse gas emissions would be reduced by nearly 35%. This Program would help reduce fossil fuel usage for internal combustion engine powered vehicles.

Commercial Motor Vehicle Idling Regulation

In July 2004, ARB initially adopted an Airborne Toxic Control Measure (ATCM) to limit idling of diesel-fueled commercial motor vehicles (idling ATCM) and subsequently amended it in October 2005, October 2009, and December 2013. This ATCM is set forth in Title 13, California Code of Regulations, Section 2485, and requires, among other things, that drivers of diesel-fueled commercial motor vehicles with gross vehicle weight ratings greater than 10,000 pounds, including buses and sleeper berth equipped trucks, not idle the vehicle’s primary diesel engine longer than five minutes at any location. This anti-idling regulation helps to reduce fuel consumption by reducing engine usage. The ATCM also requires owners and motor carriers that own or dispatch these vehicles to ensure compliance with the ATCM requirements. The regulation consists of new engine and in-use truck requirements and emission performance requirements for technologies used as alternatives to idling the truck’s main engine. Under the new engine requirements, 2008 and newer model year heavy-duty diesel engines need to be equipped with a non-programmable engine shutdown system that automatically shuts down the engine after five minutes of idling or optionally meet a stringent oxides of nitrogen idling emission standard.

In-Use Off-Road Diesel Fueled Fleets Regulation

In May 2008, ARB approved the In-Use Off-Road Diesel Fueled Fleets Regulation (Off-Road Regulation), which was later amended in December 2009, July 2010, and December 2011. The overall purpose of the Off-Road Regulation is to reduce emissions of oxides of nitrogen (NO_x) and particulate matter (PM) from off-road diesel vehicles operating within California. The regulation applies to all self-propelled off-road diesel vehicles 25 horsepower (hp) or greater used in California and most two-engine vehicles. The Off Road Regulation:

²² San Diego Forward: The Regional Plan 2019-2050. Available at: <http://www.sdfoward.com/>. Accessed July 2019.

- Imposes limits on idling (i.e., fleets must limit unnecessary idling to 5 minutes), requires a written idling policy, and requires a disclosure when selling vehicles;
- Requires all vehicles to be reported to ARB (using the Diesel Off-Road Online Reporting System, DOORS) and labelled;
- Restricts the adding of older vehicles into fleets starting on January 1, 2014; and
- Requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (VDECS) (i.e., exhaust retrofits).

The anti-idling component of this Off-Road Regulation helps to reduce fuel consumption by reducing engine usage.

Tractor-Trailer Greenhouse Gas Regulation

ARB's Tractor-Trailer Greenhouse Gas regulation reduces the energy consumption of large trucks. ARB developed this regulation to make heavy-duty tractors more fuel efficient. Fuel efficiency is improved by requiring the use of aerodynamic tractors and trailers that are also equipped with low rolling resistance tires. The tractors and trailers subject to this regulation must either use EPA's SmartWay (SmartWay) certified tractors and trailers, or retrofit their existing fleet with SmartWay verified technologies. The SmartWay certification process is part of their broader voluntary program called the SmartWay Transport Partnership Program. The regulation applies primarily to owners of 53-foot or longer box-type trailers, and owners of the heavy-duty tractors that pull them on California highways. These owners are responsible for replacing or retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. All owners regardless of where their vehicle is registered must comply with the regulation when they operate their affected vehicles on California highways. Besides the owners of these vehicles, drivers, motor carriers, California-based brokers and California-based shippers that operate or use them also share in the responsibility for compliance with the regulation.

2.2.3 Local Programs

As a state agency, CSU/SDSU is not subject to local land use regulatory/planning documents, ordinances, regulations, policies, rules, fees, or exactions such as those described herein. However, CSU is willing to purchase the project site pursuant to the framework set forth in SDMC Section 22.0908 and the Purchase and Sale Agreement, in order to implement the overriding purpose of the proposed project. In addition, CSU will evaluate the proposed project's consistency with adopted, applicable state and federal regulatory/planning documents; and, though not required by law, CSU also will consider the proposed project's consistency with adopted, applicable local regulatory/planning documents.

2.2.3.1 City of San Diego General Plan

The Conservation Element of the City of San Diego's General Plan²³ includes the following energy-related policies that are applicable to the SDSU Mission Valley Campus Master Plan proposed project.

Policy CE-A.5: Employ sustainable or "green" building techniques for the construction and operation of buildings.

²³ City of San Diego. 2008. *City of San Diego General Plan*. Adopted March 10, 2008. Available at: <https://www.sandiego.gov/planning/genplan#genplan>. Accessed: July 2019.

- a. Develop and implement sustainable building standards for new and significant remodels of residential and commercial buildings to maximize energy efficiency, and to achieve overall net zero energy consumption by 2020 for new residential buildings and 2030 for new commercial buildings. This can be accomplished through factors including, but not limited to:
 - Designing mechanical and electrical systems that achieve greater energy efficiency with currently available technology
 - Minimizing energy use through innovative site design and building orientation that addresses factors such as sun-shade patterns, prevailing winds, landscape, and sun-screens
 - Employing self-generation of energy using renewable technologies
 - Combining energy efficient measures that have longer payback periods with measures that have shorter payback periods
 - Reducing levels of non-essential lighting, heating and cooling
 - Using energy efficient appliances and lighting.
- b. Provide technical services for “green” buildings in partnership with other agencies and organizations.

Policy CE-I.3: Pursue state and federal funding opportunities for research and development of alternative and renewable energy sources.

Policy CE-I.4: Maintain and promote water conservation and waste diversion programs to conserve energy.

Policy CE-I.5: Support the installation of photovoltaic panels, and other forms of renewable energy production.

- a. Seek funding to incorporate renewable energy alternatives in public buildings.
- b. Promote the use and installation of renewable energy alternatives in new and existing development.

Policy CE-I.7: Pursue investments in energy efficiency and direct sustained efforts towards eliminating inefficient energy use.

Policy CE-I.10: Use renewable energy sources to generate energy to the extent feasible.

Policy CE-I.12: Use small, decentralized, aesthetically-designed, and appropriately sited energy efficient power generation facilities to the extent feasible.

2.2.3.2 City of San Diego Energy Strategy for a Sustainable Future

The City of San Diego Environmental Services Department has taken a leadership role to advance policies and practices that support a more sustainable future. In June 2009, the Department published its Energy Strategy for a Sustainable Future, which outlines six objectives to achieve more sustainable generation and use of energy, as follows²⁴ (City of San Diego 2009):

²⁴ City of San Diego. 2009. *City of San Diego’s Energy Strategy for a Sustainable Future*. June. Available at: <https://www.sandiego.gov/sites/default/files/legacy/environmental-services/pdf/sustainable/090600energystrategy.pdf>. Accessed: July 2019.

- Energy Conservation – All City employees will be aware of and implement energy conservation measures by 2010.
- Energy Efficiency – Reduce energy use 10% by 2012, using 2000 as a baseline.
- Renewable Energy – Increase megawatts of renewable energy used at City facilities to 17 by 2012, and to 25 by 2020.
- Management of SDG&E Energy Bills – Continue the use of the Electronic Data Interchange.
- Policy Development and Implementation – Guide City efforts by institutionalizing policies and programs that increase energy conservation, efficiency, and the use of renewable energy.
- Leverage Resources – Ensure that state and federal funds are leveraged to the extent possible with existing programs such as CEC loans and the CPUC Partnership funds.

2.2.3.3 City of San Diego Climate Action Plan

The City of San Diego's Climate Action Plan (CAP) and CAP checklist are the guiding documents that will be used to demonstrate consistency with the City's energy goals.^{25, 26} The CAP identifies five strategies to address GHG emissions. Of these five strategies, three have direct implications to the energy demand of the proposed project: 1. Energy and Water Efficient Buildings, 2. Clean & Renewable Energy, and 3. Bicycling, Walking, Transit & Land Use. Actions within each of these strategies are expected to reduce the overall energy demand of the proposed project:

- Strategy 1: Energy and Water Efficient Buildings
 - 1.1 Residential Energy Conservation and Disclosure Ordinance
- Strategy 2: Clean and Renewable Energy
 - 2.1 Community Choice Aggregation Program or Another Program
- Strategy 3: Bicycling, Walking, Transit & Land Use
 - 3.1 Mass Transit
 - 3.2 Commuter Walking
 - 3.3 Commuter Biking
 - 3.6 Promote Effective Land Use to Reduce Vehicle Miles Traveled

These actions support the overarching goals that the City is striving to achieve. The CAP Checklist provides more targeted guidance to evaluate a project's consistency with the applicable CAP strategies and actions. The targeted guidance that impacts energy include:

- Strategy 1: Energy and Water Efficient Buildings
 - 1. Cool/Green roofs

²⁵ City of San Diego. Climate Action Plan. 2015. Available at: https://www.sandiego.gov/sites/default/files/final_july_2016_cap.pdf. Accessed July 2019.

²⁶ City of San Diego. Climate Action Plan Checklist. 2017. Available at: https://www.sandiego.gov/sites/default/files/city_of_san_diego_cap_checklist.pdf. Accessed July 2019.

- Strategy 2: Clean & Renewable Energy
 - The CAP Checklist does not provide additional targeted guidance for this strategy.
- Strategy 3: Bicycling, Walking, Transit & Land Use
 - 3. Electric Vehicle Charging
 - 4. Bicycle Parking Spaces
 - 6. Designated Parking Spaces
 - 7. Transportation Demand Management Program

2.2.3.4 Mission Valley Community Plan

The Mission Valley Community Plan (MVCP) is intended to be a blueprint for future development in the Mission Valley community of San Diego, where the proposed project is located. The final draft of the MVCP Update was released on May 31, 2019.²⁷ The MVCP contains Design Guidelines and Policies for Development to implement the City's CAP, maximize transit ridership, and increase mobility options, among others. While the draft MVCP has not yet been adopted by the City of San Diego, it is considered in this analysis.

²⁷ Mission Valley Community Plan. Final Draft. 2019. Available at: <https://www.sandiego.gov/planning/community/cpu/missionvalley>. Accessed: July 2019.

3. SIGNIFICANCE THRESHOLDS

The analysis provided in this report evaluates the significance of the Project's energy by reference to the following questions from Section VI, Energy, of Appendix G of the CEQA Guidelines:

- Threshold 1.** Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?
- Threshold 2.** Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

While no quantitative thresholds related to energy are included in the CEQA Guidelines, Part I of Appendix F of the CEQA Guidelines states as follows:

"The goal of conserving energy implies the wise and efficient use of energy. 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 resources."

Appendix F states that an Environmental Impact Report (EIR) should include a discussion of the potential energy impacts of a project, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

For purposes of this analysis, impacts to energy resources will be considered to be significant if the project would result in the wasteful, inefficient or unnecessary consumption of fuel or energy, and conversely if the project would not incorporate renewable energy or energy efficiency measures into building design, equipment use, transportation or other project features.

