4.11 ENERGY

4.11.1 Introduction

This section of the Recirculated Draft SEIR (SEIR) evaluates potential impacts associated with the consumption of energy that would result from the implementation of the proposed UC Merced 2020 LRDP (proposed project).

4.11.2 Environmental Setting

Electricity

Electricity generated within California in 2017 was from natural gas (43 percent), renewable resources (29 percent), large hydroelectric (18 percent), nuclear (9 percent), and coal (<1 percent) (CEC 2018a). The rest of the electricity used in the state was generated within the United States either in the Southwest or Pacific Northwest. The State's power mix, based on in-state generation and out-of-state purchases in 2017 was comprised of natural gas (34 percent), renewable resources (29 percent), large hydroelectric (15 percent), coal (4 percent), nuclear (9 percent), and additional unspecific sources of power (9 percent) (CEC 2018a). In 2017, the total system power generated was 292,039 GWh, which is up about 0.5 percent from 2016's total system electric generation of 290,567 GWh (CEC 2018a).

In 2016-17, the campus used 21.6 million kilowatt hours (kWh) of electricity, with peak daily consumption occurring in November. The monthly usage ranged between 1.4 million kWh and 2.2 million kWh (UCM 2018). Of the electricity used on the campus, about 11 percent (2.3 kWh) were generated on-site by the campus solar array.

The campus is a part of the California Independent System Operator's Fresno local area. Currently, Pacific Gas and Electric (PG&E) provides electricity to the City of Merced and the UC Merced campus. The campus site is within PG&E's Wilson 115-kilovolt (kV) subarea. There are three PG&E transmission lines near the campus site: the 230-kV Belotta-Herndon line that originates at the Wilson Substation south of Childs Avenue and terminates north of Bellevue and west of Highway 59; the 115-kV Wilson-Atwater line; and the 70-kV Merced-Merced Falls line.

Natural Gas

In 2012, natural gas used within California was extracted in the state (9 percent), Canada (16 percent), the Rocky Mountain region of the United States (40 percent), and in the southwest United States (35 percent) (CPUC 2017). In 2012, natural gas was used in California to produce electricity (45.6 percent), in

residential uses (21 percent), in industrial uses (25 percent), and in commercial uses (8.6 percent). The total natural gas usage in 2012 was 2,313,000 BBTU/year (CEC 2016a).

In 2017-18, the campus used a total of 571,000 therms of natural gas. PG&E currently supplies Merced County, including the existing UC Merced campus, with natural gas. The main pipeline serving the City of Merced is an 8-inch-diameter transmission pipeline that parallels Highway 99 through Merced. The campus is connected to the regional natural gas distribution system via a pipeline aligned along Lake Road. Additional distribution lines and hook-ups are generally constructed on an "as-needed" basis.

Petroleum Based Fuel

In 2015, 15.1 billion gallons of gasoline (non-diesel) and 1.6 billion gallons of diesel fuel were sold statewide (CEC 2018b). In 2016, 101 million gallons of gasoline were purchased in Merced County, in addition to 59 million gallons of diesel fuel (CEC 2016b). Both gasoline and diesel consumption in 2016 were slightly lower than the California Energy Commission's (CEC) projections.

UC Merced has a transportation fleet of approximately 75 vehicles and 59 golf carts. There is an on-campus fueling station, located in the corporation yard, that is used for grounds equipment only (i.e., not for UC Merced vehicles.

4.11.3 Regulatory Considerations

Federal Regulations

Energy Policy and Conservation Act

Enacted in 1975, this legislation established fuel economy standards for new light-duty vehicles sold in the U.S. The law placed responsibility on the National Highway Traffic and Safety Administration (a part of the U.S. Department of Transportation) for establishing and regularly updating vehicle standards. The U.S. EPA administers the Corporate Average Fuel Economy (CAFE) program, which determines vehicle manufacturers' compliance with existing fuel economy standards. Since the inception of the CAFE program, the average fuel economy for new light-duty vehicles (autos, pickups, vans, and SUVs) steadily increased from 13.1 mpg for the 1975 model year to 27.5 mpg for the 2012 model year and is proposed to increase to 54.5 by 2025.

Energy Policy Act of 2005

On August 8, 2005, the President signed the National Energy Policy Act of 2005 into law. This comprehensive energy legislation contains several electricity-related provisions that aim to:

- Help ensure that consumers receive electricity over a dependable, modern infrastructure;
- Remove outdated obstacles to investment in electricity transmission lines;
- Make electric reliability standards mandatory instead of optional; and
- Give federal officials the authority to site new power lines in Department of Energy-designated national corridors in certain limited circumstances

Vehicle Standards

Other regulations have been adopted to address vehicle standards, including the U.S. EPA and the National Highway Safety Administration (NHTSA) joint rulemaking for vehicle standards.

