IV.L.4 Energy (Electricity and Natural Gas)

1.0 INTRODUCTION

This section discusses potential impacts of the Proposed Project on energy resources within the Proposed Project area, specifically upon electricity and natural gas supplies and conveyance systems. This analysis defines the sources and suppliers of electricity and natural gas for the Loyola Marymount University campus, describes existing consumption and the state of existing infrastructure on the campus and in the Proposed Project area, estimates Proposed Project-related energy consumption at buildout, and evaluates the ability of the utility companies to meet that demand.

2.0 REGULATORY FRAMEWORK

2.1 Electricity

2.1.1 State Regulations

2.1.1.1 Title 24, California Code of Regulations

All new construction in the State of California is subject to the Building Energy Efficiency standards set forth in Title 24 of the California Code of Regulations. The current standards adopted in 2005 apply through June 30, 2009, with new standards adopted in April 2008 in effect as of July 1, 2009 for building permit applications submitted after that date. The standards apply to new construction of both residential and non-residential buildings and regulate energy consumption for heating, cooling, ventilation, water heating and lighting. The building efficiency standards are enforced through the local plan check and building permit process. Local government agencies may adopt and enforce additional energy standards for new buildings as reasonably necessary due to local climatologic, geologic, or topographic conditions, provided that these standards exceed those provided in Title 24. The City of Los Angeles has adopted such additional standards (please refer to **Section 2.1.2.2, City of Los Angeles Green Building Program Ordinance)**.

2.1.1.2 Executive Order S-20-04

Governor Arnold Schwarzenegger signed Executive Order S-20-04 regarding Green Buildings on December 14, 2004. It established the State of California's priority for energy and resource-efficient high performance buildings. The Executive Order sets a goal of reducing grid-based energy purchases by 20 percent by 2015 in state-owned buildings, and encourages the private commercial sector to set the same goal. The order also directs compliance with the Green Building Action Plan, which details the

measures the state will take to meet these goals.[1] The Executive Order assigns the California Energy Commission to further develop and refine (Title 24) building energy efficiency standards applicable to commercial building sector to result in 20 percent savings by 2015 using standards adopted in 2003 as the baseline.

2.1.1.3 California Public Utilities Commission

The California Public Utilities Commission regulates investor-owned electric power and natural gas utilities, as well as other utilities, in the State of California. The California Public Utilities Commission is responsible for regulating rates, protecting against fraud, and promoting the health of California's economy, and has advisory, strategic planning, and enforcement units devoted to the state's "energy future."

The California Public Utilities Commission, with support from the Governor's Office, the California Energy Commission, the California Air Resources Board, the state's utilities, local government, and others, has adopted the California Long-Term Energy Efficiency Strategic Plan. The plan was developed in recognition of the relationship between energy efficiency, energy, and climate change, and in response to the need for a "scaling up statewide energy efficiency efforts to meet today's urgent energy challenges."[2] Released in September 2008, the Plan sets forth a statewide "roadmap" intended to maximize achievement of cost-effective energy efficiency in California's electricity and natural gas sectors between 2009 and 2020, and beyond. The plan identifies four primary energy markets, or end users, in California—residential, commercial, industrial and agricultural—and makes recommendations for coordinated action concerning energy efficiency strategies between the state, its utilities, the private sector, and other market players.

2.1.1.4 Assembly Bill 32

Assembly Bill 32 (AB 32, Nuñez and Pavley), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006, represents the first enforceable statewide program to limit greenhouse gas (GHG) emissions from all major industries with penalties for noncompliance. The California Air Resources Board is responsible for carrying out and developing the programs and requirements necessary to achieve the goals of AB 32 - the reduction of California's greenhouse gas emissions to 1990 levels by 2020. For more information on AB 32, please see **Section IV.B.2, Global Climate Change**.

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1 California Energy Commission, "Green Building Initiative," http://www.energy.ca.gov/greenbuilding. 2008.

2 California Public Utilities Commission (CPUC). *California Long-Term Energy Efficiency Strategic Plan -- Executive Summary* (2008) 1.

2.1.1.5 Senate Bill 1368

Senate Bill (SB) 1368 requires the California Public Utilities Commission and California Energy Commission to establish greenhouse gas emission performance standards for the generation of electricity. These standards will also generally apply to power that is generated outside of California and imported into the State. SB 1368 provides a mechanism for reducing the emissions of electricity providers, thereby assisting the California Air Resources Board to meet its mandate under AB 32. On January 25, 2007, the California Public Utilities Commission adopted an interim Greenhouse Gas Emissions Performance Standard, which is a facility-based emissions standard requiring that all new long-term commitments for baseload generation to serve California consumers be with power plants that have greenhouse gas emissions no greater than a combined cycle gas turbine plant. That level is established at 1,100 pounds of CO_2 per megawatt-hour (MWh). Further, on May 23, 2007, the California Energy Commission adopted regulations that establish and implement an identical Emissions Performance Standard of 1,100 pounds of CO_2 per MWh (see California Energy Commission order No. 07-523-7).

2.1.1.6 California Air Resources Board

On October 24, 2008, California Air Resources Board staff released a draft proposal for determining a project's significance with respect to global climate change under CEQA. The California Air Resources Board is responsible for carrying out and developing the programs and requirements necessary to achieve the goals of AB 32, which target the reduction of California's greenhouse gas emissions to 1990 levels by 2020.

If the project meets certain specific, yet-to-be-developed performance standards for several categories of greenhouse gas emissions, including construction, building energy usage, water usage, solid waste generation, and transportation, and emits no more than a certain yet-to-be-determined amount of metric tons of carbon equivalents per year, greenhouse gas impacts would not be significant. According to the California Air Resources Board, the California Energy Commission Tier II building energy use standards contained in the guidelines for Senate Bill 1 (SB 1, Murray) are proposed to be used, which generally require a reduction in energy usage of 15 to 30 percent beyond Title 24 building code requirements. The California Air Resources Board, the Proposed Project's greenhouse gas emissions, and AB 32 are further discussed in **Section IV.B.2, Climate Change**.

2.1.2 Local Regulations

Coal, a fossil fuel and nonrenewable resource, accounts for most of the City's power generation. As concerns develop over global climate change and the depletion of fossil fuels, energy conservation has

become an increasingly important issue facing the City. Energy policies are contained in several local policy documents, summarized below.

2.1.2.1 City of Los Angeles General Plan

The Conservation Element of the City's General Plan sets forth three resource management policies pertaining to the conservation of fossil fuels.[3] Policy No. 1 encourages energy conservation and petroleum product reuse through three programs to be administered by the Los Angeles Department of Water and Power (LADWP): public information and energy conservation incentives programs, petroleum products recycling, and alternative fuel and energy sources research and use. The remaining policies pertain to oil-drilling activities and do not pertain to the Proposed Project.

Long-term goals related to energy are also set forth by the City of Los Angeles in the General Plan Framework Element. The General Plan Framework document sets forth a strategy for long-term growth and provides a citywide context to guide the update of the community plan and citywide elements. The Framework discusses the "urban heat island effect" in urban areas. The "urban heat island effect" is the increase in temperatures in urban areas, largely caused by the concentration of buildings and paved surfaces, which results in a greater number of days when air quality is unhealthy. For this reason, the Element encourages better management of the urban forest, including the use of properly planted trees to create tree canopy cover of buildings and paved surfaces, throughout the City to reduce the demand for air conditioning and cooling in buildings and on paved surfaces.[4]

2.1.2.2 City of Los Angeles Green Building Program Ordinance

In May 2007, the City of Los Angeles issued a Climate Action Plan to reduce greenhouse gas emissions 35 percent below 1990 levels by 2030. The Climate Action Plan specifically references the need to reduce the emissions of CO_2 and other greenhouse gases from buildings within the City. In order to achieve the goals laid out in the Climate Action Plan, the City Council approved the Green Building Program Ordinance, which the Mayor signed into law on April 22, 2008.

