# 4.2 ENERGY

## A. INTRODUCTION

This section of the Draft EIR analyzes the Project's potential impacts on energy resources, focusing on three energy resources: electricity, natural gas, and transportation-related energy (petroleum-based fuels). This analysis addresses both construction and operational impacts associated with the consumption of energy resources. This analysis was prepared pursuant to Appendix F of the CEQA Guidelines, which provides guidance on discussing energy implications in an EIR, with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. This section evaluates the demand for energy resources attributable to the Project and determines whether the current and planned electrical, natural gas, and petroleum-based fuel supplies and distribution systems are adequate to meet the Project's forecasted energy consumption. The information presented herein is based, in part, on the California Emissions Estimator Model (CalEEMod) outputs as calculated for **Section 4.1, Air Quality,** and **Section 4.3, Greenhouse Gases,** and on the calculations for this section as presented in **Appendix D, Energy Calculations**.

## B. ENVIRONMENTAL SETTING

### 1. Electricity

Electricity, a consumptive utility, is a man-made resource. The production of electricity requires the consumption or conversion of energy resources, including water, wind, oil, gas, coal, solar, geothermal, and nuclear resources, into energy. The delivery of electricity involves a number of system components, including substations and transformers that lower transmission line power (voltage) to a level appropriate for on-site distribution and use. The electricity generated is distributed through a network of transmission and distribution lines commonly called a power grid. Conveyance of electricity through transmission lines is typically responsive to market demands.

Energy capacity generally is measured in watts (W), while energy use is measured in watt-hours (Wh). For example, if a light bulb has a capacity rating of 100 W, the energy required to keep the bulb on for 1 hour would be 100 Wh. If ten 100 W bulbs were on for 1 hour, the energy required would be 1,000 Wh or 1 kilowatt-hour (kWh). On a utility scale, a generator's capacity is typically rated in megawatts (MW), which is 1 million watts; energy usage is measured in megawatt-hours (MWh), or in gigawatt-hours (GWh), which is 1 billion watt-hours.

Electrical power within the City of Pasadena ("City") is supplied by Pasadena Water and Power (PWP), which currently serves approximately 141,510 people.[1] Electricity provided by PWP is generated by PWP and other utilities, with power-generating facilities located both within the City and in other areas. These sources include natural gas-fired, coal-fired, hydroelectric, and nuclear plants. Existing renewable energy resources in the PWP portfolio include wind, solar, biogas, and geothermal facilities. In June 2015, the City adopted the 2015 Update to the Integrated Resource Plan (IRP).[2] The 2015 IRP Update considers the 20-year planning horizon from 2015 through 2034.

During 2015, the most recent year for which data are available, PWP delivered 1,160,586 MWh of electricity to its customers.[3] Projections prepared for the IRP indicate that the power demand for the City of Pasadena will be approximately 1,295,460 MWh in 2020 and 1,320,003 MWh in 2030.[4] Projected future electricity consumption growth for PWP is approximately 0.5 percent per year through 2030. Diversification of PWP's energy portfolio, increasing electricity from renewable energy, and new customer energy efficiency measures will help meet all the City's needs through the year 2030. The City's Project service area power demand specific to 2019, the expected buildout year for the proposed Project, is 1,291,427 MWh.[5]

PWP has adopted initiatives to increase its use of renewable energy in support of reducing greenhouse gas (GHG) emissions, reducing reliance on fossil fuels and meeting State mandates. For calendar year 2014, PWP exceeded the IRP renewable energy target of 26 percent and achieved a renewable portfolio standard (RPS) of 28.3 percent. PWP is planning for an RPS goal of 40 percent by 2020.[6]

## 2. Natural Gas

Natural gas is a combustible mixture of simple hydrocarbon compounds (primarily methane) that is used as a fuel source. Natural gas consumed in California is obtained from natural occurring reservoirs, mainly located outside the State, and delivered through high-pressure transmission pipelines. The natural gas transportation system is a nationwide network and, therefore, resource availability is typically not an issue. Natural gas satisfies almost one-third of the State's total energy requirements and is used in