To determine whether a project would result in the wasteful, inefficient or unnecessary consumption of fuel or energy, and conversely whether the project would fail to incorporate renewable energy or energy efficiency measures into building design, equipment use, transportation or other project features, Appendix F of the CEQA Guidelines identifies six categories of potential energy-related environmental impacts:

1. 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 may be discussed.
2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
3. The effects of the project on peak and base period demands for electricity and other forms of energy.
4. The degree to which the project complies with existing energy standards.
5. The effects of the project on energy resources.
6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

This report, relative to Threshold 1, assesses the project's electricity, natural gas, and fossil fuel consumption during construction and operation by way of the six questions above. This report, relative to Threshold 2, evaluates the project for consistency with applicable plans related to renewable energy and energy efficiency (see **Appendix A**, Local Plan-Level Consistency Analysis, and **Appendix B**, State Plan-Level Consistency Analysis).

4. METHODOLOGY FOR DEVELOPMENT OF ENERGY PROJECTIONS

This section describes the methodology that Ramboll used to develop the regulatory compliance-based energy projections associated with the proposed project, which include one-time demand from construction and annual operational demand. This section also identifies the results of the energy projections for the proposed project based on compliance with applicable regulatory requirements; energy conservation and efficiency benefits associated with relevant PDFs are discussed in later sections of this report.

As to operational demand, this report evaluates the energy consumption for complete buildout of the proposed project, which is estimated to be realized in calendar year 2037. Because various aspects of the applicable regulatory environment do not perfectly align with the 2037 year of study, to be conservative, regulatory inputs from earlier calendar years are utilized. For example, the adopted 60 percent RPS for 2030 is utilized. Similarly, the model used to identify energy consumption rates (CalEEMod®) allows for operational years up to 2035; therefore, the mobile emission factors used in this analysis are based on values from EMFAC2014 incorporated into CalEEMod® for calendar year 2035. Mobile emission factors tend to decrease into the future as vehicles are assumed to become more efficient; thus, mobile emissions are conservatively assessed. In addition, the building energy also is conservatively assessed as it is based on the current building code. As previously discussed, California revises its building energy standards (as set forth in Title 24 of the California Code of Regulations) on a periodic basis. California's building codes are published in their entirety every three years. Intervening Code Adoption Cycles produce Supplement pages half-way (18 months) into each triennial period. The next Title 24 code to be published is the 2019 Code; the corresponding building energy standards were adopted in May 2018 and will take effect in January 2020. Each subsequent building code has required more energy efficiency than the previous codes. Accordingly, because this analysis is based on current codes, it necessarily will result in an overestimate of actual energy usage in buildings.

Additional information regarding methodology can be found in the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the proposed project; only the methodology specific to energy usage is discussed in this report.

4.1 Construction Equipment & Activities

Project construction will begin in 2020, with full build out expected in 2037.

Construction of the proposed project would result in electricity demand, such as due to the use of power tools (e.g., drills). However, this electricity demand is supplied by generator sets that are powered by fuels and thus no additional electricity is required. Construction of the proposed project is not anticipated to require natural gas. As such, electricity and natural gas related to construction of the proposed project are not discussed further.

Construction of the proposed project requires the use of transportation fuel, including gasoline and diesel use in construction equipment, hauling trucks, and construction worker vehicles. Fuel consumed by construction equipment would be the primary energy resource expended over the course of construction, while VMT associated with the transportation of construction materials and construction worker commutes would also result in fuel consumption. Heavy-duty construction equipment and haul trucks associated with construction activities would use diesel fuel. Construction workers would travel to and from

the project site throughout the duration of construction; this analysis assumed that construction workers would primarily use gasoline-powered passenger vehicles.

Heavy-duty construction equipment of various types would be used during each phase of construction. CalEEMod[®] was used to estimate construction equipment usage, and results are included in the appendices to the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the proposed project. Fuel consumption from construction equipment was estimated by converting the total carbon dioxide (CO₂) emissions from each construction phase to gallons using conversion factors for CO₂ to gallons of gasoline or diesel. The estimated diesel fuel usage from off-road construction equipment, which totals 2,318,597 gallons of diesel over the course of the project construction period, is shown in **Table 4-1**.

This analysis assumes that implosion would be used for stadium demolition. If implosion is not used, some additional pieces of off-road construction equipment would be required during the demolition phase. However, total fuel usage from all off-road construction equipment over the entire construction period (2020-2037) is expected to be similar to those presented in **Table 4-1**.

Fuel consumption from worker and vendor trips are estimated by converting the total CO₂ emissions from each construction phase to gallons using conversion factors for CO₂ to gallons of gasoline or diesel. Worker vehicles are assumed to be gasoline-fueled, and vendor/hauling vehicles are assumed to be diesel-fueled. Estimated fuel usage, which totals 202,643 gallons of gasoline and 623,739 gallons of diesel over the course of the project construction period, is shown in **Table 4-2**.

4.2 Energy Sources

4.2.1 Electricity

Operation of the proposed project would result in electricity demand for the proposed new buildings. The annual electricity usage for the existing stadium, as well as for the proposed project (new mixed-use campus, research park, and stadium), are based on the CalEEMod[®] default for land uses in climate zone 13 assuming regulatory requirements.

Total electricity use was estimated to be 4,660,920 kWh for the existing stadium (based on a review of meter readings) and 72,720,415 kWh for the proposed project (based on use of CalEEMod[®] parameters). The energy usage calculation for the project shown in **Table 4-3** conservatively reflects application of the 2016 Title 24 standards, even though the 2019 Title 24 standards and subsequent updates thereto will apply given the project's construction timeline and will serve to further reduce project energy consumption.²⁸

Additional information and tables regarding electricity usage estimates can be found in the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the proposed project.

4.2.2 Natural Gas

Operation of the proposed project requires natural gas, mainly for building heating and hot water. Natural gas is imported for on-site use and is estimated using CalEEMod[®] defaults

²⁸ Energy intensiveness of materials is not addressed because the California Governor's Office of Planning and Research has explained that "a full 'lifecycle' analysis that would account for energy in building materials and consumer products will generally not be required." Such an analysis runs a substantial risk of double counting energy use and associated greenhouse gas emissions. 2015. Preliminary Discussion Draft. OPR, Proposed Updates to the CEQA Guidelines.

based on averages for the climate zone for the existing conditions, as well as proposed project buildout. Natural gas usage was estimated to be 1,822,990 kBtu for the existing stadium (based on a review of meter readings) and 102,012,852 kBtu for the Project (based on use of CalEEMod® parameters) as shown in **Table 4-4**. As discussed above, estimates for the project are conservative because they assume the project would be built to existing Title 24, Part 6 standards, even though subsequent, more energy efficient iterations of the code will apply.

Additional information and tables regarding natural gas usage estimates can be found in the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the proposed project.

4.3 Fuel Usage

Operation of the proposed project requires the use of fuel due to students, faculty, staff, attendees, residents, workers, and delivery vehicles associated with the new mixed-use campus, research park, and stadium development. Activity data (number of trips and/or VMT) for existing conditions and the proposed project was provided by Fehr & Peers. Data from Fehr & Peers is provided in the Transportation Impact Analysis (TIA).²⁹ Fuel usage was estimated using an average mpg obtained from EMFAC2014 for the fleet mix corresponding to the vehicle category and fuel type (gasoline or diesel).

Mobile gasoline fuel usage was estimated to be 198,367 gallons/yr for the existing condition and 5,263,459 gallons/yr for the proposed project buildout, with the totals shown in **Table 4-5**.

Additional information and tables regarding VMT calculations can be found in the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the proposed project.

The proposed project will include 1 diesel generator that will provide emergency lighting and power for the new multipurpose stadium in the event of a power failure. Diesel fuel usage results from generator operation for testing and maintenance, and for emergency operation. Activity data (hours of operation, including some emergency usage) for stationary source diesel fuel consumption was based on one hour per week of operation for testing and maintenance emergency usage.

Diesel fuel usage from mobile and stationary sources was estimated to be 23,476 gallons/yr for the existing condition and 1,014,587 gallons/yr for the proposed project buildout as shown in **Table 4-6**.

Additional details on fuel consumption rate and hours of operation can be found in the **Greenhouse Gas Emissions Technical Report and Air Quality Technical Report** for the proposed project.

²⁹ 2019. Fehr & Peers. SDSU Mission Valley Campus Project Transportation Impact Analysis.

5. PROJECT DESIGN FEATURES

This section describes the project design features that go beyond existing regulatory requirements.

5.1 Description of Project Design Features

The energy conservation benefits of four PDFs have been quantified in this report:

Solar Photovoltaic (PV) Panels

The proposed project is incorporating solar PV panels on available roof space with a total generation capacity equivalent to 10,819,478 kWh of electricity, or 14.9% of the proposed project's total project electricity demand (**Table 5-1**).

Electric Vehicle (EV) Ready Infrastructure and EV Chargers

The proposed project is equipping 3% of total residential parking spaces and 6% of total non-residential parking spaces with appropriate electric supply equipment to allow for the future installation of EV chargers (i.e., "EV ready"). Of these EV ready spaces, 50% will be equipped with EV charging stations. In total, approximately 500 spaces will be designated as "EV ready" and 252 of the "EV ready" spaces will be equipped with operable EV charging stations (**Table 5-2**).

TDM Program

The project's Transportation Demand Management (TDM) Program incentivizes alternative transportation besides single commuter trips. The TDM Program consists of the following:

- Land Use Diversity
- Neighborhood Site Enhancement
 - New Bicycle Facilities
 - Dedicated Land for Bicycle/Multi-Use Trails
 - Bicycle Parking
 - Showers and Lockers in Employment Areas
 - Increased Intersection Density
 - Traffic Calming
 - Car Share Service Accommodations
 - Enhanced Pedestrian Network
- Parking Policy and Pricing
 - Unbundled Residential Parking
 - Metered On-Street Parking
 - Reduced Parking Supply
- Commute Trip Reduction Services
 - TDM Program Coordinator and Marketing
 - Electric Bike-Share Accommodations

- Ridesharing Support
- School Pool
- Hotel Shuttle Service

The TDM Program strategies described above apply to the project's campus office, residential and retail uses. The TDM Program's strategies for non-stadium land uses are expected to reduce VMT and the corresponding consumption of gasoline by 14.41% (**Table 5-2**).

TDM Program strategies also have been developed exclusively for the project's stadium land use that are not listed here, as they are not quantitatively accounted for in this analysis (see below). For additional information on the project's TDM Program, with respect to both stadium and non-stadium uses, please see Fehr & Peers' Transportation Impact Analysis (2019) for the project.