The purpose of the Green Building Program is to reduce the use of natural resources, create healthier living environments and minimize the negative effects of development on local, regional, and global ecosystems. The Program aims to reduce the City's dependency on energy generated from fossil fuels and natural gas by implementing policies which increase energy efficiency, and use clean and renewable energy sources.

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3 City of Los Angeles, "Conservation Element," *General Plan* (2001) II-64.

4 City of Los Angeles, "Chapter 9 – Infrastructure and Public Services," *General Plan Framework* (1995).

The Green Building Program comprises three main components. The Standards of Sustainability component requires non-residential and high-rise residential projects with at least 50,000 square feet of floor area and low-rise residential projects with at least 50 units or 50,000 square feet of floor area to meet at a minimum the US Green Building Council's Leadership in Energy and Environmental Design® (LEED®) Certified level. Redevelopment projects that exceed 50 percent of the valuation of the existing building's replacement cost are also subject to this requirement. Projects must also include a LEED® Accredited Professional on the project team and must demonstrate compliance with the intent of the LEED® Certified level.

The Standard of Sustainable Excellence component establishes incentives for projects that register with the US Green Building Council's LEED® program and complies with the Standards of Sustainability component at the LEED® Silver or higher level. The incentives include expedited services within several City departments including the Department of City Planning, Department of Building Safety, Department of Water and Power, and the Bureau of Engineering.

The Green Building Team component acts as a working group that oversees the Standards of Sustainability and Sustainable Excellence. The function of the Green Building Team is to provide a public forum for addressing technical issues associated with the ordinance, to educate City staff, to develop an educational public outreach program, and to provide an annual report to the City Council. The Green Building Team also reviews and suggests modifications to the Los Angeles Municipal Code to facilitate the City's green building objectives. The Green Building Team is composed of members from key City departments and agencies and representatives from other organizations, such as the County of Los Angeles and the Metropolitan Transit Authority, as needed.

The provisions of the Green Building Program do not apply to projects under the circumstances listed below:

- A Historic Resource, if the Department of City Planning finds that full LEED® compliance would require alterations that conflict with the Secretary of the Interior's Standards for the Treatment of Historic Properties. In those cases, a LEED®-AP shall assert in writing that the Project has incorporated all other reasonable measures to achieve LEED® compliance, while avoiding adverse impacts to the Historic Resource's character-defining features.

- Any Project where plans were accepted by the Department of Building and Safety for plan check and the appropriate fee is paid prior to November 1, 2008, provided no changes were made to the Project that would increase the floor area by more than five percent. This exception shall no longer be valid if construction is not commenced within one year of the date of issuance of the permit.

- Any entitlement application for a Project filed and deemed complete with the exception of CEQA review prior to November 1, 2008, provided no changes are made to the application that would increase the floor area by more than five percent.

- Any residential or mixed use Project of six or fewer stories where plans were accepted by the Department of Building and Safety for plan check and the appropriate fee is paid prior to May 1, 2009, provided no changes were made to the Project which increase the floor area by more than five percent. This exception shall no longer be valid if construction is not commenced within one year of the date of issuance of the permit.

- Any entitlement application for a residential or mixed use Project of six or fewer stories filed and deemed complete with the exception of CEQA review prior to May 1, 2009, provided no changes are made to the application that would increase the floor area by more than five percent.

2.1.2.3 LADWP Programs

On the supply side, LADWP is developing a Renewable Portfolio Standard designed to increase the amount of energy it generates from renewable sources to 20 percent of its energy sales to retail customers by 2017, with an interim goal of 13 percent by 2010.[5] The policy provides a long-term framework to achieve the 20 percent goal without compromising power reliability or the financial stability of the Department and its customers.

On the consumption (demand) side, LADWP offers a number of Energy Efficiency and Demand-Side Management programs to encourage residential, commercial, institutional, and industrial customers to implement energy efficiency technologies and strategies. Programs for non-residential customers include rebates on energy efficient Heating, Ventilation, and Air Conditioning (HVAC) systems and refrigeration equipment, customer generation rebates, energy load monitoring, energy efficiency financing, and solar power incentives.

2.2 Natural Gas

2.2.1 State Regulations

As a public utility, the Southern California Gas Company (the Gas Company) is under the jurisdiction of the California Public Utilities Commission. The Gas Company provides service in accordance with the policies and rules on file with the Commission.

As previously discussed, Title 24 of the California Code of Regulations, also known as the energy efficiency standards, regulates energy consumption in new construction. The standards regulate energy

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5 City of Los Angeles Department of Water and Power, "Renewable Energy Policy," http://www.ladwp.com /ladwp/cms/ladwp005864.jsp. 2008.

consumed in buildings for purposes of heating, cooling, ventilation, water heating, and lighting. Title 24 is implemented through the local jurisdiction's plan check and permit process.

2.2.2 Local Regulations

2.2.2.1 Los Angeles General Plan

As previously discussed, the City's General Plan has three policies for the conservation of fossil fuels.[6] The first policy is to encourage energy conservation and petroleum product reuse through three programs: public information and energy conservation incentives programs, petroleum products recycling, and alternative fuel and energy sources research and use. The second and third policies are associated with oil drilling activities. Policy two is to support state and federal bans on oil drilling in Santa Monica Bay and new drilling along the California coast, and policy three is to protect neighborhoods from the potential hazards associated with drilling, extraction, and transport.

2.2.2.2 City of Los Angeles Green Building Program Ordinance

As previously discussed, in May 2007, the City of Los Angeles issued a Climate Action Plan to reduce greenhouse gas emissions 35 percent below 1990 levels by 2030. The Climate Action Plan specifically references the need to reduce the emissions of CO_2 and other greenhouse gases from buildings within the City. In order to achieve the goals laid out in the Climate Action Plan, the City Council approved the Green Building Program Ordinance, which the Mayor signed into law on April 22, 2008.

2.2.2.3 Gas Company Programs

The Gas Company provides several programs and information on conservation for both residential and commercial customers. Residential programs include rebates on energy efficient gas appliances, new construction energy efficiency incentives, and financing on home energy upgrades. Commercial programs include grants for a variety of more efficient retrofits and operations, funding for gas engines and pumps, and equipment rebates.[7]

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6 Los Angeles General Plan, Conservation Element, II-64.

7 Southern California Gas Company, "Energy Efficiency," http://www.socalgas.com/energyefficiency.

3.0 EXISTING CONDITIONS

3.1 Electricity Supply and Consumption

3.1.1 City of Los Angeles

Electricity is supplied and distributed to the City of Los Angeles by LADWP, which derives energy from a mix of conventional and alternative resources. The largest single source of power supply for LADWP is coal, which presently provides approximately 47 percent of the City's energy. Natural gas provides approximately 29 percent of the City's energy; nuclear energy accounts for approximately 9 percent; hydroelectricity, approximately 7 percent; and the remainder (approximately 8 percent) comes from renewable energy sources, which include hydrogeneration plants along the Los Angeles Aqueduct system, digester and landfill gas from sewage treatment plants and landfills, and purchases from windmill farms, hydroelectric plants and other renewable sources.