1 City of Pasadena, Pasadena Water and Power (PWP), *2015 Annual Report* (2015). Available at http://www.cityofpasadena.net/waterandpower/Annual_Reports/.
2 City of Pasadena, PWP, 2015 Integrated Resource Plan Update (2015), http://cityofpasadena.net/waterandpower/IRP/.
3 Pasadena Department of Water and Power.
4 City of Pasadena, PWP, *2009 Integrated Resource Plan: Appendices*, 52. Exhibit 22: Summary Sales and Peak Forecast. Available at http://ww2.cityofpasadena.net/waterandpower/irp/Power_IRP_2009_Final_Report_Appendices.pdf.
5 City of Pasadena, PWP, *2009 Integrated Resource Plan: Appendices*, 52. Exhibit 22: Summary Sales and Peak Forecast. Available at http://ww2.cityofpasadena.net/waterandpower/irp/Power_IRP_2009_Final_Report_Appendices.pdf.
6 City of Pasadena, PWP, *2015 Annual Report* (2015). Available at http://www.cityofpasadena.net/waterandpower/Annual_Reports/.

electricity generation, space heating, cooking, water heating, and industrial processes, and as a transportation fuel. Natural gas is measured in terms of cubic feet (cf).

Natural gas is provided to the City of Pasadena by the Southern California Gas Company (SoCalGas). In 2016, approximately 2,681 million cubic feet (MMcf) of natural gas per day (978,565 MMcf annually) was consumed in Southern California.[7] SoCalGas projects total natural gas demand to decline due to modest economic growth; California Public Utilities Commission–mandated energy efficiency standards and programs; renewable electricity goals, declining commercial and industrial demand; and conservation savings linked to advanced metering infrastructure. Projected demand for natural gas in Southern California in 2019, the buildout date for the proposed Project, is anticipated to be 2,581 MMcf/day (942,065 MMcf annually). SoCalGas obtains the majority of its natural gas from out-of-State sources, mostly in the western United States and Canada. Future supplies of natural gas are anticipated to be adequate to meet projected Southern California demand through 2035.[8]

## 3. Transportation Energy

According to the California Energy Commission (CEC), transportation accounts for nearly 40 percent of California's total energy consumption and approximately 37 percent of the State's greenhouse gas emissions. In 2014, California consumed 545,839,000 barrels (22,925,238,000 gallons, or 42 gallons per barrel) of petroleum for transportation.[9] Incentive programs, such as the CEC's Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP), are helping the State to reduce its dependency on gasoline. For example, the ARFVTP is predicted to displace approximately 313.5 million gallons of gasoline and diesel by year 2025.[10] Several regulations adopted by California to reduce GHG emissions, such as Senate Bill (SB) 375, have the added benefit of reducing the State's demand on petroleum-based fuels by requiring reductions in vehicle miles traveled (VMT) and by reducing the carbon intensity of transportation fuels.

Petroleum is a worldwide commodity. The Organization of the Petroleum Exporting Countries (OPEC) forecasts the worldwide supply and demand in its *2016 World Oil Outlook* publication. The OPEC forecast for 2019, the projected buildout year for the proposed Project, projects a worldwide oil demand of 97.4 million barrels per day (mb/d) and a worldwide oil supply of 97.6 mb/d. OPEC's long-term projections

7 California Gas and Electric Utilities, *2016 California Gas Report* (2016). Available at https://www.socalgas.com/regulatory/documents/cgr/2016-cgr.pdf.

8 California Gas and Electric Utilities, *2016 California Gas Report* (2016). Available at https://www.socalgas.com/regulatory/documents/cgr/2016-cgr.pdf.

9 Independent Statistics & Analysis, US Energy Information Administration, "Table F15: Total Petroleum Consumption Estimates, 2014," https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_use_pa.html&sid=US.