- On March 30, 2009, the NHTSA issued a final rule for model year 2011 (NHSTA 2009).
- On May 7, 2010, the U.S. EPA and the NHTSA issued a final rule regulating fuel efficiency and GHG emissions pollution from motor vehicles for cars and light-duty trucks for model years 2012–2016 (U.S. EPA 2010).
- On August 9, 2011, U.S. EPA and NHTSA issued a Supplemental Notice of Intent announcing plans to propose stringent, coordinated federal GHG emissions and fuel economy standards for model year 2017-2025 light-duty vehicles (U.S. EPA and NHTSA 2011).
- NHSTA intends to set standards for model years 2022-2025 in a future rulemaking (NHSTA 2012).
- In addition to the regulations applicable to cars and light-duty trucks, on August 9, 2011, the U.S. EPA and the NHTSA announced fuel economy and GHG emissions standards for medium- and heavy-duty trucks that applies to vehicles from model year 2014–2018 (U.S. EPA 2011).
- Energy Independence and Security Act (EISA)
- Among other key measures, the EISA would do the following, which would aid in the reduction of national GHG emissions, both mobile and non-mobile:
- Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
- Prescribe or revise standards affecting regional efficiency for heating and cooling products, procedures for new or amended standards, energy conservation, energy efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

While superseded by NHTSA and U.S. EPA actions described above, EISA also set miles per gallon targets for cars and light trucks and directed the NHTSA to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.

Additional provisions of the EISA address energy savings in government and public institutions, promoting research for alternative energy, additional research in carbon capture, international energy programs, and the creation of "green jobs."

Regulations for Greenhouse Gas Emissions from Passenger Cars and Trucks and Corporate Average Fuel Economy Standards

In October 2012, U.S. EPA and NHSTA, on behalf of the Department of Transportation, issued final rules to further reduce GHG emissions and improve CAFE standards for light-duty vehicles for model years 2017 and beyond (77 FR 62624). This program would increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) limiting vehicle emissions to 163 grams of carbon dioxide (CO2) per mile for the fleet of cars and light-duty trucks by model year 2025 (77 FR 62630). In January 2017, U.S. EPA Administrator signed a Final Determination to maintain the current GHG emissions standards for model year 2022-2025 vehicles. However, on March 15, 2017, U.S. EPA Administrator, and Department of Transportation Secretary announced that U.S. EPA intends to reconsider the Final Determination. On April 2, 2018, U.S. EPA Administrator officially withdrew the January 2017 Final Determination, citing information that suggests that these current standards may be too stringent due to changes in key assumptions since the January 2017 Determination. According to the U.S. EPA, these key assumptions include gasoline prices and overly optimistic consumer acceptance of advanced technology vehicles. The April 2nd notice is not U.S. EPA's final agency action. The U.S. EPA intends to initiate rulemaking to adopt new standards. Until that rulemaking has been completed, the current standards remain in effect (U.S. EPA 2017, U.S. EPA 2018).

Energy Star Program

In 1992, the U.S. EPA introduced Energy Star as a voluntary labeling program designed to identify and promote energy-efficient products to reduce greenhouse gas emissions. The program applies to major household appliances, lighting, computers, and building components such as windows, doors, roofs, and heating and cooling systems. Under this program, appliances that meet specifications for maximum energy use established under the program are certified to display the Energy Star label. In 1996, U.S. EPA joined with the Energy Department to expand the program, which now also includes qualifying commercial and industrial buildings, and homes.

State Regulations

Title 24

Title 24, Part 6, of the California Code of Regulations contains the California Energy Commission's (CEC) Energy Efficiency Standards for Residential and Nonresidential Buildings. Title 24 was first established in 1978, in response to a legislative mandate to reduce California's energy consumption. Since that time, Title 24 has been updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

On April 23, 2008, the CEC adopted the 2008 standards, which applied to projects that submitted an application for a building permit on or after January 1, 2010. The CEC adopted the 2008 standards for a number of reasons: (1) to provide California with an adequate, reasonably priced, and environmentally sound supply of energy; (2) to respond to Assembly Bill 32 (AB 32; the Global Warming Solutions Act of 2006), which requires California to reduce its greenhouse gas emissions to 1990 levels by 2020; (3) to pursue the statewide policy that energy efficiency is the resource of choice for meeting California's energy needs; (4) to act on the findings of California's Integrated Energy Policy Report, which indicate that the 2008 Standards are the most cost-effective means to achieve energy efficiency, reduce the energy demand associated with water supply, and reduce greenhouse gas emissions; (5) to meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures in the update of all state building codes; and (6) to meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards.[1] In 2013, updates were made to the 2008 Title 24 standards (effective January 1, 2014).