LADWP's coal-fueled power generation sources include two plants outside California: the Intermountain Generating Station in Utah and the Navajo Power Plant in Arizona. LADWP possesses rights to purchase slightly more than 48 percent of the Intermountain facility's output[8,9] and just over 21 percent of the Navajo facility's output,[10,11] with actual purchases varying according to need. According to the 2007 *Integrated Resources* Plan, LADWP plans to reduce its reliance on coal-fueled power sources over time and targets a reduction from 47 percent to 43 percent by 2010, to be replaced by renewable energy sources pursuant to LADWP's Renewable Portfolio Standard.[12] As of 2009, LADWP had adhered to this reduction and expects to have 20 percent of its energy needs met by alternative energy sources by 2010.[13]

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8 LADWP possesses rights to approximately 44.62 percent of the Intermountain Power Project (IPP) plants "capacity rating," or output, under the terms of a contract extending from February 1, 1983 through on June 15, 2027. It has also purchased an additional 4 percent entitlement through Utah Power and Light, which remains valid through the June 2027 contract termination date. LADWP can receive up to an additional 18.16 percent entitlement under an Excess Power Sales Agreement; however this percentage, or portions of this percentage, can be recalled from LADWP by other Intermountain Power Project participants, with defined advance notice.

9 Los Angeles Department of Water and Power, *Integrated Resources Plan*, Appendix A, Generation Resources, (2007), A-4.

10 LADWP is identified as a co-owner of the Navajo Generating Station, and is partially responsible for its operation and maintenance, in return for a 21.1 percent entitlement to its output, through participation in a Co-Tenancy Agreement, executed in 1976 with the Arizona Public Service Company, Nevada Power Company, the Salt River Project, Tucson Electric Power Company, and U.S. Department of Interior. The agreement is in effect until December 31, 2019.

11 Los Angeles Department of Water and Power, *Integrated Resources Plan*, Appendix A, Generation Resources, A-5.

12 Los Angeles Department of Water and Power, *Integrated Resources Plan*, Appendix D, Renewable Portfolio Standard.

13 Los Angeles Department of Water and Power, "Green Power," http://www.ladwp.com/ladwp/cms /ladwp000851.jsp. 2009.

LADWP closed its Mojave coal-fired generating plant in 2005, pending future possible conversion to other technology, and in the interim uses the excess distribution capacity to transport power purchased on the wholesale market.

LADWP owns and operates four natural gas-fueled electricity generating stations in the Los Angeles Basin: the Harbor, Haynes, Scattergood, and Valley generating stations. LADWP plans to reduce its natural gas usage for electricity generation to 22 percent from 30 percent by 2010, to be replaced with renewable energy sources.

Nuclear power is purchased from the Palo Verde Nuclear Generation Station in Arizona, in which LADWP maintains a 5.7 percent direct ownership position and 4 percent interest through its participation in the Southern California Public Power Agency, for a total 9.7 percent interest in the facility's output.

Hydroelectric power is derived from LADWP's Castaic Pumped Storage Power Plant, on the Los Angeles Aqueduct System, and from an entitlement to a portion of the output of Hoover Dam, on the Colorado River in Nevada. LADWP also procures power from a collection of "small hydro" operations, including facilities in the Owens Gorge and Owens Valley in eastern California and Los Angeles Aqueduct hydroelectric plants.

Finally, other renewable and distributed energy sources (i.e., nonpoint-sources such as sun, wind hydro, and tidal energy) include purchases from the Pleasant Valley Wind Project located near Evanston, Wyoming; digester gas (generated by the anaerobic breakdown of organic waste) at the Hyperion Treatment Plant used at LADWP's Scattergood Generating Station; LADWP-owned solar photovoltaic arrays in the Los Angeles area; landfill gas purchased from Bradley, Penrose and Lopez Canyon; and LADWP-installed fuel cells.

LADWP owns and operates 20 receiving stations[14] throughout the Los Angeles area that serve as collection points for large quantities of power received via a network of major overhead and underground transmission lines that connects them to the switching stations and power generation facilities in California, Utah, Nevada and Arizona. The receiving stations then lower the voltage of electricity to subtransmission levels, sending the power on to 120 distributing stations in the City. The distributing stations further reduce the voltage of the electricity supply for direct distribution via local transformers to large consumers, such as major manufacturing or commercial centers, or to 5- to 10-square-mile areas of residential and commercial end users. LADWP's local distribution system encompasses approximately 6,100 miles of overhead pole-lines and 2,200 miles of underground cable.

14 Los Angeles Department of Water and Power, *Integrated Resources Plan*, Appendix H-4.

LADWP currently serves 1.4 million electric service connections in the greater Los Angeles area. Business and industry within the City of Los Angeles consume about 70 percent of the electricity provided to customers, while residential customers account for consumption of the remaining 30 percent. In addition to serving these consumers, the LADWP lights public streets and highways, powers the City's water system, and sells electricity to other utilities.[15] While LADWP's customers consume approximately 10 percent of all the electricity within California, its transmission capacity is approximately 25 percent of California's total transmission capacity, thus ensuring its customers are provided with a reliable supply of energy from the lowest-cost resources.[16]

As a means of ensuring power system reliability, LADWP maintains a reserve of power generation resources in the event of a power system disturbance. As part of the electrical power grid that serves the western United States, Canada, and a small portion of northern Mexico, the LADWP is required to meet operational, planning reserve, and reliability criteria and resource adequacy standards established by the Western Electricity Coordinating Council and the North American Electric Reliability Corporation, which define system reserve margin requirements and other planning and operating criteria.[17] In addition, LADWP maintains ownership and operation of many of its electricity generation, transmission, and distribution assets. This structure enhances service reliability so that LADWP customers were not subject to rolling blackouts during statewide electrical crises in recent years.[18] LADWP forecasts a surplus of electricity continually until the year 2030.[19] LADWP does not forecast beyond the year 2030.

In 2007, the most recent year for which data is available, LADWP supplied 23.9 million megawatt hours (MWh) of electricity for the City's 1.4 million electric connections. LADWP predicts consumer energy consumption will increase at an average rate of 0.9 percent per year for the foreseeable future.[20] At the time of the Proposed Project buildout (2030), LADWP forecasts system-wide electricity consumption of 31.1 million MWh and a forecasted net energy load (supply) of 34.8 million MWh.[21] Energy consumption must be less than actual energy load for electricity to be supplied by LADWP, to allow for unexpected fluctuations in consumption and supply while maintaining the required electricity reserves.

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15 Los Angeles Department of Water and Power, "Power Past & Present," http://www.ladwp.com/ladwp/cms /ladwp001978.jsp. 2008.