10 California Energy Commission, *2016–2017 Investment Plan Update for the Alternative and Renewable Fuel and Vehicle Technology Program*, draft staff report, CEC-600-2014-014-SD (October 2015). Available at http://www.energy.ca.gov/2015publications/CEC-600-2015-014/CEC-600-2015-014-SD.pdf.

shows a similar trend; in 2040, worldwide oil demand is projected to be 109.4 mb/d, and worldwide oil supply is projected to be 109.6 mb/d.[11]

# C. REGULATORY FRAMEWORK

## 1. Federal

### *a. Transportation and Construction Fuel Efficiency*

The federal government sets fuel efficiency standards for construction equipment. Tier 4 efficiency requirements are contained in the Code of Federal Regulations.[12] Similarly, the federal government sets national fuel efficiency standards for light-duty vehicles pursuant to the Corporate Average Fuel Economy (CAFE) standards, which were updated in 2010.[13] It is, however, legally infeasible for individual municipalities to adopt more stringent fuel efficiency standards. Section 7543(a) of the Clean Air Act states: "No state or any political subdivision therefore shall adopt or attempt to enforce any standard relating to the control of emissions from new motor vehicles or new motor vehicle engines subject to this part." However, under Section 209 of the Clean Air Act, Congress provides the State of California unique authority to set vehicle standards that are more stringent than the federal standards. Under Section 177 of the Clean Air Act, other states are able to adopt the California standards in lieu of federal standards.

## 2. State

### *a. Senate Bill 1389*

SB 1389 (Public Resources Code Sections 25300–25323; SB 1389) requires the development of an integrated plan for electricity, natural gas, and transportation fuels. Pursuant to SB 1389, the CEC must adopt and transmit to the Governor and Legislature an Integrated Energy Policy Report every 2 years. The most recent version, the *2016 Integrated Energy Policy Report,* addresses the State's "loading order," reduction of demand response, renewable energy, electricity system, progress toward its 2050 GHG reduction goals, natural gas supplies, and the transportation sector's contribution to the State's GHG emissions.[14]

### *b. Assembly Bill 32*

Assembly Bill (AB) 32 (Health and Safety Code Sections 38500–38599; AB 32), also known as the California Global Warming Solutions Act of 2006, commits the State to achieving year 2000 GHG emission levels by 2010 and year 1990 levels by 2020. To achieve these goals, AB 32 tasked the California Public Utilities

11 Organization of the Petroleum Exporting Countries (OPEC), *2016 World Oil Outlook* (October 2016). Available at http://www.opec.org/opec_web/static_files_project/media/downloads/publications/WOO%202016.pdf.

12 40 CFR Parts 1039, 1065, and 1068. Adopted June 29, 2004 (69 Fed. Reg. 38958); updated 2014 (79 Fed. Reg. 46356).

13 75 Fed. Reg. 25324 et seq. (May 7, 2010); see also Health and Safety Code, sec. 39002 and 43000 et seq.

14 California Energy Commission, *2016 Integrated Energy Policy Report* (2016).

Commission and CEC with providing information, analysis, and recommendations to the California Air Resources Board regarding ways to reduce GHG emissions in the electricity and natural gas utility sectors.

### *c. California Energy Commission*

The CEC was created as the State's principal energy planning organization in 1974. As discussed below, Title 24, Part 6, of the California Code of Regulations (CCR) contains the CEC's 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings.

### *d. California Building Standards Code (Title 24)*

#### California Energy Code (Part 6)

The 2016 California Energy Code (CCR, Title 24, Part 6), also titled the 2016 Building Energy Efficiency Standards for Residential and Nonresidential Buildings, was adopted to ensure that building construction, system design, and installation achieve energy efficiency. The Building Energy Efficiency Standards are updated every 3 years; the 2016 version became effective January 1, 2017.[15] The 2016 Building Energy Efficiency Standards focus on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings, and include requirements to enable both demand reductions during critical peak periods and future solar electric and solar thermal system installations.

#### California Green Building Standards (Part 11)

The California Green Building Standards Code (CCR, Title 24, Part 11), commonly referred to as the CALGreen Code, went into effect on January 1, 2017. The 2016 CALGreen Code includes mandatory measures for residential development related to site development; water use; construction-waste reduction, disposal, and recycling; material conservation and resource efficiency; and environmental quality.[16]

#### Water Efficiency

The California Plumbing Code is codified in CCR Title 24, Part 5. Chapter 4 contains provisions requiring the installation of low-flow fixtures and toilets. Existing development is also required to reduce its wastewater generation and water use by retrofitting existing structures with water-efficient fixtures.[17] Additionally, Sections 5.303.2 and 5.303.4 provide for a minimum 20 percent reduction in water demand

15 International Code Council, 2016 Energy Code, Part 6, http://codes.iccsafe.org/app/book/toc/2016/California/Energy/index.html.