Residential Hearths

The proposed project is incorporating a limited number of natural gas fireplaces, and no wood-burning fireplaces, within project residences. Of all residential units in the project, up to 5% of the units may include a natural gas fireplace.

Other PDFs with energy conservation benefits that have not been quantified in this report and only are considered qualitatively include:

- The layout of the project's development areas has been designed to maximize the unique infill opportunity presented at this Mission Valley location. This includes benefits from the existing Metropolitan Transit System's Green Line transit station that runs through the project as well as the planned Purple Line transit station.
- The mixed-use development locates buildings in close proximity to one another, which would facilitate the use of common heating/cooling sources, where feasible, as project-level development proceeds. (The use of common heating/cooling sources will be evaluated as the building plans for individual development parcels are developed; relevant factors that will influence the use of such sources include the temporal proximity of development, type of use, and market forces.)
- Project development areas would maximize natural ventilation.
- The proposed project integrates extensive parks and landscaping, including the planting of new, on-site trees to minimize heat gain.
- The proposed project would include adaptive lighting controls, where appropriate and feasible, in order to maximize energy efficiency and minimize light pollution.
- The proposed project would achieve LEED Version 4 at a Silver or better certification level, as well as a Neighbourhood Development designation for sitewide design. LEED certification is based on standards that encourage the development of energy-efficient and sustainable buildings.
- Events at the proposed project's multipurpose stadium would benefit from implementation of TDM Program strategies specifically developed for application to stadium-related events. These strategies focus on the use of alternative modes of transportation, including transit, to reduce single-occupancy vehicle usage and parking demand on event days.

6. PROJECT INVENTORY IN CONTEXT

This section assesses the significance of the proposed project's energy demand for purposes of CEQA. The analysis includes the PDFs related to energy, as set forth in Section 6 of this report.

6.1 Threshold 1

Would the Project Result in a Potentially Significant Environmental Impact Due to Wasteful, Inefficient, or Unnecessary Consumption of Energy Resources, during Project Construction or Operation?

6.1.1 Energy Requirements and Energy Use Efficiencies

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

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 may be discussed.

6.1.1.1 Construction

Construction of the proposed project would result in fuel usage as shown in **Tables 4-1 and 4-2**. There are no unusual project characteristics or construction processes that would require the use of equipment that would be more energy intensive than is used for comparable activities, or equipment that would not conform to current emissions standards (and related fuel efficiencies). In fact, the construction plan is designed to minimize fuel usage, for example and where possible, by using demolition debris onsite for fill and thereby avoiding hauling trips associated with (i) disposal of debris and (ii) importing soil needed for fill.

6.1.1.2 Operations

Electricity

Operation of the proposed project with the PDFs set forth in Section 5 of this report would result in electricity demand of 61,900,937 kWh per year (**Table 6-1**).

As shown in **Table 6-1**, operational electricity increases from the baseline condition to the proposed project condition. However, the new multipurpose stadium will result in less electricity demand per service population than the existing stadium (see **Table 4-3**), and thus the increase in electricity demand is primarily due to the new buildings that are part of the proposed project. The proposed project will also include electricity saving features, some of which have a quantifiable impact on the energy demand. Specifically, the proposed PDF of onsite renewable energy generation reduces the electricity demand. The MVCP recommends on-site energy generation for projects within the Mission Valley. The proposed project has committed to installing on-site rooftop solar PV, which is expected to offset approximately 14.9% of the electricity demands of the project. Onsite solar rooftop areas were selected based on orientation, roof size and slope, and construction.

Electricity usage per service population is expected to decrease with the proposed PDFs (as shown in **Table 6-1**).

As discussed in connection with the plan-level consistency analysis provided below, the proposed project also includes other PDFs which have not been quantified but are expected to result in lower electricity usage. These plans include the City of San Diego CAP and MVCP, which include measures and design guidelines to increase energy efficiency in the region. As discussed in **Section 2.2.3** and evaluated in **Appendix A**, the proposed project is consistent with these guidelines. Additional details of the energy system are discussed in **Section 4.2** above.

For example, the proposed project's overall energy demand will be reduced by incorporating natural daylighting and green roofs. The proposed project also will be designed to achieve LEED Version 4 at a Silver or better certification level (extending to individual buildings, including the stadium, on the project site, and also includes a Neighborhood Development designation for sitewide design), which may also drive additional energy efficiency in design. These measures will result in less electricity usage by the proposed project, although they have not been quantified. In addition, estimated energy demand assumed the California Building Energy Efficiency Standards (Title 24, Part 6) in effect at the time this analysis was performed (i.e., 2016 standards); a new version of these standards will become effective in January 2020 and is expected to result in lower electricity usage in new buildings. Application of the Title 24 2019 standards to current energy demand is anticipated to result in a 78.7% reduction in electricity consumption for low-rise multi-family housing.³⁰ Therefore, the electricity demand, as well as the electricity usage per service population, is expected to be less than predicted here.

Natural Gas

Operation of the proposed project requires natural gas, mainly for building heating and hot water, resulting in natural gas demand of 102,012,852 kBtu per year (**Table 4-4**). As shown in **Table 4-4**, operational natural gas demand increases from the baseline condition to the proposed project condition. However, the increase in natural gas is primarily due to the new buildings that are part of the proposed project.

As discussed in connection with the plan-level consistency analysis provided below, the proposed project includes other measures which have not been quantified but are expected to result in lower natural gas usage. For example, the proposed project's overall energy demand will be reduced by incorporating operable windows, building materials that serve as insulators/conductors, and efficient heating, ventilation, and air conditioning (HVAC) systems. The proposed project's LEED Silver Certification may also drive additional energy efficiency in design. These measures will result in less natural gas usage by the proposed project, although they have not been quantified.

As described in **Section 6.1.1.2** above, estimated energy demand assumed the California Building Energy Efficiency Standards (Title 24, Part 6) in effect at the time this analysis was performed (i.e., 2016 standards) and a new version of these standards will become effective in January 2020. Application of the Title 24 2019 standards to current energy demand is anticipated to result in a 4.7% reduction in natural gas use for low-rise multi-family housing. Therefore, natural gas demand, as well as the natural gas demand per service population, is expected to be less than predicted here.

³⁰ California Energy Commission. 2018. 2019 Update to the California Energy Efficiency Standards for Residential and Non-Residential Buildings. Available at: https://www.energy.ca.gov/title24/2019standards/post_adoption/documents/2019_Impact_Analysis_Final_Report_2018-06-29.pdf. Accessed: May 2019.

Fuel Usage

Operation of the proposed project with the PDFs set forth in **Section 5** of this report would result in gasoline consumption as shown in **Table 6-2**. Operational gasoline consumption increases from the baseline condition to the proposed project condition. However, the new stadium will result in less fuel usage than the existing stadium, and thus the increase in fuel usage is primarily due to the new buildings that are part of the proposed project. The proposed project will also include features that reduce fuel usage, some of which have a quantifiable impact on the fuel usage. Specifically, the proposed project's TDM Program, installation of EV chargers, and design to enhance the existing public transit options reduce the fuel usage associated with the project. Fuel usage per service population is expected to decrease with the PDFs as shown in **Table 6-2**.

Operation of the proposed project would result in diesel consumption as shown in **Table 4-6**. There are no unusual project characteristics that would require diesel consumption that would be more energy intensive than is used for comparable activities, or equipment that would not conform to current emissions standards (and related fuel efficiencies).

Over the lifetime of the project, the fuel efficiency of the vehicles being used by the visitors, employees, and event attendees is expected to improve. The amount of fuel consumption from vehicular trips to and from the project site during operation would correspondingly decrease over time as vehicles become more efficient. Numerous regulations have been adopted that encourage, and require, increased fuel efficiency. For example, ARB has adopted an approach to passenger vehicles that combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of standards. The approach also includes efforts to support and accelerate the numbers of plug-in hybrids and zero-emissions vehicles in California.³¹ As such, operation of the proposed project is expected to use decreasing amounts of fuel over time, due to advances in fuel economy.

6.1.1.3 Summary

Despite the projected increase in electricity, natural gas, and fuel usage compared to the baseline, the overall energy use requirements expressed per service population decrease with the PDFs discussed above. This conclusion is reached even while projecting forward electricity and natural gas demand based on current energy use profiles. This is a conservative estimate because anticipated building code updates will allow for further improvements in efficiency to be realized. Even without incorporating these additional energy efficiency improvements, resulting energy use from implementation of the proposed project is not wasteful or unnecessary, and shows efficiencies gained on a per service population basis. The proposed project's potential impacts with respect to energy requirements and energy use efficiencies are less than significant.

Additionally, the proposed project would develop residential and non-residential land uses in an infill setting that is served by multi-modal transportation options (trolley and bus) and would further enhance other multi-modal options by designing the site to encourage pedestrian- and bicycle-oriented connectivity. This is discussed further in **Section 6.1.6**.

³¹ ARB. 2013. Clean Car Standards – Pavley, Assembly Bill 1493. Available at: <https://arb.ca.gov/cc/ccms/ccms.htm>. Accessed: July 2019.

6.1.2 Local and Regional Energy Supplies

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

The effects of the project on local and regional energy supplies and on requirements for additional capacity.

6.1.2.1 Construction

The proposed project's fuel consumption during construction, which is expected to last 209 months, is discussed in **Section 4.1**. For comparison, based on 2017 consumption, construction of the proposed project would equate to less than 0.71% of the total amount of diesel and less than 0.002% of the total amount of gasoline that would be used citywide during the course of the construction period (**Table 6-3**). Construction of the proposed project would equate to less than 0.005% of the total amount of diesel and less than 0.0001% of the total amount of gasoline that would be used statewide during the course of the construction period (**Table 6-3**). Therefore, fuel use during construction would be temporary and negligible.

6.1.2.2 Operations

Electricity

The proposed project's electricity demand during operation is discussed in **Section 4.2.1**. For comparison, based on 2017 consumption, operation of the proposed project would equate to less than 0.8% of the total electricity demand citywide and less than 0.03% of the total electricity demand statewide (**Table 6-4**). Therefore, the proposed project is not expected to have an impact on the local utility and, due to the energy efficiency measures designed into the project, would not result in a wasteful use of energy.

In 2017, total in-state electric generation, not including small-scale solar installations, was 206,336 GWh, and energy imports accounted for 29% of the state-wide power mix.³² The CEC estimates that state-wide energy demand will increase to 354,209 GWh in 2030.³³ The proposed project's anticipated electricity usage of 61,901 MWh in 2037 is approximately 0.02% of the projected state-wide demand in 2030. Given that the annual growth rate for the state is 1.27%, the anticipated state-wide energy demand for 2037 will likely be greater than that in 2030, and thus the project's relative percentage contribution to the state-wide energy demand would be even less.