16 Los Angeles Department of Water and Power, *Integrated Resources Plan*, H-1.

17 Los Angeles Department of Water and Power, *Integrated Resources Plan*, 17.

18 Los Angeles Department of Water and Power, *Integrated Resources Plan*, H-2.

19 Los Angeles Department of Water and Power, *Integrated Resources Plan*, B-5.

20 Los Angeles Department of Water and Power, *Integrated Resources Plan*, 16.

21 Los Angeles Department of Water and Power, *Integrated Resources Plan*, B-5.

3.1.2 LMU Campus

LMU currently occupies a campus of approximately 142 acres and approximately 61 buildings totaling approximately 2.78 million gross square feet (gsf), including academic, administrative, residential, and indoor athletic facilities. As of Fall 2008, LMU enrolled 6,868.4 Full-Time Equivalent (FTE) students,[22] including 5,441.8 undergraduates and 1,426.6 graduate students, and employed approximately 1484 FTE faculty and staff.[23]

For the year 2008, LMU's electricity consumption was approximately 83,383 kWh per day or 30,435 MWh annually.[24] As of Spring 2008, Loyola Marymount University used sustainable energy sources to supply a total of 9 percent of its electricity consumption. As of 2009, LMU uses 12 percent sustainable energy sources, including a total of 6 percent supplied by three photovoltaic systems located on the rooftops of University Hall, Gersten Pavilion, and Van der Ahe Library (which use a total of 5,065 solar panels to convert sunlight directly into approximately 1,826,100 kWh of electricity per year) and 6 percent purchased via renewable energy credits. Four buildings recently constructed on the LMU campus (Leavey 6, Del Rey North, Del Rey South, and the William H. Hannon Library) have obtained Leadership in Energy and Environmental Design (LEED®) certification from the U.S. Green Building Council. LEED is the nationally accepted benchmark for the design, construction and operation of high performance sustainable buildings.[25] As such, LEED-certified buildings adhere to energy efficiency standards beyond what is required by law. LMU further reduces its consumption of non-renewable electricity consumption by employing both passive and active energy efficiency practices. Passive energy efficiency can rely on such measures as designing a structure's windows, walls, and floors to collect, store, and distribute the sun's heat in the winter and reject solar heat in the summer. For example, passive energy efficiency practices can include the installation of cool roofing and heat rejecting window films. Active energy efficiency practices can include the use of systems and appliances which use non-renewable energy more efficiently while producing the same effect. For example, active energy efficiency practices can include

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22 FTE is a unit of measurement used to calculate enrollment for academic and master planning purposes, as opposed to student headcount. One undergraduate FTE student is defined as one undergraduate student taking 12 course units, which represents a full course load. Students taking fewer course units are considered to constitute a fraction of an FTE student, whereas students taking more than 12 units constitute more than one FTE student. One graduate FTE student is defined as one graduate student taking 9 course units, which represents a full course load. Graduate students taking fewer course units are considered to constitute a fraction of an FTE student, whereas students taking more than 9 units constitute more than one FTE student.

23 One full-time staff member works 40 hours per week. Two part-time staff members working 20 hours per week equals one full-time-equivalent staff person. A similar calculation is made for FTE faculty, except that due to reduced hours on campus associated with a part-time faculty member, three part-time faculty members equals one FTE faculty member.

24 Loyola Marymount University, 2009.

25 U.S. Green Building Council: LEED, www.usgbc.org/leed/. 2009.

the installation of energy efficient lights and appliances, as well as the upgrading of existing electrical systems.

3.2 Electricity Infrastructure

3.2.1 City of Los Angeles

LADWP owns and operates an extensive network of over 4,600 circuit-miles of alternating current (AC) and direct current (DC) transmission lines. Its internal grid is made up of a network of 115-kilovolt (kV), 138-kV, and 230-kV overhead and underground AC transmission lines. LADWP's long distance bulk power system consists of 230-kV, 287-kV, 345-kV, and 500-kV AC lines and ±500-kV DC lines.[26]

Portions of LADWP's electricity transmission system were constructed up to 70 years ago, and, accordingly, some of the infrastructure is reaching the end of its useful life and will require replacement.[27] Toward this end, LADWP has established a Power Reliability Program that seeks to maintain reliable electric power throughout the City.[28] Goals of this program include replacement of underground cable at a rate of 60 miles per year, over 75 years; utility pole replacement; infrastructure undergrounding; and regular replacement of other equipment.[29]

The area surrounding the LMU campus is served by a number of LADWP circuits. In the Proposed Project area, overhead 34.5-kV circuits are located along the LMU property line west of McConnell Avenue, and along Gleason Way. Overhead 4.8-kV circuits are located along McConnell Avenue, and underground the LMU property in the vicinity of 80th Street and Fordham Road.[30]

3.2.2 LMU Campus

LMU is currently served by two 34.5-kV LADWP feeders (electrical networks), one originating from the Westchester-Talbert Line and the other originating from the Airport-Talbert Line. These feeders contain switches, which provide the LADWP with the ability to switch over to an alternate feeder in case of a fault on one of their own system feeders. These 34.5-kV feeders in turn serve a 34.5-kVA-4800V, 5000/6250 Kilovolt-Amperes (kVA) transformer that currently meets the electrical needs of the campus. A transformer is an electrical device that increases or reduces the voltage of an alternating current by

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26 Los Angeles Department of Water and Power, *Integrated Resources Plan*, H-1.

27 Los Angeles Department of Water and Power, *Integrated Resources Plan*, 33-35.

28 Los Angeles Department of Water and Power, *Integrated Resources Plan*.

29 Los Angeles Department of Water and Power, *Integrated Resources Plan*.

30 Hal Messinger, Environmental Services, LADWP, personal communication on January 26, 2009.

mutual induction between primary and secondary coils or windings. The transformer and switches are owned and maintained by LADWP.

The LADWP transformer in turn serves 1200 Amp (A), 4.8-kV at the Central Plant building. The switchgear is equipped with a LADWP metering section, main 1000A breaker and five 5-kV, 600A switches. Five 5-kV feeders originating from the Central Plant switchgear distribute power to all the buildings on campus.

3.3 Natural Gas Supply and Consumption

Natural gas is supplied and distributed to the City of Los Angeles by the Southern California Gas Company. The Gas Company is the principal distributor of natural gas to a service area encompassing 23,000 square miles throughout most of Central and Southern California, from Visalia to the Mexican border. Natural gas is extracted from on- and off-shore sites in California, the San Juan Basin in northwestern New Mexico and southwestern Colorado (the largest single source), west Texas, the Rocky Mountains, southwestern Colorado, and western Canada.[31] Liquefied natural gas also may be available as future sources of natural gas supplies, such as the Costa Azul storage facility in Baja California, come on line.

The demand for natural gas is dependent upon the physical growth rate and temperature changes within a geographic area. The availability of natural gas is based upon present conditions of gas supply and regulatory policies. As a public utility company, the Gas Company is under the jurisdiction of the California Public Utilities Commission but can also be affected by actions of federal regulatory agencies including the Federal Energy Regulatory Commission. The conditions and availability of gas supply and services are, therefore, partially dependent on the regulatory actions of these agencies.

In 2008, the Gas Company estimated the consumption of approximately 2,694 million cubic feet (MMcf) of natural gas each day, or 983,310 MMcf per year. The Gas Company currently projects gas consumption across all its markets to grow at a nearly flat annual average rate of just 0.02 percent through 2030, owing to projections of modest economic growth, a decline in commercial and industrial demand, the ongoing housing slump, California Public Utilities Commission-mandated demand-side energy efficiency goals and renewable energy use goals, and continued increased use of non-utility pipeline systems for enhanced oil recovery projects. In 2030, the Gas Company projects an annual natural gas consumption of 988,785 MMcf and a projected net supply of 1,414,375 MMcf.[32]

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31 The California Gas and Electric Utilities, *2008 California Gas Report*, (2008) 76.