16 International Code Council, 2016 Green Building Standards Code, Part 11, http://codes.iccsafe.org/app/book/toc/2016/California/Green/index.html.

17 California Civil Code, Section 1101.1 et seq., SB 407 (2009).

and wastewater discharges. This would result in a concurrent reduction in energy demand to supply, treat, and convey water and wastewater.

## 3. Local

### *a. City of Pasadena General Plan Energy Element*

The City of Pasadena's General Plan contains an Energy Element that identifies issues regarding future energy supplies and strategies for the efficient use of energy. The following goals in the City's General Plan Energy Element would apply to the proposed Project:

- Goal 1.0: New buildings which exceed Title 24 standards and improved energy efficiency of existing buildings; and
- Goal 2.0: Energy efficient transportation of people and goods.

### *b. Pasadena Municipal Code*

The City of Pasadena has adopted an amended California Green Building Standards Code (14.04.500). In conformance with the City's building code, the Project would be required to comply with the performance levels of the amended California Green Building Standards Code. Mixed-use and multifamily residential buildings 4 stories or more in height are required to comply with Tier 1 Requirements (14.04.504, Section 307.1).

### *c. Pasadena Green City Action Plan*

Approved by the City Council on September 18, 2006, the Green City Action Plan is a progressive list of environmental initiatives for the City to take in its quest to become a sustainable and green community. The Green City Action Plan follows the framework of the United Nations Green Cities Declaration and Urban Environmental Accords, which contain 21 action items that lay the groundwork for addressing universal urban environmental issues with respect to energy, waste reduction, urban design, urban nature, transportation, environmental health, and water. Energy-related initiatives contained in the Green City Action Plan include increasing the use of renewable energy, reducing the City's peak electricity use, reducing GHG emissions by 25 percent by 2030, and achieving zero waste to landfills and incinerators by 2040.

# D. ENVIRONMENTAL IMPACTS

## 1. Methodology

Construction of the proposed Project would consume gasoline and diesel fuel from off-road construction equipment and on-road vehicles, such as vendor trucks, haul trucks, and construction employee commuting. During operation, transportation fuels would be used by vehicles entering and exiting the Project Site. Furthermore, natural gas would be used for heating, cooking, and other services, while electricity would be used to power the building, transport water to the Project Site, and deliver wastewater for treatment. The methodologies associated with these analyses are described below.

### *Construction*

Fuel usage estimates identified in the South Coast Air Quality Management District's (SCAQMD's) *CEQA Air Quality Handbook*[18] ("Handbook") were used to calculate the quantity of diesel fuel that would be used by construction equipment at the Project Site. Construction-related energy consumption was estimated using CalEEMod v. 2016.3.1. Developed by the California Air Pollution Control Officers Association, CalEEMod is a Statewide land use emissions computer model that estimates construction and operational emissions from a variety of land use projects. Because CalEEMod does not directly estimate fuel consumption, fuel rate and VMT data from the California Air Resources Board's EMFAC2014 model, v. 1.0.7, were used to develop fuel efficiency factors for gasoline and diesel fuel, in units of miles per gallon. Trip rate and trip length data from CalEEMod were used to estimate the total VMT of on-road motor vehicles that would occur from construction activities. The fuel efficiency factors were applied to the estimated VMT to determine the quantity of gasoline and diesel that would be used during construction. Consistent with CalEEMod, construction worker vehicles were assumed to consist of 50 percent gasoline-fueled light-duty automobiles (LDA) and 50 percent gasoline-fueled light-duty trucks (LDT1 and LDT2). Additionally, all vendor truck and haul trucks were assumed to be heavy heavy-duty diesel-fueled trucks (HHDT). Detailed calculations are included in **Appendix D**.