The proposed project's electricity use projections also represent a small percentage of regional estimates for SDG&E. The CEC estimates that SDG&E energy demand will increase to 26,402 GWh in 2030.³⁴ The project's anticipated electricity usage of 61,901 MWh in 2037 is approximately 0.23% of the projected SDG&E planning area demand in 2030.

³² California Energy Commission. 2017. Total Electricity System Power. Available online at: http://www.energy.ca.gov/almanac/electricity_data/total_system_power.html. Accessed: May 2019.

³³ California Energy Commission. 2018. California Energy Demand 2018-2030 Revised Forecast. Available online at: <https://efiling.energy.ca.gov/getdocument.aspx?tn=223244>. Accessed: July 2019.

³⁴ California Energy Commission. 2018. California Energy Demand Revised Baseline SDG&E High Demand Case. Available online at: <https://efiling.energy.ca.gov/GetDocument.aspx?tn=222306&DocumentContentId=28700>. Accessed: July 2019.

Overall, the proposed project's projected electricity demand is consistent with, and a small percentage of, state and regional projections. Therefore, the proposed project will not require additional generation capacity beyond more general state-wide expansion.

Natural Gas

The proposed project's natural gas demand during operation is discussed in **Section 4.2.2**. For comparison, based on 2017 consumption, operation of the proposed project would equate to less than 0.3% of the total natural gas demand citywide and less than 0.01% of the total natural gas demand statewide (**Table 6-4**).

It is projected that California natural gas demand will decrease in 2030 to 2,160,800 MMscf/yr, or 2,230 trillion Btu/yr.³⁵ The proposed project's natural gas consumption accounts for less than 0.01% of the projected statewide annual consumption.

Although natural gas is the most common electricity source in California, 90% of the state's natural gas is imported from the Rocky Mountain region, the Southwest, and Canadian basins.³⁶ The United States produces 20 trillion scf/yr and had 340 trillion scf of proven reserves in 2014.³⁷ The proposed project's natural gas consumption is not substantial in comparison to the national natural gas reserves and comprises less than 0.001% of annual national natural gas production.

Fuel Usage

The proposed project's mobile fuel usage during operation is discussed in **Section 4.3**. For comparison, based on 2017 consumption, operation of the proposed project is approximately 1.5% of the total diesel and 0.7% of the total gasoline that would be used citywide each year. Operation of the proposed project is less than 0.04% of the total diesel and less than 0.03% of the total gasoline that would be used statewide each year (**Table 6-4**).

6.1.2.3 Summary

The proposed project will not have a substantial impact on the local or regional energy supplies or require additional capacity to be constructed. The proposed project's impacts are less than significant.

6.1.3 Peak and Base Period Demands

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

The effects of the project on peak and base period demands for electricity and other forms of energy.

6.1.3.1 Construction

The electricity demand associated with construction of the proposed project will be supplied by generator sets, which are comprised of a generator and diesel engine used to produce

³⁵ California Energy Commission. 2015. Draft Staff Report: 2015 Natural Gas Outlook. Available online at: http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-03/TN206501_20151103T100153_Draft_Staff_Report_2015_Natural_Gas_Outlook.pdf. Accessed: July 2019.

³⁶ U.S. Energy Information Administration. 2016. California State Profile and Energy Estimates: Profile Analysis. Available online at: <https://www.eia.gov/state/analysis.cfm?sid=CA>. Accessed July 2019.

³⁷ California Energy Commission. 2015. Draft Staff Report: 2015 Natural Gas Outlook. Available online at: http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR-03/TN206501_20151103T100153_Draft_Staff_Report_2015_Natural_Gas_Outlook.pdf. Accessed July 2019.

power off-grid. Therefore, no impacts to energy demand are expected as a result of construction activities.

6.1.3.2 Operation

The proposed project was designed to incorporate energy efficiency measures and allow the project to meet both peak and base demand. Specific aspects of the proposed project's energy system design, including solar PV, allow for renewable or sustainable options for meeting peak demands, as discussed in more detail in **Sections 4.2 and 5.1**.

The inclusion of solar PV as a source of renewable energy reduces the strain on electricity production by approximately 14.9%, reducing the demand for electricity generation from the grid resources, particularly during peak times when energy demand is the highest and solar energy potential is also the highest.

In 2016, California's peak grid demand was 46,193 MW. SDG&E's peak grid demand was 4,294 MW in 2016 and is expected to increase to 5,429 MW in 2026.³⁸ The proposed project will have a relatively negligible effect on state-wide and SDG&E peak demands.

6.1.3.3 Summary

As described above, the proposed project will not have a substantial impact on peak and base period demands for electricity and other forms of energy. The proposed project's impacts are less than significant.

6.1.4 Existing Energy Standards

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

The degree to which the project complies with existing energy standards.

6.1.4.1 Construction

Project construction requires use of on-road trucks for soil hauling and deliveries, and off-road equipment such as excavators, cranes, forklifts, and pavers. The construction activities would comply with state requirements designed to minimize idling and associated emissions, which also minimizes use of fuel. Specifically, idling of commercial vehicles and off-road equipment would be limited to five minutes in accordance with the Commercial Motor Vehicle Idling Regulation and the Off-Road Regulation, and the trucks used would be compliant with the requirements of the Tractor-Trailer Greenhouse Gas Regulation.

6.1.4.2 Operation

Electricity and Natural Gas

The proposed project's anticipated electricity and natural gas use in buildings is discussed in the sections above. Specifically, **Table 6-1** shows the proposed project's electricity consumption and **Table 4-4** shows the proposed project's natural gas consumption.

The new building construction is subject to California's Title 24, as discussed in **Section 2.2.2.3** above. California's Title 24 reduces energy use in residential and commercial buildings through progressive updates to both the Green Building Standards Code (Title 24, Part 11) and the Energy Efficiency Standards (Title 24, Part 6).

³⁸ California ISO. 2017. 2016-2017 Transmission Plan. Available online at: http://www.caiso.com/Documents/Board-Approved_2016-2017TransmissionPlan.pdf. Accessed: July 2019.

Fuel Usage

Vehicle use for the proposed project has been evaluated pursuant to the technical advisory that the Governor's Office of Planning and Research has published under SB 743, which created a process to change the methods used for transportation impacts analyses under CEQA from focusing on level of service to VMT.³⁹ (See Cal. Code Regs., tit. 14, § 15064.3.) VMT has a direct correlation to fuel usage.

As described further in the SB 743 VMT Analysis⁴⁰, the VMT generation for the proposed project lowers the regionwide VMT without the proposed project. The SB 743 VMT analysis can be referenced in Section 13 of the TIA. The primary reasons for this reduction are the TDM Program, the proximity of the public transit station, and the mixed-use nature of the proposed project. Reduced VMT results in reduced mobile fuel use per worker and per resident as compared to the regionwide average without the proposed project.

6.1.4.3 Summary

As described above, the proposed project will comply with all applicable energy standards. The proposed project's impacts are less than significant.

6.1.5 Energy Resources

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

The effects of the project on energy resources.

The proposed project's energy use is discussed in Section 3 above, including electricity, natural gas, and gasoline and diesel consumption associated with mobile operations, emergency generator operations, and construction operations. The proposed project's use of energy will not have a substantial effect on statewide or regional energy resources. Total energy use requirements for the baseline and project conditions are summarized in **Tables 6-3 and 6-4**. Programs and measures relevant to energy resources are discussed in detail above.

Additionally, the proposed project is committing to offset a percentage of its energy demand with solar PV systems which will reduce project impact on statewide or regional energy resources.

The proposed project will not significantly impact energy resources and the proposed project's impacts are less than significant.

6.1.6 Transportation Energy Use

This section addresses the following category of environmental impact described in Appendix F of the CEQA Guidelines:

The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

The proposed project's transportation energy use is discussed in **Sections 4.1 and 4.3** above, and gasoline and diesel quantities for the baseline and project conditions are presented in **Table 6-2, and Tables 4-5 and 4-6**. The quantification of VMT associated

³⁹ Governor's Office of Planning and Research. Transportation Impacts (SB 743). Available at: <http://opr.ca.gov/ceqa/updates/sb-743/>. Accessed: July 2019.

⁴⁰ 2019. Fehr & Peers. SDSU Mission Valley Campus Project Transportation Impact Analysis.

with operations, which feeds into total transportation energy use quantified, is discussed in detail in the SB 743 VMT Analysis.

As described further in the SB 743 VMT Analysis, the VMT generation for the proposed project's workers and residents represents a reduction compared to the regionwide average VMT for those populations in the absence of the proposed project. The primary reasons for this reduction are the TDM Program, the proximity of the public transit station, and the mixed-use nature of the proposed project. Reduced VMT results in reduced mobile fuel use per worker and per resident as compared to the regionwide average without the proposed project.

Additionally, the proposed project would develop residential and non-residential land uses in an infill setting that is served by multi-modal transportation options (trolley and bus) and would further enhance other multi-modal options by designing the site to encourage pedestrian- and bicycle-oriented connectivity. The infill location allows the City of San Diego specifically to accommodate existing and projected population and employment growth within a developed, urbanized area. Urban areas served by multi-modal transit options can result in a reduced dependence on automobiles, therefore reducing associated VMT and transportation energy usage.

The proposed project uses efficient transportation alternatives to reduce its transportation energy use requirements, as described further below.

Transportation Demand Management Programs

The SDSU Mission Valley TDM Program will work to reduce the project's impacts on the surrounding roadway network through strategies that focus on: land use diversity, neighborhood site enhancement, commute/travel services, and parking policies and pricing. This additional mitigation will serve to reduce the significant unavoidable impacts to selected freeway, ramp, intersection and roadway segments and will minimize congestion during the peak travel periods. These programs, as they pertain to non-stadium land uses, are expected to reduce VMT by 14.41%.

Existing Transit Services: Existing transit service near the project site includes light rail/trolley and bus services provided by the Metropolitan Transit System (MTS). MTS provides bus and trolley service within the Mission Valley community, including an existing trolley stop at the south edge of the proposed project site.

The trolley's Green Line provides service along the San Diego River corridor, and MTS bus routes 14 and 18 provide service along Qualcomm Way, Fairmount Avenue, Mission Gorge Road, Alvarado Canyon Road, Camino del Rio N, Ward Road, Rancho Mission Road, and Friars Road. A detailed description of existing transit services can be referenced in Section 3.1.2 of the TIA.

Parking Program: The proposed project will include several parking management strategies to discourage the use of single occupancy vehicles and encourage the use of alternative transit options. The proposed strategies include: unbundled parking, meter on-street parking, and limiting parking supply. These strategies are expected to reduce VMT by 4.07%.

Transit Services: The proposed project will encourage the use of alternative transit options by introducing services such as electric bike-share accommodations, support for rideshare options (including coordination with the SANDAG iCommute program), hotel shuttle services,

and school pool programs. Additionally, the proposed project will support TDM strategies by designating a Campus Transportation Coordinator to oversee the development, marketing, implementation, and evaluation of the TDM program. These strategies are expected to reduce VMT by 6.09%.