32 The California Gas and Electric Utilities, *2008 California Gas Report*, (2008) 97.

3.3.1 LMU Campus

As previously discussed, LMU occupies a campus of approximately 142 acres and approximately 61 buildings totaling approximately 2.78 million gsf, including academic, administrative, and residential facilities. As of Fall 2008, LMU enrolled 6,868.4 FTE students and employed approximately 1,484 FTE faculty and staff. For the year 2008, LMU's natural gas consumption was approximately 5,070 thousand cubic feet (Mcf) per month or 60,836 Mcf annually.[33]

As discussed above, recent buildings constructed on LMU's campus have obtained LEED certification from the US Green Building Council, which include energy efficient standards beyond what is required by law. LMU further reduces its consumption of non-renewable natural gas consumption by employing both passive and active energy efficient practices. Examples of these practices include the installation of cool roofing and heat rejecting window films; solar thermal heating of domestic hot water; and upgrading existing heating, ventilating, and air conditioning (HVAC) systems.

3.4 Natural Gas Infrastructure

As discussed above, natural gas is extracted from on- and off-shore sites in California, the San Juan Basin in northwestern New Mexico and southwestern Colorado, southwestern Colorado, and western Canada. It is then delivered via high-pressure transmission lines. As the gas is transported to one of four storage fields maintained by the Gas Company in Southern California (Aliso Canyon in Orange County, Honor Rancho in north Los Angeles County, Goleta on the Central Coast, and Playa del Rey on Los Angeles's Westside), the pressure is maintained with the assistance of compressors. The gas is then received at a storage field and redistributed through another series of transmission lines. Natural gas is distributed throughout the City by a network of transmission, supply, distribution, and local service lines. With the transition from major transmission lines to local service lines, the pressure of the natural gas is regulated down to the most efficient level of pressure for the end user.

The natural gas supply for the Proposed Project area originates from the Playa del Rey underground storage field. Gas is supplied to the Proposed Project area through a 4-inch main underneath Fordham Road, a 2-inch main underneath 77th Street, and a 2-inch main underneath McConnell Avenue. LMU is served by four gas meters: No. 1 is located west of McKay Hall in the central portion of campus; No. 2 is located north of the Central Plant in the northwestern corner of campus; No. 3 is located east of North Hall in the eastern portion of campus; and No. 4 is located in University Hall at the west end of campus. The campus distribution pressure is set at 5 pounds per square inch (psig). Gas pressure is further

33 Loyola Marymount University, 2009. Based on a conversion rate of 1,029 Btu/cubic foot (U.S. average for natural gas).

reduced to 0.5 psig at various buildings for use by small package boilers, kitchen equipment, kilns, and clothes dryers. Natural gas loads over the years have shifted from individual buildings to the Central Plant, which provides hot water via a looped distribution network. While the Gas Company provides natural gas service to the meters, LMU owns the distribution system downstream of the four main meters.[34]

4.0 IMPACT ANALYSIS

4.1 Methodology

The Proposed Project would result in energy consumption from Proposed Project operations (natural gas and electricity consumption by land uses). Energy consumption estimates for long term operations of Proposed Project uses are based on factors contained in the South Coast Air Quality Management District's (SCAQMD's) CEQA Air Quality Handbook (April 1993). The estimates include operational use of energy, such as electricity and natural gas consumption. Land use data used in calculating long-term operational energy consumption was provided by the Applicant. Sources used to describe existing and future energy resources and infrastructure include the Los Angeles Department of Water (LADWP) website, Southern California Gas Company (the Gas Company) website, LADWP's *2007 Integrated Resources Plan*, the Gas Company's *2008 California Gas Report*, and the City of Los Angeles General Plan. Potential Project impacts were analyzed primarily through consultation with the utility companies. Correspondence from LADWP and the Gas Company are included in **Appendix IV.L.4**.

4.2 Significance Thresholds

The *Los Angeles CEQA Thresholds Guide* indicates that the determination of significance shall be made on a case-by-case basis, considering the following factors:

- The extent to which the project would require new (off-site) energy supply facilities and distribution infrastructure, or capacity-enhancing alterations to existing facilities;
- Whether and when the needed infrastructure was anticipated by adopted plans; and
- The degree to which the project design and/or operations incorporate energy conservation measures, particularly those that go beyond City requirements.

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34 Michael G. Lotito, P.E., Director of Plant Operations, Facilities Management, Loyola Marymount University, personal communication on August 2008.

Appendix F, Energy Conservation, of the *State CEQA Guidelines* requires that "EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy."

The factors used in the *Los Angeles CEQA Thresholds Guide* to determine significant aesthetics impacts are inclusive of those provided in Appendix G of the *State CEQA Guidelines*. Therefore, based on these factors, the Proposed Project would have a significant impact related to energy if:

ENG-1 The Proposed Project would require new (off-site) energy supply facilities and distribution infrastructure, or capacity-enhancing alterations to existing facilities;

ENG-2 The Proposed Project would require needed infrastructure not anticipated by adopted plans; or;

ENG-3 Proposed Project design and/or operation does not incorporate energy conservation measures, particularly those that go beyond City requirements.

4.3 Project Design Features

The Proposed Project proposes the development of over approximately 508,000 net new gsf of academic, student support, and administrative facilities; approximately 28,000 net new gsf of indoor athletic facilities; and approximately 476,000 net new gsf of student residential and residential support facilities. Although not required by the City or other regulatory agency, LMU has committed to several measures that would reduce energy consumption on campus. These measures would meet or exceed minimum efficiency criteria for the state's most current Energy Conservation Standards for New Residential and Nonresidential Buildings (Title 24, Part 6, California Administrative Code). The measures include the following:

- Central Plant motors shall include variable frequency drivers to adjust electrical motor speed based on demand;
- Major building renovations and additions shall be integrated into the Campus Energy Management System, which is a set of computer-aided tools used to monitor, control, and optimize the performance of building HVAC and lighting systems;
- Future cooling loads shall be met using thermal energy storage, or an additional energy efficient chiller, or other comparable storage technologies;
- New and replacement buildings with flat roofs shall use white reflective material or comparable heat rejecting material on the building roofs;

- New appliances shall meet or exceed the minimum efficiency levels mandated in the California Code of Regulations;
- All irrigation shall use reclaimed water by Proposed Project buildout;
- All irrigation shall use automatic irrigation timers and at least 50 percent of the campus's non-turf areas shall include drought-tolerant or native plantings;
- All new and renovated buildings shall incorporate water conservation measures such as ultra-low-flush water closets and urinals, low-flow shower heads, and low-flow faucet aerators;
- All new construction shall be designed to the 2008 LEED Certified criteria (or an equivalent criteria) or better;
- Buildings shall be well sealed to prevent outside air from infiltrating and increasing interior space-conditioning loads;
- Buildings shall incorporate thermal insulation in walls and ceilings;
- Window systems shall be designed to reduce thermal gain and loss, thus, reducing cooling loads during warm weather and heating loads during cool weather; and
- High-intensity-discharge (HID) lamps, light-emitting diode (LED), or other energy efficient lighting shall be installed for all outdoor lighting to reduce electricity consumption.

4.4 Project Impacts

4.4.1 Electricity

ENG-1 Would the Project require new (off-site) energy supply facilities and distribution infrastructure, or capacity-enhancing alterations to existing facilities?

ENG-2 Would the Project require infrastructure improvements not anticipated by adopted plans?

4.4.1.1 Construction

Construction of the Proposed Project would consume minimal quantities of electricity (i.e., temporary use for lighting and small power tools). Therefore, electricity impacts during construction would be less than significant.