### *Operations*

Operational energy consumption was estimated using CalEEMod. CalEEMod default values were used for most of the analysis. CalEEMod was run for both baseline conditions and proposed Project conditions to calculate the net difference in energy consumption. As noted above in the discussion on construction, fuel efficiency factors were calculated from EMFAC2014. Additionally, the percent fleet (percent of gasoline vehicles vs diesel vehicles) was calculated using EMFAC2014. The percent fleet was then used to determine annual VMT, as taken from the Traffic Study in **Appendix F,** for gasoline versus diesel, with fuel

18 South Coast Air Quality Management District, *CEQA Air Quality Handbook* (1993).

efficiency factors then applied to VMT data to estimate the quantity of gasoline and diesel that would be used during Project operations.

The calculation of Project-related energy consumption (referred to as the Project-specific scenario) assumes compliance with a number of energy efficiency standards, as well as with policies aimed at reducing GHG emissions, such as described above in **Section 4.2.C, Regulatory Framework.**

## 2. Thresholds of Significance

The City of Pasadena has not adopted local thresholds of significance for energy. However, Appendix F of the CEQA Guidelines provides the following list of potential energy impacts that may be considered:

- 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.
- The effects of the project on local and regional energy supplies and on requirements for additional capacity.
- The effects of the project on peak and base period demands for electricity and other forms of energy.
- The degree to which the project complies with existing energy standards.
- The effects of the project on energy resources; and/or
- The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

For the purposes of this EIR, the Project would cause a significant impact related to energy if it would:

**Threshold 4.2-1: Conflict with adopted energy conservation plans.**

**Threshold 4.2-2: Use non-renewable resources in a wasteful and inefficient manner.**

## 3. Project Impacts

**Threshold 4.2-1: Would the Project conflict with adopted energy conservation plans?**

Construction of the proposed Project would consume energy from off-road construction equipment and on-road vehicular travel from vendor trucks, haul trucks, and construction employee commuting. Additionally, electricity would be required to deliver water to the Project Site for water for dust control. During operation, energy would be consumed by vehicles arriving at and departing from the apartments. Natural gas would be used for space heating and for other equipment, such as dryers and ovens. Electricity would be used to power the building, including HVAC equipment, lights, and appliances; to supply water

to the Project Site; and to deliver wastewater for treatment. Analyses of the results of this modeling for construction and operational energy consumption are provided below.

## Construction

As previously mentioned, construction of the proposed Project would require the use of various forms of energy. **Table 4.2-1, Summary of Energy Use during Construction**, summarizes the quantity of petroleum fuels and electricity that would be consumed during construction. As shown in **Table 4.2-1,** a total of 10,083,963 gallons of diesel fuel, 36,501,458 gallons of gasoline fuel, and 207 kilowatt-hours of electricity would be consumed during construction. When compared to the worldwide oil supply in 2019 (buildout) of 97.6 million barrels per day, and the City's 2019 (buildout) estimated power demand of 1,291,427 megawatt-hours, the oil and electricity usage during construction would be minimal.

Although construction would consume energy resources, construction activities would be temporary and would cease at the end of construction; therefore, there would be no long-term energy impacts associated with construction activities. The adopted energy conservation plans do not specifically discuss energy uses from construction activities. For this reason, and because the amount of fuel and electricity used during construction would be minimal and met by existing sources, impacts from construction would be less than significant.

## Operation

During operation of the proposed Project, energy would be consumed for a variety of purposes, including electricity consumption for lighting, laundry equipment, appliances, HVAC equipment, water supply and delivery, and other commercial operations; natural gas consumption for space heating, cooking, and laundry dryers; and transportation fuel consumption from motor vehicles driving to and from the site.

As discussed in **Section 4.1.D.1, Methodology,** above, CalEEMod was run for the Project utilizing the baseline conditions, and for the proposed Project in order to produce a net difference. The output for CalEEMod, takes into account that the Project would meet Title 24 energy requirements, including installation of high-efficiency lighting and the use of low-flow appliances for water conservation. Additionally, the apartments were assumed to meet Leadership in Energy and Environmental Design (LEED) Silver standards as required by the City's Green Building Ordinance.