Electric Vehicles: The proposed project will decrease its fuel use by providing more options for electric vehicle charging (i.e., EV infrastructure and EV chargers). The proposed project parking structures include a total of 503 spaces with charging infrastructure, of which 252 spaces are equipped with charging stations.

Conventional gasoline and diesel vehicles consume gasoline or diesel fuel, whereas EVs consume electricity that can be sourced by fossil fuels or renewables. EVs, including battery-electric vehicles and plug-in hybrid electric vehicles, comprise a growing fraction of the passenger vehicles on the roads in California. EV adoption is expected to increase over the upcoming decades due in part to improvements in battery technology and public initiatives and goals. The proposed project's EV charging stations and infrastructure will reduce fuel use and GHG emissions by assisting Californians in the shift from fossil-fueled vehicles to electric vehicles, while the fossil fuels needed to produce electricity for charging continues to decrease. By 2030, for every mile that is driven in an EV rather than in a gasoline or diesel car, GHG emissions are reduced by over 80% and corresponding fuel use decreases. This is based on the emissions from diesel or gasoline cars using EMFAC2014 in 2030, compared with electricity needed to charge the EV based on an electricity grid that achieves 50% RPS in 2030.

6.1.7 Summary

Based on the above analysis of each of the environmental impact factors identified in CEQA Guidelines Appendix F, the potential for the proposed project to result in wasteful, inefficient, or unnecessary consumption of fuel or energy, and conversely to fail to incorporate renewable energy or energy efficiency measures into building design, equipment use, transportation or other project features is **less than significant**.

6.2 Threshold 2

Would the Project Conflict with or Obstruct a State or Local Plan for Renewable Energy or Energy Efficiency?

The proposed project would comply with any applicable state plans for renewable energy or energy efficiency to the extent required by law. Further, the proposed project is consistent with the renewable energy and energy efficiency provisions of the City of San Diego's CAP and draft MVCP. These plans are described in more detail in **Section 2.2.3** and the relevant provisions of each plan are listed in **Appendix A**. The proposed project has been evaluated for consistency with the relevant provisions and has been concluded to be consistent; the assessment for individual local plan measures is found in **Appendix A**. Additionally the proposed project has been evaluated for consistency with state plans and has been concluded to be consistent; the assessment for state plan measures is found in **Appendix B**. As such, project impacts are less than significant.

TABLES

Table 1-1. Campus Land Use Summary Table
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Project Land Use	CalEEMod [®] Land Use Type	CalEEMod [®] Land Use Subtype ¹	Land Use Unit Amount	Size Metric
Market-based Housing	Residential	Condo/Townhouse High Rise	70	DU
	Residential	Mid-Rise Apartments	2,010	DU
	Residential	High-Rise Apartments	2,220	DU
Student-focused Housing	Residential	Mid-Rise Apartments	300	DU
Campus/Tech Office Space	Commercial	General Office Building	1,165	TSF
Medical Office Space	Commercial	Medical Office Building	100	TSF
Scientific Research	Commercial	Research & Development	301	TSF
Sports Stadium	Recreational	User Defined Recreational	14.82	acre
Hotel	Recreational	Hotel	400	rooms
Retail	Retail	Regional Shopping Center	83	TSF
	Retail	Supermarket	12	TSF
Recreational Center	Recreational	Health Club	25	TSF
Structured Parking	Parking	Enclosed Parking Structure with Elevator	11,270	spaces
Community Park/River Park	Recreational	City Park	6	acre
Active Parks	Recreational	City Park	50	acre
Additional ²	Recreational	City Park	27.6	acre

Notes:

¹ Land uses as defined in CalEEMod[®].

² Additional recreational area includes landscaped areas, paseos, and trails.

Abbreviations:

CalEEMod[®] - California Emissions Estimator Model

DU - dwelling unit

SDSU - San Diego State University

sqft - square feet

TSF - thousand square feet

Table 4-1. Construction Off-Road Equipment Fuel Consumption
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Year	Diesel Consumption ^{1,2} (gallons/yr)
2020	198,562
2021	270,031
2022	687,069
2023	84,710
2024	87,958
2025	111,681
2026	90,982
2027	73,801
2028	81,675
2029	129,265
2030	135,380
2031	114,100
2032	62,819
2033	59,522
2034	53,151
2035	47,639
2036	23,884
2037	6,371
Total	2,318,597

Conversions:

10.35 kg CO₂/gallon diesel
 1,000 kg CO₂/MT CO₂

Notes:

¹ Diesel consumption is based on the CO₂e emissions from CalEEMod.

² The conversion factor for diesel is 10.35 kg CO₂/gallon (The Climate Registry 2018).

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODeI

CO₂ - carbon dioxide

CO₂e - carbon dioxide equivalents

kg - kilograms

MT - metric ton

SDSU - San Diego State University

yr - year

References:

The Climate Registry (May 2018), 2018 Default Emission Factor Document. Available at:
<https://www.theclimateregistry.org/wp-content/uploads/2018/06/The-Climate-Registry-2018-Default-Emission-Factor-Document.pdf>. Accessed: February 2019.

Table 4-2. Construction On-Road Fuel Consumption
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Year	Gasoline Consumption ^{1,2} (gallons/yr)	Diesel Consumption ^{1,2} (gallons/yr)
2020	20,008	207,854
2021	32,544	188,888
2022	18,550	99,166
2023	9,869	3,596
2024	12,611	10,556
2025	16,952	18,263
2026	15,609	18,158
2027	11,552	13,495
2028	6,500	4,942
2029	10,586	9,878
2030	8,936	9,843
2031	7,006	7,369
2032	6,051	4,952
2033	9,198	9,736
2034	8,252	9,722
2035	6,389	7,321
2036	1,238	0
2037	795	0
Total	202,643	623,739

Conversions:

9.13 kg CO₂/gallon gasoline
 10.35 kg CO₂/gallon diesel
 1,000 kg CO₂/MT CO₂

Notes:

¹ Diesel and gasoline consumption are based on the CO₂e emissions from CalEEMod.

² The conversion factors for gasoline and diesel are 9.13 kg CO₂/gallon and 10.35 kg CO₂/gallon, respectively (The Climate Registry 2018).

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODEL
 CO₂ - carbon dioxide
 CO₂e - carbon dioxide equivalents
 kg - kilograms
 MT - metric ton
 SDSU - San Diego State University
 yr - year

The Climate Registry (May 2018), 2018 Default Emission Factor Document. Available at:
<https://www.theclimateregistry.org/wp-content/uploads/2018/06/The-Climate-Registry-2018-Default-Emission-Factor-Document.pdf>. Accessed: February 2019.

Table 4-3. Electricity Consumption
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Inventory Year	Electricity Demand (kWh/yr) ¹	Service Population (SP) ^{2,3}	Electricity per SP (kWh/SP-yr)
Baseline	4,660,920	400	11,652
Project - Stadium Only	5,341,540	570	9,371
Project	72,720,415	14,946	4,866

Notes:

¹ Baseline electricity demand is based on a review of meter readings. Project electricity demand is obtained from CalEEMod[®] outputs and represents regulatory requirements only. Additional details are found in Appendix B.

² Service population for the Baseline is based on data from the SANDAG 2035 regional travel demand model.

³ Service population for the Project is obtained from the Population and Housing Technical Report for San Diego State University Mission Valley Campus Master Plan Project. May 2019.

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODel

kWh - kilowatt hours

SANDAG - San Diego Association of Governments

SP - service population

yr - year

Table 4-4. Natural Gas Consumption
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Inventory Year	Natural Gas Use (kBtu/yr) ¹	Service Population (SP) ^{2,3}	Natural Gas Use per SP (kBtu/SP-yr)
Baseline	1,822,990	400	4,557
Project - Stadium Only	4,143,830	570	7,270
Project	102,012,852	14,946	6,825

Notes:

¹ Baseline natural gas use is based on a review of meter readings. Project natural gas use is obtained from CalEEMod[®] outputs and represents regulatory requirements only. Additional details are found in Appendix B.

² Service population for the Baseline is based on data from the SANDAG 2035 regional travel demand model.

³ Service population for the Project is obtained from the Population and Housing Technical Report for San Diego State University Mission Valley Campus Master Plan Project. May 2019.

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODeI

kBtu - kilo-British thermal unit

SANDAG - San Diego Association of Governments

SP - service population

yr - year

Table 4-5. Gasoline Consumption
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Inventory Year	VMT (miles/yr) ¹	Gasoline Consumption (gallons/yr) ²	Service Population (SP) ^{3,4}	Consumption per SP (gallons/SP-yr)
Baseline	4,325,858	198,367	400	496
Project	175,724,827	5,263,459	14,946	352

Constants:

Average efficiency in 2018 21.81 miles per gallon⁵

Average efficiency in 2035 33.39 miles per gallon⁵

Notes:

¹ Vehicle miles travelled using gasoline for the Baseline and Project are obtained from CalEEMod[®] outputs.

² Gasoline consumption is calculated by assuming an average fuel efficiency and the reported VMT, assuming regulatory requirements only.

³ Service population for the Baseline is based on data from the SANDAG 2035 regional travel demand model.

⁴ Service population for the Project is obtained from the Population and Housing Technical Report for San Diego State University Mission Valley Campus Master Plan Project. May 2019.

⁵ The average fuel efficiency is obtained from EMFAC2014 for San Diego County based on the fuel consumption and vehicle miles travelled for 2018 and 2035.

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODeI

EMFAC2014 - EMission FACtors model

SANDAG - San Diego Association of Governments

SP - service population

yr - year

Table 4-6. Diesel Consumption
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Inventory Year	Diesel Consumption ^{1,2} (gallons/yr)	Service population (SP) ^{2,3}	Diesel Consumption per SP (gallons/SP-yr)
Baseline	23,476	400	59
Project	1,014,587	14,946	68

Constants:

Average efficiency in 2018	8.35 miles per gallon ⁵
Average efficiency in 2035	9.17 miles per gallon ⁵
Diesel density	7.10 pounds/gallon ⁶
Brake-specific fuel consumption	7,000 BTU/horsepower-hour ⁶
Diesel heating value	19,300 BTU/pound ⁶
Fuel consumption rate for Baseline generator	2.04 gallons/hour ⁶
Fuel consumption rate for Project generator	102.76 gallons/hour ⁶

Notes:

¹ Diesel consumption is assumed to result from the emergency generator and medium-heavy to heavy duty vehicle use. Additional details are found in the Air Quality and Greenhouse Gas Emissions Technical Reports.

² Fuel use based on total VMT using data from the TIA and CalEEMod[®] output.