4.4.1.2 Operation

The Proposed Project would guide future campus improvements over the next 20 years and implement associated infrastructure upgrades as needed. Due to the long-term nature of the Proposed Project, the precise location and configuration of Proposed Project-related electric and natural gas infrastructure

improvements have not been finalized. Specific infrastructure improvements will be determined based on buildout of the Proposed Project over the next 20 years. The cost of service, upgrades, etc. would be determined at the time that schematic designs for individual Proposed Project components are developed and implemented.

As indicated in **Table IV.L.4-1, Proposed Project Electricity Consumption**, after buildout of the Proposed Project, the LMU campus is estimated to result in a gross electricity consumption of approximately 36,675.08 MWh per year. LMU's 2008 annual electricity consumption was approximately 30,434.80 MWh. Therefore, Proposed Project buildout is estimated to result in a net increase of approximately 6,240.28 MWh when compared to 2008 uses. This represents an approximately 20 percent increase over 2008 conditions. However, because the Proposed Project would be subject to the efficiency standards as described above in **Section 2.0**, **Regulatory Framework**, the annual campus electricity consumption rate per square foot would decrease approximately 11.7 percent, from 10.95 kWh per square foot to 9.67 kWh per square foot at buildout.

Additionally, as previously discussed, LADWP projects an annual systemwide electrical consumption of 31.1 million MWh at the time of Proposed Project buildout in 2030. LMU's projected increase in annual electricity consumption of 6,240.28 MWh at Proposed Project buildout represents 0.02 percent of LADWP's projection for that year, and is therefore within the anticipated service capacity of LADWP. Furthermore, LADWP forecasts having an energy supply of 34.8 million MWh in the year 2030, sufficient to meet the City's requirements, even with construction of the Proposed Project. Furthermore, LADWP has indicated that it would be able to meet Proposed Project demand.[35] The Proposed Project would not result in a substantial increase in electricity consumption and therefore would not exceed the existing or planned capacity of off-site LADWP electricity supply facilities. Impacts on electricity supply facilities would be less than significant and no mitigation measures are required.

35 Hal Messinger, Environmental Services, LADWP, personal communication on January 26, 2009.

Table IV.L.4-1
Proposed Project Electricity Consumption

Land Use	Units[1]	Efficiency[1]	Consumption Factor[2] (Kilowatt-hours/unit/year)	Annual Consumption[3] (Megawatt-hours)
Existing Campus				
Residential	942,000 gsf	0%	5.90	5,557.00
Non-Residential	1,836,000 gsf	0%	13.55	24,877.80
Total Existing	***2,778,000 gsf***			***30,434.80***
After Proposed Project Buildout				
Remainder Residential	572,000 gsf	0%	5.90	3,374.80
Remainder Non-residential	1,241,000 gsf	0%	13.55	16,815.55
New Residential	846,000 gsf	39.2%	3.59	3,037.14
New Non-residential	1,131,000 gsf	12.2%	11.89	13,447.59
Total Buildout	***3,790,000 gsf***			***36,675.08***
Net Change				**6,240.28**

Sources and Notes:

[1] *California Energy Commission, Impact Analysis: 2005 and 2008 Update to the California Energy Efficiency Standards, (June 2003 and November 2007).*
The efficiency percentages are reductions from baseline energy use due to revisions in the California Title 24 Building Code Standards. The efficiency percentages were based on the cumulative 'Percent Reduction from Baseline' values in Table 4 of the 2005 and 2008 Impact Analysis reports listed above. The 'Multi-Family' values were used to represent the residential buildings associated with the project. The 'Nonresidential' values were used to represent all other buildings associated with the project. Outdoor facilities were excluded from the analysis. Because the 2008 Impact Analysis uses the 2005 standard as a baseline, the cumulative percent reductions are based on the following mathematical formula: X% + Y% - (X% × Y%), where X represents the reduction from the 2005 standards and Y represents the reduction from the 2008 standards.

[2] *South Coast Air Quality Management District, CEQA Air Quality Handbook, (1993 and subsequent updates) A9-114.*
The electrical consumption factor for the 'Existing Campus, Subtotal' was derived from actual electricity consumption data for 2008 provided by Loyola Marymount University. The total electricity consumption (30,484.8 MWhr) was divided by the GSF of existing buildings on the campus, excluding outdoor facilities (2,778,000 GSF) for a per unit rate factor. Because data was not available for individual building types (e.g., residential vs. non-residential), the non-residential electricity consumption factor was based on Source 3 (i.e., 13.55 kW-hr/unit/yr). The residential factor was mathematically derived from the 'Subtotal' and 'Non-residential' factors. The 'Efficiency' percentages described under Source 2 were applied to the factors for the 'New' buildings.

[3] *Existing (2008) electricity consumption provided by Loyola Marymount University.*

gsf =gross square feet.

Electrical service to the site would be provided in accordance with LADWP Rules and Regulations, and Proposed Project components would be required to comply with sections of the State Building Energy Efficiency Standards, contained in Title 24 of the California Code of Regulations. LADWP has not indicated that changes to existing off-site infrastructure would be required to meet the Project's needs, however minor alterations to electricity transmission and distribution infrastructure on campus may be necessary to serve specific Proposed Project facilities. With implementation of **MM-ENG-1**, which

requires LMU to consult with LADWP prior to submittal of final site plans for approval by the City's Building and Safety Department, impacts on electricity transmission and distribution infrastructure would be reduced to a less than significant level.

ENG-3 Would Proposed Project design and/or operations incorporate energy conservation measures, including those that go beyond City requirements?

Prior to issuance of building permits needed for individual Proposed Project components, LMU is required to submit plans to the City's Building and Safety Department demonstrating that each proposed building or facility complies with the State's most current Energy Conservation Standards for New Residential and Nonresidential Buildings (Title 24, part 6, California Administrative Code). Additionally, LADWP's Energy Solutions Group encourages customers to consider design alternatives to maximize the efficiency of building envelopes, heating, ventilation, air conditioning, lighting, water heating, and mechanical systems. To further ensure appropriate energy conservation measures are incorporated into specific Proposed Project facilities, **MM-ENG-2** requires that LMU consult with LADWP's Energy Solutions Group regarding electricity consumption prior to submitting final plans for those facilities to the City's Building and Safety Department. Additionally, the Proposed Project would incorporate Proposed Project design features, as described above in **Section 4.3**, **Project Design Features,** which would meet or exceed minimum efficiency standards for Title 24. Therefore, Proposed Project impacts related to energy conservation (electricity) are anticipated to be less than significant.

4.4.2 Natural Gas

ENG-1 Would the Proposed Project require new (off-site) energy supply facilities and distribution infrastructure, or capacity-enhancing alterations to existing facilities?

ENG-2 Would the Project require infrastructure improvements not anticipated by adopted plans?

4.4.2.1 Construction

Construction of the Proposed Project is not anticipated to consume natural gas. Therefore, impacts to natural gas supply or infrastructure during construction would be less than significant.