**Table 4.2-1**
**Summary of Energy Use during Construction**

| Fuel Type | | Quantity |
|---|---|---|
| **Diesel** | | |
| On-site construction equipment | | 95,034 gallons |
| Off-site motor vehicles | | 9,988,929 gallons |
| | **Total** | 10,083,963 gallons |
| **Gasoline** | | |
| On-site construction equipment | | 0 gallons |
| Off-site motor vehicles | | 36,501,458 gallons |
| | **Total** | 36,501,458 gallons |
| **Electricity** | | 207 kWh |

*Source: Meridian Consultants, February 2017, Appendix D.*

Specific measures that would be implemented to achieve the CALGreen standards would be identified during the Project's design. Typical methods that could be incorporated into the Project design's to improve energy efficiency and meet CALGreen standards include use of efficient building techniques, such as insulation in walls and roofs, and use of high-performance glazing; installation of energy-efficient appliances, such as kitchen appliances and laundry rooms; high-efficiency lighting; design that maximizes reliance on natural lighting; and reduced water consumption through methods such as low-flow fixtures (faucets, showers, toilets) and water-efficient landscaping and irrigation.

**Table 4.2-2, Summary of Annual Energy Use during Operation**, summarizes the estimated annual energy consumption from operations for the proposed Project with incorporation of the energy conservation and efficiency measures that were previously described. Operation of the proposed Project would result in a permanent increase in electricity and natural gas consumption. During operations, the proposed Project would be required to be consistent with the City's General Plan Energy Element to reduce electricity demand by at least 10 percent. Furthermore, the building would be built in compliance with the CALGreen ordinance, including reducing water consumption by at least 20 percent. The Project would also meet the intent of LEED Silver standards, as required by the City's Green Building Ordinance. By meeting these requirements, the proposed Project would not conflict with an adopted energy conservation plan, and energy impacts would be less than significant.

**Table 4.2-2**
**Summary of Annual Energy Use during Operation**

| Source | Units | Project | Existing | Net Difference |
|---|---|---|---|---|
| **Electricity** | | | | |
| Apartments | kWh/yr | 1,278,960 | 778,113 | 500,847 |
| Parking structure | kWh/yr | 1,199,860 | 27,456 | 1,172,404 |
| Building Subtotal | kWh/yr | 2,478,820 | 805,569 | 1,673,251 |
| Indoor water use | kWh/yr | 208,359 | 152,706 | 55,653 |
| Outdoor water use | kWh/yr | 131,552 | 82,143 | 49,410 |
| Water Subtotal | kWh/yr | 339,912 | 234,849 | 105,063 |
| **Electricity Total** | kWh/yr | **2,818,732** | **1,040,418** | **1,778,314** |
| **Natural Gas** | | | | |
| Apartments | kBtu/yr | 3,697,000 | 2,350,630 | 1,346,370 |
| Parking structure | kBtu/yr | 0 | 0 | 0 |
| **Natural Gas Total** | kBtu/yr | **3,697,000** | **2,350,630** | **1,346,370** |
| **Mobile** | | | | |
| Diesel | Gallons | 7,053 | N/A | 7,053 |
| Gasoline | Gallons | 36,402 | N/A | 36,402 |

*Source: Meridian Consultants, February 2017,* ***Appendix D.***
*Notes: kWh/yr = thousand kilowatt-hours per year, kBtu/yr = thousand British Thermal Units per year*
*Electricity and Natural Gas for the Project is total operational usage. Net difference, takes total Project usage and subtracts existing uses. Mobile gasoline and diesel usage was calculated using VMT which was provided by the Pasadena Traffic Study. The VMT already assumes a net difference.*

**Threshold 4.2-2: Use non-renewable resources in a wasteful and inefficient manner?**

The proposed Project would be designed so that the demand for electricity and natural gas would be reduced to achieve the intent of LEED Silver certification at a minimum, as required by the City's Green Building Ordinance. Specific measures that could be incorporated into the Project's design are mentioned above in the discussion on Threshold 4.2-1.