The California Green Building Standards Code, which is Part 11 of the Title 24 Building Standards Code, is commonly referred to as the CALGreen Code. The 2008 edition, the first edition of the CALGreen Code, contained only voluntary standards. The CALGreen Code was last updated in 2016 and became effective January 2017. The CALGreen Code identifies mandatory requirements for new residential and nonresidential buildings (including buildings for retail, office, public schools, and hospitals) throughout California. The CALGreen Code contains requirements for construction site selection, stormwater control during construction, construction solid waste reduction, indoor water use reduction, building material selection, natural resource conservation, site irrigation conservation, and more. Additionally, this code encourages buildings to achieve exemplary performance in the area of energy efficiency.

[1] See http://www.energy.ca.gov/title24/2008standards/index.html, 2013.

AB 32, Executive Order S-3-05, Executive Order B-30-15, and SB 32

In addition to Title 24, a number of state laws and regulations, including AB 32, Executive Order S-3-05, Executive Order B-30-15, and SB 32, are anticipated to result in the future regulation of energy resources in California. (See **Section 4.3, Greenhouse Gas Emissions,** for additional information on AB 32, SB 32, Executive Order S-3-05, and Executive Order B-30-15.) In order to achieve the GHG emission reductions targeted under these state laws, it is generally accepted that California will need to improve its overall energy efficiency as well as continue to increase its use of renewable energy resources. Pursuant to AB 32 and SB 32, the California Air Resources Board (CARB) will work with other state agencies (including the CEC), to implement feasible programs and regulations that reduce emissions and improve energy efficiency.[2]

Senate Bill 350

Senate Bill 350 (SB 350) was signed into law in 2015. The legislation requires that, by 2030, 50 percent of all electricity provided by power plants in California must be from renewable sources. SB 350 further requires the CEC to establish annual targets for statewide energy efficiency savings and demand reductions that would achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas by retail customers by 2030. The bill requires the Public Utilities Commission (PUC) to establish efficiency targets for investor-owned electrical and gas corporations consistent with the 2030 goal, and the CEC to establish annual targets for energy efficiency savings and demand reductions for local publicly owned electric utilities consistent with the 2030 goal. Each retailer of electricity must regularly file an integrated resource plan (IRP) for review and approval. This bill requires that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be at 50 percent of the total sold energy by December 31, 2030.

Other Energy Related Statutes and Executive Orders

Additional legislation and executive orders focused on energy efficiency in California are highlighted briefly below:

- Senate Bill 107: This legislation, which addresses California's Renewables Portfolio Standard (RPS), required retail sellers of electricity to procure 20 percent of retail sales from renewable energy.
- Assembly Bill 1613: This legislation, also known as the Waste Heat and Carbon Emissions Reduction Act, was designed to encourage the development of new combined heat and power systems in California with a generating capacity of up to 20 megawatts (MW).

[2] See http://www.arb.ca.gov/cc/ghgsectors/ghgsectors.htm#electric, September 13, 2013 (highlights targeted improvements for the energy sector).

- Senate Bill 1: This legislation enacted the Governor's Million Solar Roofs program and has an overall objective of installing 3,000 MW of solar photovoltaic systems.

- Senate Bill 1389: This legislation requires the CEC to prepare a biennial integrated energy policy report that contains an assessment of major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety.

- Executive Order S-14-08: This order established accelerated RPS targets—specifically 33 percent by 2020.

- Executive Order S-21-09: This order required CARB to adopt regulations, increasing California's RPS to 33 percent by 2020.

- Senate Bill SBX1-2: This legislation established new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020.[3]

Local Plans and Policies

University of California Sustainable Practices Policy

The University of California Sustainable Practices Policy, most recently updated in August 2018, is a system-wide commitment to minimize the University's impact on the environment and reduce its dependence on non-renewable energy sources. The Sustainable Practices Policy establishes goals in nine areas of sustainable practices: green building, clean energy, transportation, climate protection, sustainable operations, waste reduction and recycling, environmentally preferable purchasing, sustainable foodservice, sustainable water systems. More information on the Sustainable Practices Policy is presented in **Section 4.3, Greenhouse Gas Emissions**.

Sustainability Strategic Plan 2017-2022

The Sustainability Strategic Plan 2017-2022 lays out UC Merced's sustainability goals for the next five years. The plan was designed as a living document to be reviewed annually with a progress report that outlines accomplishments.