³ Service population for the Baseline is based on data from the SANDAG 2035 regional travel demand model.

⁴ Service population for the Project is obtained from the Service population for the Project is obtained from the Population and Housing Technical Report for San Diego State University Mission Valley Campus Master Plan Project. May 2019.

⁵ The average fuel efficiency is obtained from EMFAC2014 for San Diego County based on the fuel consumption and vehicle miles travelled for 2018 and 2035.

⁶ The fuel consumption rates are calculated from the AP-42 Section 3.4 - Large Stationary Diesel And All Stationary Dual-fuel Engines values for diesel density, brake-specific fuel consumption, and diesel heating value.

Abbreviations:

BTU - British thermal unit

CalEEMod[®] - CALifornia Emissions Estimator MODEl

EMFAC2014 - Emission FACTors model

SANDAG - San Diego Association of Governments

SP - service population

TIA - transportation impact analysis

VMT - vehicle miles traveled

yr - year

Table 5-1. Energy Generation from Solar PV
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Project Design Feature	System Generation (kWh/yr) ^{1,2}	Project Demand (kWh/yr) ³	Percent Offset (%)
Solar PV	10,819,478	72,720,415	14.9%

Notes:

¹ The System Generation is based on Project-specific system size and default commercial solar array assumptions in the National Renewable Energy Laboratory's PVWatts tool. Available at: <http://pvwatts.nrel.gov/pvwatts.php>.

² Additional details are found in the Greenhouse Gas Emissions Technical Report.

³ Electricity demand is obtained from CalEEMod[®] outputs and represents regulatory requirements only. Additional details are found in Appendix B.

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODel

kWh - kilowatt hours

PV - photovoltaic

yr - year

Table 5-2. Reductions from Mobile Project Design Features
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Project Design Features	VMT Reduction (miles/yr) ¹	Gasoline Reduction (gallons/yr) ²	Project Consumption (gallons/yr) ³	Percent Offset (%)
EV chargers	11,497,500	344,383	5,263,459	21.7%
TDM	26,655,018	798,394		
Total	38,152,518	1,142,777		

Constants:

Average efficiency 33.39 miles per gallon⁴

Notes:

- ¹ Annual VMT reduction is based on Project-specific data. Additional details are found in the Greenhouse Gas Emissions Technical Report.
- ² Gasoline reduction is calculated by assuming an average fuel efficiency and the VMT reduction.
- ³ Gasoline consumption is calculated by assuming an average fuel efficiency and the reported VMT, assuming regulatory requirements only.
- ⁴ The average fuel efficiency is obtained from EMFAC2014 for San Diego County based on the fuel consumption and vehicle miles travelled for 2035.

Abbreviations:

- EMFAC2014 - Emission FACTors model
- EV - electric vehicle
- SDSU - San Diego State University
- TDM - transportation demand management
- VMT - vehicle miles traveled
- yr - year

Table 6-1. Electricity Consumption with Project Design Features
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Inventory Year	Electricity Demand (kWh/yr) ¹	Service Population (SP) ^{2,3}	Electricity per SP (kWh/SP-yr)
Baseline	4,660,920	400	11,652
Project ³	72,720,415	14,946	4,866
Project with Project Design Features ⁴	61,900,937	14,946	4,142

Notes:

¹ Electricity demand of the Project is obtained from CalEEMod[®] outputs and represents regulatory requirements only. Additional details are found in Appendix B.

² Service population for the Baseline is based on data from the SANDAG 2035 regional travel demand model.

³ Service population for the Project is obtained from the Population and Housing Technical Report for San Diego State University Mission Valley Campus Master Plan Project. May 2019.

⁴ Electricity demand with Project Design Features is based on the energy demand with regulatory requirements as obtained from CalEEMod[®], as well as reductions for on-site generation.

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODeI

kWh - kilowatt hours

SANDAG - San Diego Association of Governments

SP - service population

yr - year

Table 6-2. Gasoline Consumption with Project Design Features
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Inventory Year	VMT (miles/yr) ¹	Gasoline Consumption (gallons/yr) ²	Service Population (SP) ^{3,4}	Consumption per SP (gallons/SP-yr)
Baseline	4,325,858	198,367	400	496
Project	175,724,827	5,263,459	14,946	352
Project with Project Design Features ⁶	137,572,308	4,120,682	14,946	276

Constants:

Average efficiency in 2018 21.81 miles per gallon⁵
 Average efficiency in 2035 33.39 miles per gallon⁵

Notes:

- ¹ Vehicle miles travelled using gasoline for the Baseline and Project are obtained from CalEEMod[®] outputs.
- ² Gasoline consumption is calculated by assuming an average fuel efficiency and the reported VMT, assuming regulatory requirements only.
- ³ Service population for the Baseline is based on data from the SANDAG 2035 regional travel demand model.
- ⁴ Service population for the Project is obtained from the Service population for the Project is obtained from the Population and Housing Technical Report for San Diego State University Mission Valley Campus Master Plan Project. May 2019.
- ⁵ The average fuel efficiency is obtained from EMFAC2014 for San Diego County based on the fuel consumption and vehicle miles travelled for 2018 and 2035.
- ⁶ Gasoline consumption for Project Design Features assumes a portion of gasoline VMT are offset through Project Design Features such as the TDM Program and EVs due to the EV-ready and EV chargers incorporated into the Project. Details are found in the Greenhouse Gas Emissions Technical Report.

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODeI
 EMFAC2014 - EMission FACtors model
 EV - electric vehicle
 SANDAG - San Diego Association of Governments
 SP - service population
 TDM - transportation demand management
 VMT - vehicle miles traveled
 yr - year

Table 6-3. Construction Energy Resource Summary
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Energy Resource	Construction ¹	City of San Diego		California	
		Consumption	Project's Contribution (%)	Consumption	Project's Contribution (%)
Gasoline (gallons) ^{2,3}	202,643	10,422,773,921	0.002%	279,312,898,878	0.000%
Diesel (gallons) ^{4,5}	2,942,336	414,528,739	0.710%	55,330,515,126	0.005%

Constants:

18 year duration

Notes:

¹ Project data are based on CalEEMod output. The gallons are summed over the entire construction period.

² Gasoline data for the City is calculated based on the on-road transportation CO₂e emissions obtained from Table 17 of the City of San Diego 2018 Climate Action Plan Annual Report Appendix for gasoline vehicles. Available at:

https://www.sandiego.gov/sites/default/files/city_of_san_diego_appendix_for_2018_cap_annual_report_0.pdf. Accessed: May 2019.

³ Gasoline data for the State is obtained for 2018 from <https://www.cdtfa.ca.gov/taxes-and-fees/MVF-10-Year-Report.xlsx>.

⁴ Diesel data for the City is calculated based on the on-road transportation CO₂e emissions obtained from Table 17 of the City of San Diego 2018 Climate Action Plan Annual Report Appendix for diesel vehicles. Available at:

https://www.sandiego.gov/sites/default/files/city_of_san_diego_appendix_for_2018_cap_annual_report_0.pdf. Accessed: May 2019.

⁵ Diesel data for the State is obtained for 2018 from <https://www.cdtfa.ca.gov/taxes-and-fees/Diesel-10-Year-Report.xlsx>.

Abbreviations:

CalEEMod[®] - CALifornia Emissions Estimator MODEL

CAP - Climate Action Plan

CO₂e - carbon dioxide equivalents

Table 6-4. Operation Energy Resource Summary
 SDSU Mission Valley Campus Master Plan Project
 San Diego, California

Energy Resource	Operation ¹	City of San Diego		California	
		Consumption	Project's Contribution (%)	Consumption	Project's Contribution (%)
Electricity (kWh/yr) ^{2,3}	61,900,937	7,738,649,000	0.800%	288,613,480,216	0.021%
Natural Gas (kBtu/yr) ^{4,5}	102,012,852	38,390,822,400	0.266%	1,256,804,127,406	0.008%
Gasoline (gallons/yr) ^{6,7}	4,120,682	570,941,352	0.722%	15,540,154,774	0.027%
Diesel (gallons/yr) ^{8,9}	1,014,587	67,262,101	1.508%	3,089,833,627	0.033%

Conversions:

99,976.1 Btu/therm
 1,000 Btu/kBtu
 1,000,000 kWh/GWh
 1,000 kWh/MWh

Notes:

¹ Project data are based on CalEEMod[®] output.

² Electricity data for the City of San Diego is obtained for 2017 from Table 4 of the City of San Diego 2018 Climate Action Plan Annual Report Appendix. Available at: https://www.sandiego.gov/sites/default/files/city_of_san_diego_appendix_for_2018_cap_annual_report.pdf. Accessed: May 2019.

³ Electricity data for the State is obtained for all counties in 2017 from <http://www.ecdms.energy.ca.gov/elecbycounty.aspx>.

⁴ Natural gas data for the City of San Diego is obtained for 2017 from Table 6 of the City of San Diego 2018 Climate Action Plan Annual Report Appendix. Available at: https://www.sandiego.gov/sites/default/files/city_of_san_diego_appendix_for_2018_cap_annual_report.pdf. Accessed: May 2019.

⁵ Natural gas data for the State is obtained for all counties in 2017 from <http://www.ecdms.energy.ca.gov/gasbycounty.aspx>.

⁶ Gasoline data for the City of San Diego is calculated based on the portion of total vehicle miles travelled obtained from Table 17 of the City of San Diego Climate Action Plan Annual Report Appendix which is travelled by gasoline vehicles. Available at: https://www.sandiego.gov/sites/default/files/city_of_san_diego_appendix_for_2018_cap_annual_report.pdf. Accessed: May 2019.

⁷ Gasoline data for the State is obtained for 2017 from http://www.cdtfa.ca.gov/taxes-and-fees/MVF_10_Year_Report.pdf.

⁸ Gasoline data for the City of San Diego is calculated based on the portion of total vehicle miles travelled obtained from Table 17 of the City of San Diego Climate Action Plan Annual Report Appendix which is travelled by diesel vehicles. Available at: https://www.sandiego.gov/sites/default/files/city_of_san_diego_appendix_for_2018_cap_annual_report.pdf Accessed: May 2019.

⁹ Diesel data for the State is obtained for 2017 from http://www.cdtfa.ca.gov/taxes-and-fees/Diesel_10_Year_Report.pdf.