A variety of travel mode choices would be available to the residents of the Project. On the corner of Los Robles Avenue on Walnut Street is a Metro bus stop serving routes 40 and 687/686. On the west side of Los Robles Avenue, along Walnut Street, is another Metro bus stop serving routes 20, 40, and 267/264. These bus routes allow residents to access the various parts of the City. Commuters can also use the Metro Gold Line for quick travel northeast to Glendora, south to Los Angeles, or southeast to East Los Angeles via the Lake Avenue Metro Gold Line station, located approximately 0.50 miles to the east of the Project Site, or the Memorial Park Metro Gold Line station, located approximately 0.50 miles southeast of the Project Site. As a result, the Project would result in a lower increase in consumption of transportation-

related fuels than might otherwise occur. Because energy efficiency standards would be incorporated into the Project's design and total building-related energy consumption would meet Title 24 energy requirements, energy would not be used in a wasteful and inefficient manner, and energy impacts would be less than significant.

The availability of electricity depends on adequate general capacity of the grid and sufficient fuel supplies. The PWP estimates that electricity consumption within PWP's planning area will be approximately 1,291,427 MWh per year by 2019, the anticipated Project buildout year.[19] As shown in **Table 4.2-2,** the proposed Project would use 1,778,314 kWh per year, which is 0.14 percent of the 2019 forecasted demand. PWP expects to have adequate electricity supply and transmission capability to meet the needs of its customers well beyond 2019. Because the proposed Project would use a low percentage of the total electricity demand projected for the future and PWP anticipates it will have sufficient capability to meet future needs, construction and operation of the proposed Project would not require the expansion of existing facilities or the construction of new electricity-generating or transmission facilities.

Natural gas consumption would increase during Project operations. The 2016 California Gas Report indicates that sufficient capacity exists in the utility network to meet future demand in Southern California. The total gas supply available in 2019 is estimated to be 2,581 MMcf per day,[20] equivalent to 966,558,560 million British thermal units (Btu) per year, assuming that the typical heating value of natural gas is 1,026 Btu per cubic foot.[21] As shown in **Table 4.2-2**, the proposed Project would use approximately 1,346,370 thousand Btu (kBtu) per year, which is 0.00014 percent of the 2019 forecasted demand. Because the proposed Project would use a low percentage of the total natural gas demand projected for the future and SoCalGas anticipates it will have sufficient capability to meet future needs, construction and operation of the proposed Project would not require the expansion of existing facilities or the construction of new natural gas facilities.

Although operation of the proposed Project would increase electricity and natural gas consumption, usage would meet Title 24 energy requirements, and would not require new or expanded energy facilities. As a result, impacts related to energy associated with operation of the proposed Project would be less than significant.

19 City of Pasadena, PWP, *2009 Integrated Resource Plan: Appendices*, 52. Exhibit 22: Summary Sales and Peak Forecast. Available at http://ww2.cityofpasadena.net/waterandpower/irp/Power_IRP_2009_Final_Report_Appendices.pdf.

20 California Gas and Electric Utilities, *2016 California Gas Report* (2016). Available at https://www.socalgas.com/regulatory/documents/cgr/2016-cgr.pdf.

21 The Climate Registry, "Table 12.1: U.S. Default Factors for Calculating CO2 Emissions from Fossil Fuel and Biomass Combustion (April 2015), Available at https://www.theclimateregistry.org/wp-content/uploads/2016/03/2015-TCR-Default-EFs.pdf.

# E. CUMULATIVE IMPACTS

The area of analysis for cumulative effects related to electricity is PWP's service area, and the area of analysis for cumulative effects related to natural gas is SoCalGas' service area. The area of analysis for transportation fuels considers cumulative projects and growth within the City of Pasadena. Expected growth in these areas would increase the demand for electricity, natural gas and transportation fuels. As identified in Table 4.0-1 (see **Section 4.0, Environmental Impact Analysis**), there are 64 known projects that could contribute to cumulative impacts in the City of Pasadena.