[3] PG&E is currently under contract through 2020 to procure 37 percent of retail sales from renewable energy sources.

The Sustainability Goal is to:

> "Create and institutionalize an ever evolving collection of sustained, supported, and meaningful projects/ actions that develop resiliency and create practical lasting solutions."
>
> This goal was designed to specifically align to five of the UC Merced Campus Vision goals including:
>
> > **Sustainable By Design**: Through the incubation and support of new and emerging sustainability initiatives.
> >
> > **Enriching the Valley By**: Encouraging and supporting collaborative projects and initiative efforts that will impact the Central Valley.
> >
> > **Partnering with an Emerging California**: Supporting collaborative efforts to partner with broad groups of stakeholders throughout California to support UC Merced's sustainability efforts.
> >
> > **Leading Creativity and Innovation**: Demonstrating ingenuity and originality through initiatives that advance campus wide sustainability.
> >
> > **Culture of Inquiry, Discovery and Learning**: Acquiring new knowledge that advances campus sustainability efforts.

4.11.4 Impacts and Mitigation Measures

Significance Criteria

This SEIR uses significance criteria derived from Appendix G of the *State CEQA Guidelines*. For the purposes of this SEIR, implementation of the 2020 LRDP would result in a potentially significant environmental impact if it:

- Involves wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
- Conflicts with or obstruct a state or local plan for renewable energy or energy efficiency.

Methodology

CEQA requires the environmental document to report the total energy resources that would be used in association with a proposed project during construction and operation of the project. The methodology

used to estimate the construction-phase energy use is described in **LRDP Impact EN-1** below. With respect to energy consumption during occupancy/operation, the increased electricity and natural gas demand due to operation/occupancy of the proposed project were obtained from the project description.

4.11.5 LRDP Impacts and Mitigation Measures

LRDP Impact EN-1: **Construction and operation of campus development under the 2020 LRDP would increase the use of energy resources on the campus but would not result in wasteful, inefficient or unnecessary consumption of energy resources, nor would the increased energy use conflict with a state or local plan for renewable energy or energy efficiency.** ***(Less than Significant)***

Construction

During construction of campus facilities under the 2020 LRDP, energy would be consumed in the form of petroleum-based fuels used to operate off-road construction vehicles and equipment on the project site, construction worker vehicles traveling to and from construction sites, as well as delivery truck trips; and to operate generators to provide temporary power for lighting and equipment. The manufacture of construction materials used by development under the 2020 LRDP would also involve energy use. Due to the large number of materials and manufacturers involved in the production of construction materials (including manufacturers in other states and countries), upstream energy use cannot be reasonably estimated. However, it is reasonable to assume that manufacturers of building materials such as concrete, steel, etc., would employ all reasonable energy conservation practices in the interest of minimizing the cost of doing business. Furthermore, UC Merced has no control over or the ability to influence energy resource use by the manufacturers of construction materials. Therefore, this analysis does not evaluate upstream energy use.

Campus development under the 2020 LRDP would require site preparation; grading; pavement and asphalt installation; building construction; architectural coating; and landscaping and hardscaping. No demolition would be required. All construction would be typical for the region and building type. The total consumption of gasoline and diesel fuel during construction activities under the 2020 LRDP was estimated using the same assumptions and factors from CalEEMod that were used in estimating construction air emissions in **Section 4.1, Air Quality**. The estimated amounts of energy resources that would be consumed are presented in **Table 4.11-1, Construction Period Petroleum Fuel Consumption** below (see **Appendix 4.11** for detailed breakdown).

Table 4.11-1
Construction Period Petroleum Fuel Consumption

Diesel Fuel (in gallons)[a]	Gasoline (in gallons)
630,451	1,946,547

Source: CalEEMod Model Data; Impact Sciences 2019.

[a] *Includes consumption from off-road construction equipment, vendor trips, and hauling trips.*

[b] *Includes consumption from worker trips.*

[c] *Construction period is assumed to be 10 years (2021 to 2030)*

As shown in **Table 4.11-1**, above, off-road construction equipment, vendor trips, and hauling trips would consume approximately 0.63 million gallons of diesel over the entire 2020 LRDP construction period. Worker trips would consume about 1.9 million gallons of gasoline over the 2020 LRDP construction period. These amounts would be consumed over a period of 10 years and would represent a small percentage of the total energy used in the state. More importantly, for reasons presented below, this consumption would not represent a wasteful and inefficient use of energy resources.