Abbreviations:

Btu - British thermal unit
 CalEEMod[®] - CALifornia Emissions Estimator MODel
 GWh - gigawatt hours
 kWh - kilowatt hours
 kBtu - kilo-British thermal unit
 MWh - megawatt hours
 yr - year

APPENDIX A
LOCAL PLAN-LEVEL CONSISTENCY ANALYSIS

Appendix A-1 – Consistency with the City of San Diego’s Mission Valley Community Plan

Measure/Strategy	Description	Consistency Analysis
City of San Diego’s Mission Valley Community Plan ¹		
DG-27 Solar Access and Energy Conservation	Employ climate-appropriate design strategies to allow for passive solar access and energy-efficient installations, including: <ul style="list-style-type: none"> - Allowing for adequate access to light and air so that daylight is able to reach all living spaces for part of the day, and adequate ventilation is provided when windows are open. Prioritize south-facing windows and private open space. - Siting building so that plazas and other public spaces will not be kept in shadows at all times and will not experience excessive wind conditions. - Locating parking areas with large paved surfaces to the east and north of adjacent buildings to reduce solar reflection on buildings. - Placing evergreen trees on the west side of buildings to provide protection from prevailing winds. 	<p>Consistent. The proposed project would comply with applicable standards set forth in the California Building Code (Cal. Code Regulations, Title 24, Parts 6 and 11), which contributes to the energy conservation noted in this measure. As to the building and site orientation recommendations contained in this measure, the layout of the project’s development areas has been designed to maximize the unique infill opportunity presented at this Mission Valley location. The project proposes a compatible mix of land uses that would intersect in a campus setting.</p>
DG-28 Energy	Consider clustering buildings to use a common heating/cooling source.	<p>Consistent. The proposed project consists of a mixed-use development, which locates buildings in close proximity. The design of the site will ensure the optimum heating and cooling systems are incorporated. Thus, the nature of the proposed project complies with this measure.</p>

¹ Mission Valley Community Plan. 2019. Final Draft for Community Review. June 2019. Available at: <https://www.sandiego.gov/planning/community/cpu/missionvalley>. Accessed June 2019.

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
DG-34 Roof Surfaces	Consider locating sloped roof surfaces facing the south, and at an angle that can accommodate solar panel or film installation for renewable energy generation or centralized solar hot water heating.	Consistent. The proposed project would install solar photovoltaic (PV) panels throughout the development areas, and roof surfaces with appropriate attributes for solar generation would be selected. For more information on the attributes of the solar design commitment, please see Section 5.1 .
DG-40 Operable windows	Wherever applicable, provide operable windows that allow natural ventilation and potentially eliminate the need for mechanical ventilation. If mechanical systems are necessary, use energy-efficient and low emission heating, ventilation, and air conditioning (HVAC) systems.	Consistent. Project development areas would maximize natural ventilation. Mechanical systems also would be designed and built according to all applicable building code and energy efficiency standards (see, e.g., Cal. Code Regulations, Title 24, Parts 6 and 11).
DG-45 Energy and Building Materials	Use building materials which will act as insulators or conductors, depending on energy needs.	Consistent. Project development areas would meet the applicable requirements of the California Building Code (Cal. Code Regulations, Title 24, Parts 6 and 11), which includes requirements for building materials.
DG-62 Sustainable Materials	Where possible, use sustainable building materials to the maximum extent feasible. Incorporate recycled, renewable, sustainable, and non-toxic/low-VOC (volatile organic compound) materials. Use of locally harvested and/or manufactured materials is desired.	Consistent. The proposed project would comply with applicable standards set forth in the California Building Code (Cal. Code Regulations, Title 24, Parts 6 and 11), which includes requirements for building materials. In addition, the proposed project would comply with applicable San Diego Air Pollution Control District (SDAPCD) rules governing VOC content of coatings. Where applicable, compliance with the Buy Clean California Act (AB 262, 2017) also would be required to aid in the reduction of GHG emissions associated with the manufacture and transport of products used in public works projects.

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
DG-63 Sustainable Landscaping	Provide on-site landscaping improvements that minimize heat gain and provide attractive and context sensitive landscape environments, by: <ul style="list-style-type: none"> - Building roof gardens, eco-roofs, or other vegetated roof systems to help reduce the solar heat gain of building roofs and to serve as shared open space. - Minimizing impervious surfaces that have large thermal gain. 	<p>Consistent. The proposed project integrates extensive parks and landscaping, including the planting of new, on-site trees. (See, e.g., EIR Section 2.0, Project Description.) Further, project design parameters do not preclude the use of vegetated roofing systems; the installation of such systems would be determined on a building-by-building basis, following consideration of site orientation, building use, available rooftop space (following PV installation), and other factors. In addition, the proposed project would comply with applicable requirements of the CalGreen Building Standards Code (Cal. Code Regulations, Title 24, Part 11), which address the reduction of impervious surfaces. Site development is compact by design, in order to maximize the available infill opportunity. Impervious surfaces would be utilized where needed, and complemented by the proposed extensive park areas along the San Diego River.</p>
DG-64 Water Efficiency and Conservation	Install water saving appliances and systems such as grey water systems, moisture-sensitive irrigation rainwater cisterns, and low-flow toilets and faucets. Any exterior systems should be integrated into building design.	<p>Consistent. The proposed project would comply with applicable requirements of the California Building Code (Cal. Code Regulations, Title 24, Parts 6 and 11), and the City of San Diego’s (City) Climate Action Plan (CAP) Checklist, which include requirements for water management, efficiency and conservation.</p>

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
DG-67 Energy Generation	Integrate energy generation and sustainability such as solar, wind, geothermal or other technologies into the overall building design consistent with the architectural design.	Consistent. The proposed project would install solar PV panels through the development areas. For more information on the attributes of the solar design commitment, please see Section 5.1.
DG-68 Carbon Sequestration	Incorporate new trees into site plans that have the potential for storage and sequestration of high levels of carbon.	Consistent. The proposed project includes planting of new trees (approximately 3.5 times the number of new trees compared to what currently exists at the site).
DG-69 Zero Net Energy Buildings	Strive for zero net energy in a building design.	Consistent. Project development areas would incorporate energy efficiency measures in compliance with the version of the California Building Code (Cal. Code Regulations, Title 24, Parts 6 and 11) applicable at the time of building permit application, and incorporate solar PV panels beyond what is required by existing regulatory standards. It also is noted that the 2019 Title 24, Part 6 standards – which go into effect on January 1, 2020 – include zero net electricity requirements for low-rise residential buildings (3 stories or less).

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
DG-73 Mobility Hubs	Design areas around trolley stations to provide for a range of services that can improve first-last mile connections. This includes drop-off/pick-up areas for ride-hailing and shuttle services, space for scooter- and bikeshare storage, parking spaces dedicated to carsharing services, charging stations, and package pick-up areas.	Consistent. The proposed project site is located near the existing, underutilized Metropolitan Transit System (MTS) Green Line Stadium Station, and would provide an enhanced pedestrian connection to this station. The proposed project also would incorporate connectivity as part of the project design, which includes establishing a sustainable, walkable, and transit-oriented campus with enriched pedestrian spaces, walking paths and trails, as well as electric vehicle charging stations. The project’s Transportation Demand Management (TDM) Program also includes elements such as bicycle racks and secure bicycle parking; showers and lockers for employees; a transportation corridor and an information-sharing website and kiosks; coordination with the SANDAG’s iCommute program; guaranteed rides home; unbundled residential parking; and, metered and time-limited on-street parking.
RES-4 Residential Development	Affordable housing is encouraged to be built on site.	Consistent. As required by Measure G, the proposed project is designed consistent with the City’s affordable housing requirements (i.e., 10% of total residential units).

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
GBP-1 Green Building Practices	The use of sustainable building practices is highly encouraged. New buildings should strive to qualify for LEED accreditation.	Consistent. The proposed project would comply with applicable green building practices set forth in the California Building Code (Cal. Code Regulations, Title 24, Parts 6 and 11). Additionally, individual buildings within the project development area would be designed to achieve LEED equivalent standards (Silver minimum); and, the project – as a whole – would be designed to achieve LEED-Neighborhood Design equivalent standards (Silver minimum).
GBP-3 Green Building Practices	New development should not inhibit the solar access of neighboring buildings to the maximum extent practical.	Consistent. The proposed project is designed to not inhibit solar access of neighboring buildings to the maximum extent practical.
BIC-1 Bicycling	New development required to build 10 long-term bicycle parking spaces should provide a sheltered Bike Kitchen – a place to use tools and repair bicycles.	Consistent. The proposed project would meet, and exceed, the number of bicycle parking spaces per dwelling unit specified in the City of San Diego Municipal Code. The proposed project also would include a place to use tools and repair bicycles.
BIC-3 Bicycling	Access plans for new development should clearly identify ingress and egress for bicycles, with minimum interaction with vehicles.	Consistent. The proposed project incorporates bicycle paths and ingress/egress points with wayfinding to minimize interaction with vehicles.
BIC-4 Bicycling	New development should provide connections to bicycle trails and routes per the San Diego Regional Bicycle Plan. Open spaces should also be located to abut or provide direct access to bicycle facilities.	Consistent. The proposed project incorporates bicycle paths and ingress/egress points. In addition, a hike-and-bike trail would be located throughout the open space portions of the proposed project.

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
PRK-6 Parking	Parking areas should be distributed throughout a project site to avoid large contiguous parking areas and to integrate landscaping. Each parking area should include no more than 30 percent of the project’s parking spaces.	Consistent. The proposed project integrates landscaping into the project site and disperses parking throughout the site. Notably, many of the parking areas consist of multi-level parking garages that are consolidated, allowing additional space for landscaping, paseos, and other open areas.
PRK-8 Parking	A minimum of 10 percent landscaping of the parking lot area is encouraged.	Consistent. The proposed project integrates landscaping into the project site, including in the parking areas.
SMC-2 Smart Cities	For energy efficiency and to minimize light pollution, lighting with adaptive controls should be considered.	Consistent. The proposed project would include adaptive lighting controls, where appropriate and feasible, in order to maximize energy efficiency and minimize light pollution. In addition, the proposed project would comply with applicable energy efficiency standards set forth in the California Building Code (Cal. Code Regulations, Title 24, Parts 6 and 11), which address lighting energy efficiency.
SMC-1 Smart Cities	Consider providing priority parking and charging stations (preferably solar) to promote sustainable practices and accommodate the use of Electric Vehicles (EVs), including smaller short-distance neighborhood electric vehicles.	Consistent. The proposed project would include 503 parking spaces that are EV-ready, of which 252 spaces are equipped with EV charging stations.
PRK-4 Parking	New development should consider designating priority electric vehicle and zero emissions vehicle parking.	Consistent. The proposed project would designate certain parking spaces in prioritized locations for electric vehicles and zero emission vehicles.
PRK-2 Parking	New development should consider unbundled parking to offset development costs and encourage use of alternative transportation modes.	Consistent. The project’s Transportation Demand Management (TDM) Program requires that residential parking be unbundled from unit counts.