4.4.2.2 Operation

As indicated in **Table IV.L.4-2** below, after buildout of the Proposed Project, the LMU campus is estimated to result in a gross natural gas consumption of approximately 74,640.13 Mcf per year. The 2008 natural gas consumption by existing uses was approximately 60,781.52 Mcf. Therefore, the Proposed Project is estimated to result in a net increase of approximately 13,858.61 Mcf in natural gas demand

when compared to 2008 uses. This represents an approximately 23 percent increase over 2008 conditions. However, because the Proposed Project would be subject to the efficiency standards as described above in Section 2.0, the annual natural gas consumption rate per square foot would decrease approximately 10 percent, from 21.9 cubic feet per square foot to 19.7 cubic feet per square foot at buildout. Additionally, as previously discussed, the Gas Company projects an annual consumption of approximately 988,785 MMcf at the time of Proposed Project buildout in 2030. LMU's projected increase in annual natural gas demand of 13,858.61 Mcf at Project buildout is 0.001 percent of the total consumption projected by the Gas Company for 2030, and is therefore within the anticipated service capacity of the Gas Company. Therefore, the Proposed Project would not result in a substantial increase in natural gas consumption and would not exceed the existing or planned capacity of off-site natural gas facilities. Impacts on natural gas supply facilities would be less than significant. Furthermore, at Proposed Project buildout in 2030, the Gas Company projects that supply of natural gas will greatly exceed consumption, even with construction of the Proposed Project.

The Gas Company has indicated that there are currently no known natural gas service problems or deficiencies in the Proposed Project area.[36] The Gas Company has not indicated that changes to existing off-site infrastructure and distribution systems would be required to meet the Proposed Project's needs, however minor alterations to natural gas transmission and distribution infrastructure on-campus may be necessary to serve specific Proposed Project facilities. With implementation of **MM-ENG-3**, which requires LMU to consult with the Gas Company prior to submittal of final site plans for approval by the City's Building and Safety Department, impacts on natural gas infrastructure would be reduced to a less than significant level.

36 Christopher Baker, Region Associate Engineer, The Gas Company, personal communication on January 28, 2009.

Table IV.L.4-2
Proposed Project Natural Gas Consumption

Land Use	Units[1]	Efficiency[1]	Consumption Factor[2] (Btu/unit/year)	Annual Consumption[3] (Mcf)
Existing Campus				
Residential	942,000 gsf	0%	7,491.43	6,803.12
Non-Residential	1,836,000 gsf	0%	30,252.60	53,978.40
Total Existing	***2,778,000 gsf***			***60,781.52***
After Proposed Project Buildout				
Remainder Residential	572,000 gsf	0%	7,491.43	4,164.33
Remainder Non-residential	1,241,000 gsf	0%	30,252.60	36,485.40
New Residential	846,000 gsf	21.6%	5,873.21	4,828.70
New Non-residential	1,131,000 gsf	12.3%	26,531.77	29,161.70
Total Buildout	***3,790,000 gsf***			***74,640.13***
Net Change				**13,858.61**

Sources and Notes:

[1] *California Energy Commission, Impact Analysis: 2005 and 2008 Update to the California Energy Efficiency Standards, (June 2003 and November 2007).*
The efficiency percentages are reductions from baseline energy use as the result of revisions to California Title 24 Building Code Standards. The efficiency percentages were based on the cumulative 'Percent Reduction from Baseline' values in Table 4 of the 2005 and 2008 Impact Analysis reports listed above. 'Multi-Family' values set forth in this report were applied to the residential buildings proposed under the Proposed Project. 'Non-Residential' values set forth in this report were applied to all other buildings (e.g., academic, administrative and athletic) proposed under the Proposed Project. Outdoor facilities were excluded from the analysis. Because the 2008 Impact Analysis uses the 2005 standard as a baseline, the cumulative percent reductions are based on the following mathematical formula: X% + Y% - (X% × Y%), where X represents the reduction from the 2005 standards and Y represents the reduction from the 2008 standards.

[2] *URBEMIS2007 Environmental Management Software, Natural Gas Consumption Factors.*
The Proposed Project value is based on the monthly average of commercial and office uses (i.e., average of 2.0 and 2.9, or 2.45 cubic feet/gsf/month). This value was multiplied by 12 for an annual value with a conversion rate of 1,029 Btu/cubic feet applied (based on U.S. average natural gas heat content). The natural gas consumption factor for the 'Existing Campus' was based on actual natural gas consumption data for 2008 provided by Loyola Marymount University. The total natural gas consumption (62,600.7 MMBtu) was divided by the GSF of existing buildings on the campus, excluding outdoor facilities (2,778,000 GSF) for a per unit rate factor. Because data was not available for individual building types (e.g., residential vs. non-residential), the non-residential natural gas consumption factor was derived from Urbemis modeling (i.e., 30,252.6 MMBtu/unit/yr). The residential factor was mathematically derived from the 'Subtotal' and 'Non-Residential' factors. The 'Efficiency' percentages described under Source 2 were applied to the factors for the 'New' buildings.

[3] *Consumption was converted from Btu into Mcf using the conversion rate of 1,029 Btu/cubic feet.*

gsf =gross square feet; Btu=British thermal unit; Mcf=thousand cubic feet.

ENG-3 Would Project design and/or operations incorporate energy conservation measures, including those that go beyond City requirements?

Prior to issuance of each building permit needed for individual Proposed Project components, LMU is required to submit plans to the City's Building and Safety Department demonstrating that each of the

Project's buildings complies with the State's most current Energy Conservation Standards for New Residential and Nonresidential Buildings (Title 24, part 6, California Administrative Code). To further ensure appropriate energy conservation measures are incorporated into specific Proposed Project designs, **MM-ENG-4** requires that LMU consult with the Gas Company regarding such measures prior to submitting final plans for those designs to the City's Building and Safety Department. Additionally, the Proposed Project would incorporate Proposed Project design features, as described above in **Section 4.3**, **Project Design Features**, which would meet or exceed minimum efficiency standards for Title 24. Therefore, Proposed Project impacts related to energy conservation (natural gas) are anticipated to be less than significant.

4.5 Project Design Features and Mitigation Measures

PDF-ENG-1 LMU shall implement the following energy conservation measures as part of the Proposed Project:

- Central Plant motors shall include variable frequency drivers to adjust electrical motor speed based on demand;
- Major building renovations and additions shall be integrated into the Campus Energy Management System, which is a set of computer-aided tools used to monitor, control, and optimize the performance of building HVAC and lighting systems;
- Future cooling loads shall be met using thermal energy storage, or an additional energy efficient chiller, or other comparable storage technologies;
- New and replacement buildings with flat roofs shall use white reflective material or comparable heat rejecting material on the building roofs;
- New appliances shall meet or exceed the minimum efficiency levels mandated in the California Code of Regulations;
- All irrigation shall use reclaimed water by Project buildout;
- All irrigation shall use automatic irrigation timers and at least 50 percent of the campus's non-turf areas shall include drought-tolerant or native plantings;
- All new and renovated buildings shall incorporate water conservation measures such as ultra-low-flush water closets and urinals, low-flow shower heads, and low-flow faucet aerators;
- All new construction shall be designed to the 2008 LEED Certified criteria (or an equivalent criteria) or better;
- Buildings shall be well sealed to prevent outside air from infiltrating and increasing interior space-conditioning loads;

- Buildings shall incorporate thermal insulation in walls and ceilings;
- Window systems shall be designed to reduce thermal gain and loss, thus, reducing cooling loads during warm weather and heating loads during cool weather; and
- High-intensity-discharge (HID) lamps, light-emitting diode (LED), or other energy efficient lighting shall be installed for all outdoor lighting to reduce electricity consumption.

4.5.1 Electricity

The following mitigation measures would address potential impacts related to electricity and natural gas and reduce impacts to less than significant levels:

MM-ENG-1 Prior to submittal of final site plans associated with specific Proposed Project facilities for approval by the City's Building and Safety Department, LMU shall consult with LADWP to determine the appropriate specifications for additional transmission or distribution facilities supplying electricity to the Proposed Project site. Upon finalization of these specifications, LMU shall fund its fair share of the cost of on-campus or off-campus infrastructure installation, as applicable.