## 1. Electricity

Buildout of the proposed Project and additional forecasted growth in the City, including the 64 cumulative projects, would increase electricity consumption within the PWP service area. As such, there would be a cumulative increase in the demand for electricity. The PWP estimates that approximately 1,291,427 MWh per year of electricity would be consumed within the area by 2019. The proposed Project would account for 0.14 percent of the forecasted demand in PWP's planning area within this period. Although future development would result in the irreversible use of both renewable and nonrenewable electricity resources during Project construction and operation, the use of such resources would be consistent with growth expectations for PWP's service area. Furthermore, as with the proposed Project, all new projects would be required to comply with CALGreen building standards. Additionally, the Green City Action Plan identifies specific policies to reduce energy consumption, such as increasing the use of renewable energy. As previously stated, PWP has adequate electricity supply capability to meet the needs of its future customers.

Electricity infrastructure is typically expanded in response to increasing demand, and system expansion and improvements by PWP are ongoing. As described in PWP's IRP, PWP would continue to expand delivery capacity as needed to meet demand increases within its service area. The IRP takes into account future energy demand, advances in renewable energy resources and technology, energy efficiency, conservation, and forecast changes in regulatory requirements. Development projects within the PWP service area would also be anticipated to incorporate site-specific infrastructure improvements, as necessary. As such, cumulative impacts with respect to electricity infrastructure would be less than significant.

## 2. Natural Gas

Buildout of the proposed Project and additional forecasted growth in the region, including the 64 related projects, would increase natural gas consumption within the SoCalGas service area. As such, there would be a cumulative increase in the demand for natural gas. SoCalGas estimates that 2,581 MMcf per day of

natural gas would be consumed in Southern California in 2019[22] or 966,558,560 million Btu per year. The proposed Project would account for 0.00014 percent of the forecasted demand in SoCalGas's planning area within this period. Although there would be a permanent increase in natural gas consumption, all future projects would be built with energy conservation features as required by the CALGreen building code. As such, there would be a net decrease in natural gas consumption. As previously stated, future supplies of natural gas are anticipated to be adequate to meet projected future demand.

Natural gas infrastructure is typically expanded in response to increasing demand, and system expansion and improvements by SoCalGas occur as needed. It is expected that SoCalGas would continue to expand delivery capacity if necessary to meet demand increases within its service area. Development projects within its service area would also be anticipated to incorporate site-specific infrastructure improvement, as appropriate. As such, cumulative impacts with respect to natural gas infrastructure would be less than significant.

## 3. Transportation Energy

Buildout of the proposed Project and additional forecasted growth in the City, including the 64 cumulative projects, would increase demand for transportation fuels. As described above, California consumed 545,839,000 barrels (22,925,238,000 gallons, or 42 gallons per barrel) of petroleum for transportation in 2014.[23] As shown in **Table 4.2-2**, with implementation of the proposed Project, the incremental increase in the consumption of gasoline citywide would be 36,402 gallons, which is 0.0002 percent of existing Statewide consumption. Several regulatory measures in California are expected to decrease transportation fuel usage in the future, which would reduce future demand for gasoline. In Pasadena, the City's Green City Action Plan includes a goal to expand public transportation coverage to within 0.5 kilometer of all City residents, which would also reduce demand for transportation fuels. Petroleum products are global, market-driven commodities. Worldwide oil consumption is projected to increase to 97.4 mb/day by 2019, the anticipated buildout year for the proposed Project, and worldwide oil supplies are expected to be 97.6 mb/day in that year. In the long term, adequate supplies are anticipated well beyond the Project buildout date. Although there would be a cumulative increase in the consumption of petroleum-based fuels, because future supplies would be adequate to meet projected demand, cumulative impacts relating to transportation fuels would be less than significant.

22 California Gas and Electric Utilities, *2016 California Gas Report* (2016). Available at https://www.socalgas.com/regulatory/documents/cgr/2016-cgr.pdf.

23 Independent Statistics & Analysis, US Energy Information Administration, "Table F15: Total Petroleum Consumption Estimates, 2014," https://www.eia.gov/state/seds/data.php?incfile=/state/seds/sep_fuel/html/fuel_use_pa.html&sid=US.

## F. MITIGATION MEASURES

Project-level and cumulative impacts on energy consumption would be considered less than significant. Therefore, no mitigation measures are required.

## G. LEVEL OF SIGNIFICANCE AFTER MITIGATION

Project-level and cumulative impacts on energy consumption would be considered less than significant.