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
TDM-1 Transportation Demand Management	New development considering community circulators as a TDM measure should evaluate a coordinated effort with additional properties to expand the service and access more community destinations.	Consistent. This measure is not applicable because the proposed project does not propose a community circulator as a part of its TDM program. The proposed project’s TDM program includes several other measures that enhance mobility throughout the project site.
TDM-2 Transportation Demand Management	New development should consider developing and implementing an approved TDM Plan designed to reduce peak period automobile use and lower the minimum parking requirement. Reference San Diego Municipal Code Chapter 14, Article 2, Division 5.	Consistent. The project as developed a TDM plan which included various measures aimed at reducing peak period single occupancy automobile use and reducing parking needs.
TDM-3 Transportation Demand Management	New development should incorporate mobility hub features such as EV chargers, rideshare pick-up/drop-off space, bicycle parking, and transit information on development.	Consistent. The project will provide EV chargers in the residential, retail, office, and stadium parking areas, as well as, rideshare pick-up/drop-off space to serve these uses. Residential bicycle storage will be provided in residential parking areas and long-term and short-term bicycle parking will be available for public use at various locations in the site. Transit information will be provided by the project’s Transportation Coordinator and will be made available to all project employees and residents.
TDM-4 Transportation Demand Management	New development should designate visible space along the property frontage to allow for staging of shared vehicles, bikes, and scooters.	Consistent. Visible space for the staging of shared vehicles, bikes, and scooters will be provided along the project frontage and along the project shared-use path that connects the project’s land uses and the trolley station, as well as, other locations throughout the site as needed.

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Measure/Strategy		Description	Consistency Analysis
TDM-5	Transportation Demand Management	<p>New development should consider participating in existing TDM programs, including but not limited to those overseen by SANDAG and MTS, in order to:</p> <ul style="list-style-type: none"> • Encourage rideshare and carpool for major employers and employment centers. • Promote car/vanpool matching services. • Continue promotion of SANDAG’s guaranteed ride home for workers who carpool throughout Mission Valley. • Provide flexible schedules and telecommuting opportunities for employees. 	<p>Consistent. The project’s Transportation Coordinator will encourage residents and employees to participate in rideshare and carpool services and promote SANDAG’s guaranteed ride home program. Additionally, the Transportation Coordinator will encourage employers to provide flexible schedules and telecommuting opportunities.</p>
TDM-6	Transportation Demand Management	<p>New development should provide flexible curb space in commercial/retail and residential areas to meet the needs of shared mobility services and the changing demands of users.</p>	<p>Consistent. Flexible curb space will be provided in the commercial/retail and residential areas of the project in order to accommodate TNC loading and unloading operations, deliveries, and other loading activities.</p>
TDM-7	Transportation Demand Management	<p>New development should post information related to available transit service and bicycle infrastructure as a means to encourage use of alternative transportation modes.</p>	<p>Consistent. As discussed in relation to measure TDM-3, the project’s Transportation Coordinator will provide information related to available transit service and bicycle infrastructure to all residents and employees.</p>
TDM-8	Transportation Demand Management	<p>Employers should consider providing “parking cash out” options to employees—option for employees to receive the cash value of employer-paid parking subsidies in lieu of a parking spot—as an alternative to providing free or subsidized parking or transit passes.</p>	<p>Consistent. Employers that rent office space on the project site will be educated about this program by the Transportation Corridor and can decide to participate in either of the programs if they choose to do so.</p>

Appendix A-2 – Consistency with the City of San Diego’s CAP Checklist

Measure/Strategy	Description	Consistency Analysis
City of San Diego’s CAP Checklist		
Strategy 1 Energy and Water Efficient Buildings [Roofing]	<ul style="list-style-type: none"> - Would the project include roofing materials with a minimum 3-year aged solar reflection and thermal emittance or solar reflection index equal to or greater than the values specified in the voluntary measures under California Green Building Standards Code (Attachment A)?; OR - Would the project roof construction have a thermal mass over the roof membrane, including areas of vegetated (green) roofs, weighing at least 25 pounds per square foot as specified in the voluntary measures under California Green Building Standards Code?; OR - Would the project include a combination of the above two options? 	<p>Consistent. Project development areas would comply with one, both or a combination of the roofing options provided in this strategy, as a condition of building permit issuance.</p>
Strategy 1 Energy and Water Efficient Buildings [Residential: Plumbing fixtures and fittings]	Residential buildings: <ul style="list-style-type: none"> - Kitchen faucets: maximum flow rate not to exceed 1.5 gallons per minute at 60 psi; - Standard dishwashers: 4.25 gallons per cycle; - Compact dishwashers: 3.5 gallons per cycle; and - Clothes washers: water factor of 6 gallons per cubic feet of drum capacity? 	<p>Consistent. The project’s residential development areas would comply with the maximum flow rates for plumbing fixtures and appliances provided in this strategy, as a condition of building permit issuance.</p>

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
Strategy 1 Energy and Water Efficient Buildings [Non-residential: Plumbing fixtures and fittings]	Non-residential buildings: <ul style="list-style-type: none"> - Plumbing fixtures and fittings that do not exceed the maximum flow rate specified in Table A5.303.2.3.1 (voluntary measures) of the California Green Building Standards Code (See Attachment A); and - Appliances and fixtures for commercial applications that meet the provisions of Section A5.303.3 (voluntary measures) of the California Green Building Standards Code (See Attachment A)? 	Consistent. The project’s nonresidential development areas would comply with the maximum flow rates for plumbing fixtures and appliances provided in this strategy, as a condition of building permit issuance.
Strategy 3 Bicycling, Walking, Transit, & Land Use [EV Chargers]	Multiple-family projects of 17 dwelling units or less: Would 3% of the total parking spaces required, or a minimum of one space, whichever is greater, be provided with a listed cabinet, box or enclosure connected to a conduit linking the parking spaces with the electrical service, in a manner approved by the building and safety official, to allow for the future installation of electric vehicle supply equipment to provide electric vehicle charging stations at such time as it is needed for use by residents?	Not Applicable. This strategy is not applicable because the proposed project includes more than 17 dwelling units.
Strategy 3 Bicycling, Walking, Transit, & Land Use [EV Chargers]	Multiple-family projects of more than 17 dwelling units: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use by residents?	Consistent. The proposed project would provide a minimum of 85 EV-ready spaces with charging stations in the residential development areas.
Strategy 3 Bicycling, Walking, Transit, & Land Use [EV Chargers]	Non-residential projects: Of the total required listed cabinets, boxes or enclosures, would 50% have the necessary electric vehicle supply equipment installed to provide active electric vehicle charging stations ready for use?	Consistent. The proposed project would provide a minimum of 167 EV-ready spaces with charging stations in the non-residential development areas.

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
Strategy 3 Bicycling, Walking, Transit & Land Use [Bicycle Parking]	Bicycle Parking Spaces: Would the project provide more short- and long-term bicycle parking spaces than required in the City’s Municipal Code (Chapter 14, Article 2, Division 5)?	Consistent. The proposed project would meet, and exceed, the number of bicycle parking spaces per dwelling unit specified in the San Diego Municipal Code.
Strategy 3 Bicycling, Walking, Transit & Land Use [Shower facilities]	If the project includes nonresidential development that would accommodate over 10 tenant occupants (employees), would the project include changing/shower facilities in accordance with the voluntary measures under the California Green Building Standards Code as shown in the table?	Consistent. The proposed project’s non-residential development areas would provide changing/shower facilities as required by the referenced CalGreen provision, as a condition of building permit issuance.
Strategy 3 Bicycling, Walking, Transit & Land Use [Parking spaces]	Designated Parking Spaces: If the project includes a nonresidential use in a TPA, would the project provide designated parking for a combination of low-emitting, fuel-efficient, and carpool/vanpool vehicles in accordance with the table?	Consistent. The proposed project’s non-residential development areas would provide designated parking for a combination of the specified vehicles, as a condition of building permit issuance.

Appendix A – Local Plan-Level Consistency Analysis

Measure/Strategy	Description	Consistency Analysis
Strategy 3 Bicycling, Walking, Transit & Land Use [TDM]	Transportation Demand Management Program. If the project would accommodate over 50 tenant-occupants (employees), would it include a transportation demand management program that would be applicable to existing tenants and future tenants that includes the components listed in the CAP Checklist?	<p>Consistent. A Transportation Demand Management Program has been designed for the proposed project. The TDM program includes:</p> <ul style="list-style-type: none"> • Neighborhood Site Enhancement – Includes new bike facilities, dedicated land for bicycle/multi-use trails, bicycle parking, and increased intersection density. Also includes: <ul style="list-style-type: none"> ○ Traffic Calming ○ Car Share ○ Pedestrian Network • Parking Policy/Pricing <ul style="list-style-type: none"> ○ Unbundled Parking ○ Meter On-Street Parking • Commute Trip Reduction <ul style="list-style-type: none"> ○ TDM Marketing with Transportation Coordinator ○ Carpool Matching/Guaranteed Ride Home ○ Bicycle Share ○ School Pool ○ Hotel Shuttle Service

APPENDIX B
STATE PLAN-LEVEL CONSISTENCY ANALYSIS

Appendix B. State Plan-Level Consistency Analysis

SDSU Mission Valley Campus Master Plan Project
San Diego, California

#	Plan	Category Description	Consistency Analysis
1	California Renewables Portfolio Standard (RPS) and SB 100	Increases the proportion of electricity from renewable sources to 33 percent renewable power by 2020 and 40 percent renewable power by 2024. SB 100 requires 50 percent by 2026 and 60 percent by 2030. It also requires the State Energy Resources Conservation and Development Commission to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.	Consistent. The Project would be consistent with and not impair implementation of the state's RPS.
2	California Code of Regulations, Title 24, Part 6	Title 24, Part 6 of the California Code of Regulations establishes energy and water efficiency requirements for residential and non-residential new construction, additions to existing buildings, and alterations to existing buildings. Standards include requirements for water heating, HVAC, lighting, electrical systems, and solar design.	Consistent. The Project would meet the energy efficiency standards of Title 24.
3	Assembly Bill 1109	The Lighting Efficiency And Toxics Reduction Act (AB 1109) requires a reduction in average statewide electrical energy consumption by not less than 50 percent from the 2007 levels for indoor residential lighting and not less than 25 percent from the 2007 levels for indoor commercial and outdoor lighting by 2018.	Consistent. The Project would meet the applicable requirements from AB 1109.
4	California Green (CalGreen) Building Standards Code Requirements	CalGreen establishes green building standards to meet the goals of AB 32. CalGreen includes standards for residential and nonresidential structures such as new buildings or portions of new buildings, additions and alterations, and all occupancies where no other state agency has the authority to adopt green building standards applicable to those occupancies. Standards include requirements for site development, indoor and outdoor water use, construction waste reduction, disposal and recycling and building maintenance and operation.	Consistent. The Project would meet the CalGreen Building Standards Code Requirements.

Abbreviations:

AB - Assembly Bill

CalGreen - California Green Building Standards Code

RPS - Renewable Portfolio Standard

SB - Senate Bill