MM-ENG-2 Prior to submittal of final plans for specific Proposed Project buildings or facilities to the City's Building and Safety Department demonstrating compliance with the State's Energy Conservation Standards, LMU shall consult with LADWP's Energy Solutions Group regarding the incorporation of possible energy efficiency measures into Proposed Project design.

4.5.2 Natural Gas

MM-ENG-3 Prior to submittal of final site plans associated with specific Proposed Project buildings or facilities for approval by the City's Building and Safety Department, LMU shall incorporate the appropriate specifications of necessary modifications to the natural gas conveyance system to the Proposed Project site as required by the Gas Company. Upon finalizing these specifications, LMU shall fund its fair share of the cost of on-campus or off-campus infrastructure installation, as applicable.

MM-ENG-4 Prior to submittal of final plans for specific Proposed Project buildings or facilities to the City's Building and Safety Department demonstrating compliance with the State's Energy Conservation Standards, LMU shall consult with the Gas Company regarding the incorporation of feasible energy conservation measures into Proposed Project design.

4.6 Level of Impact After Mitigation

With implementation of **MM-ENG-1** through **MM-ENG-4**, no significant impacts associated with energy resources are anticipated as the result of implementation of the Proposed Project.

4.7 Cumulative Impacts

4.7.1 Electricity

The potential for cumulative impacts on electricity supply, transmission and distribution is assessed based on consideration of the Proposed Project in combination with related projects identified in **Table III-I, Related Projects**, in **Section III, General Description of Environmental Setting**. As shown in **Table IV.L.4-3,** current known related projects together with the Proposed Project would result in a net electricity consumption of approximately 94,936.6MWh per year. Only projects located in the City of Los Angeles are identified in this cumulative analysis, because only they are served by the LADWP. As discussed earlier, LADWP forecasts system-wide electricity consumption of 31.1 million MWh and an energy supply of 34.8 million MWh in the year 2030. Therefore, LADWP will have an energy supply sufficient to meet anticipated use; the cumulative consumption of the Proposed Project plus related projects represents 0.27 percent of the total supply. Each related project would be required to comply with Title 24 energy efficiency standards. For this reason, implementation of the related projects is accounted for within the LADWP's projections, and operation of the Proposed Project plus related projects is not anticipated to result in a substantial increase in electricity consumption relative to available supply. With respect to LADWP's electricity distribution and transmission infrastructure, related projects would be required to identify and implement any needed on-site or off-site improvements in consultation with LADWP. Implementation of the Proposed Project, considered together with related projects, is not expected to result in a cumulatively significant impact to electricity supply or conveyance systems.

Table IV.L.4-3
Electrical Consumption –City of Los Angeles Related Projects

Related Project No.	Land Use	Quantity	Consumption Factor[1] (kilowatt-hours/year)	Annual Consumption (megawatt-hours)
1	Condo	98 du	5,626.5	551.4
	Retail	6,020 sf	13.55	81.6
11	Condo	230 du	5,626.5	1,294.1
20	School	420 stu[2]	8.2	120.5
21	Residential	3,246 du	5,626.5	18,263.6
	Retail	25,000 sf	13.55	338.8
	Office/Studio	1,570,000 sf	12.95	20,331.5
	Community Serving	65,000 sf	10.5	682.5
22	Stages	332,500 sf	12.95	4,305.9
	Production/Stage Support	797,400 sf	12.95	10,326.3
	Office	572,050 sf	12.95	7,408
23	Office	175,000 sf	12.95	2,266.3
	Residential	2,600 du	5,626.5	14,628.9
	Retail (Neighborhood)	150,000 sf	13.55	2,032.5
	Community Serving	40,000 sf	10.5	420
24	Condos	215 du	5,626.5	1,209.7
26	New Car Sales	42,391 sf	13.55	574.4
27	School[2]	600 stu[2]	8.2	172.2
28	Retail/Restaurant	31,000 sf	13.55	420.1
	Residential	539 du	5,626.5	3,032.7
29	Bank	3,621 sf	12.95	46.9
31	Hotel	180 du	9.95	1.8
33	School[2]	650 stu[2]	8.2	186.6
	Subtotal			*88,696.3*
	Proposed Project (net increase)			***6,240.3***
	Total			**94,936.6**

Source: Fehr & Peers, February 2009 and Impact Sciences, Inc.
Notes:
sf = square feet; du = dwelling unit; res = resident; emp = employee; stu =students
[1] *Consumption factors derived from SCAQMD CEQA Air Quality Handbook, 1993.*
[2] *Assumes 35 sf per child.*

4.7.2 Natural Gas

The potential for cumulative impacts on natural gas supply and conveyance is assessed based on consideration of the Proposed Project in combination with the related projects identified in **Table III-I,**

Related Projects, in **Section III, General Description of Environmental Setting**. As shown in **Table IV.L.4-3,** current known related projects together with the Proposed Project would result in a net natural gas consumption of 706,926 Mcf per year. As discussed earlier, the Gas Company estimates natural gas consumption will not increase appreciably over the next 22 years and will reach 988,785 MMcf by 2030; it further projects an available natural gas supply of 1,414,375 MMcf in the year 2030, which is greater than anticipated demand. The cumulative consumption of the Proposed Project plus related projects represents 0.05 percent of this supply. Each related project would be required to comply with Title 24 energy efficiency standards. For this reason, implementation of the related projects is accounted for within the Gas Company's projections, and operation of the Proposed Project plus related projects is not anticipated to result in a substantial increase in natural gas consumption relative to available supply. With respect to the Gas Company's conveyance infrastructure, related projects would be required to identify and implement any needed on-site or off-site improvements in consultation with the Gas Company. Implementation of the Proposed Project, considered together with related projects, is not expected to result in a cumulatively significant impact on natural gas supply or conveyance systems.

Table IV.L.4-4
Natural Gas Consumption – Related Projects

Land Use	Quantity	Consumption Factor[1] (cf/unit or sf/month)	Monthly consumption (cf)	Annual consumption (Mcf)
Condominiums	7,783	4,011.50	31,221,505	374,658
Apartments	6,368	4,011.50	25,545,232	306,542
Assisted Living/Senior	228	4,011.50	914,622	10,975
Hotel	794	4.8	3,811	46
Commercial/Retail[3]	771	2.9	2,236	27
Restaurant	20224	2.9	58,650	704
Office[4]	4,545	2	9,090	109
School	1,670	2	3,340	4
Civic[6]	76	2	152	2
Subtotal			*57,758,637*	*693,067*
Proposed Project (net increase)			***1,154,884***	***13,858***
Total			**58,913,521**	**706,926**

[1] *Consumption factors derived from SCAQMD CEQA Air Quality Handbook, 1993.*
[2] *Assumes 50% of restaurant is seating and 16 sf/seat. [(16 sf * 632 seats = 10,112 sf; 10,112 sf * 2 = 20,224 sf) (Source: County of Los Angles. Stevenson Ranch DEIR (Phase IV).) (1992).]*
[3] *Assumes 35 sf per child.*
Commercial uses include warehouse, new car sales, marina uses (excluding slips and vessels), and restaurants where a square footage was provided.
Office uses include banks and production studios.
Civic uses include fire stations and community centers.
du = dwelling units; sf = square foot; rm = rooms; cf = standard cubic feet; mcf = thousand cubic feet