There is growing recognition that sustainable construction is not any more expensive than "business as usual" construction methods, and further, that there are long-term significant cost-savings potential in utilizing green building practices and materials. In addition, development under the 2020 LRDP would feature a sustainable design to comply with CALGreen, which would also result in the use of sustainable materials and recycled content that would reduce energy consumption during construction. Construction materials would be products originating from nearby sources to the extent feasible in order to comply with CALGreen and to reduce costs of transporting construction materials long distances.

The project would also be required to comply with CARB's adopted Airborne Toxic Control Measure (ATCM) to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other toxic air contaminants. This measure prohibits diesel-fueled commercial vehicles greater than 10,000 pounds from idling for more than 5 minutes at any given time, and thereby helps avoid wasteful use of energy. Furthermore, contractors have a strong financial incentive to avoid wasteful, inefficient, and unnecessary consumption of energy during construction.

For the reasons listed above, construction activities under the 2020 LRDP, including the construction of small-scale projects, would not involve the inefficient, wasteful, and unnecessary use of energy during construction and the construction-phase impact related to energy consumption would be less than significant.

Operation

Campus operation under the 2020 LRDP would result in a net new demand of approximately 211 therms of natural gas per year and a net new electricity demand of 7.8 megawatts per year (MW/yr).

Title 24 represents the state policy on building energy efficiency. The goals of the Title 24 standards are to improve energy efficiency of residential and non-residential buildings, minimize impacts during peak energy-usage periods, and reduce impacts on state energy needs. UC Sustainable Practices Policy requires buildings to exceed Title 24 by 20 percent or meet energy performance targets. At UC Merced, a more ambitious goal of outperforming Title 24 energy efficiency standards by 30 percent has been set. Current campus buildings, which employ an array of design and technological strategies to minimize and manage campus energy consumption, are using approximately 50 percent less energy than Title 24 standards. The design of new buildings would follow appropriate building design requirements, such as passive solar design, and utilize energy-efficient methods and appliances, such as solar hot water systems and low-flow showerheads. In addition, all new buildings under the 2020 LRDP would incorporate energy conservation measures.

The University also requires all UC projects to achieve a minimum of a Silver rating under United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Building Design and Construction (BD+C) v4.0 Green Building Rating System (the LEED Rating System). The campus also has a 1.0 MW ground-mounted solar array and has installed roof-top solar panels on some of the residence halls on the campus to provide 4.2 MW of power. Another expansion of the ground-mounted solar array is planned. In compliance with UC Sustainable Practices Policy, 100 percent of the power that will be needed by the campus at buildout will be obtained from a number of renewable and alternative technologies, including wind turbines, fuel cells, and photovoltaic systems.

Thus, with compliance with Title 24 and consistency with the UC Sustainable Practices Policy, electricity and natural gas use on the campus would not be inefficient, wasteful, and unnecessary, nor would the increased energy use associated with the 2020 LRDP conflict with a state or local plan for renewable energy or energy efficiency. The impact would be less than significant.

With respect to small-scale projects that may be located within lands designated CMU, CBRSL or ROS, due to the location, small size, and nature of these projects, they would not increase demand for electricity or natural gas. To the extent a small project would increase demand, that increase in demand is accounted for in the analysis above. For the same reasons that are set forth above, the impact of small-scale projects on energy resources would be less than significant.

Petroleum-Based Fuel

Implementation of the 2020 LRDP would result in the consumption of petroleum-fuel related to vehicular travel (quantified as vehicle miles travelled (VMT)) to and from the project site. **Table 4.11-2, Estimated Petroleum-based Fuel Usage at Buildout**, below, presents the projected consumption of approximately 447,340 gallons of diesel and 785,340 gallons of gasoline per year, or a total of 1.23 million gallons of petroleum-based fuels per year based on an annual estimate of 17,516,332 VMT[4] obtained from the CalEEMod results for the proposed project.

This level of annual consumption is primarily based on fuel efficiency rates (miles per gallon) shown in **Table 4.11-2**. State laws and regulations will continue to require further improvements in fuel efficiency in motor vehicles produced and/or sold in California as well as a push towards more zero emissions vehicles (ZEV) in the California vehicle mix, and total annual consumption of petroleum-based fuel is expected to decrease over time.

Table 4.11-2
Estimated Petroleum-Based Fuel Usage at Buildout

Source	Fleet Mix [a]	Generation Factor [b, c]	Annual Consumption (in gallons)
Mobile			
Diesel (gallons)	16.6%	17,516,332/6.5 mpg	447,340
Gasoline (gallons)	83.4%	17,516,332/18.6 mpg	785,410
Total			1,232,750

Source: CalEEMod Model Data; Impact Sciences 2019.
mpg = miles per gallon
[a] *Data Source: FHWA OHPI, Highway Statistics, Fuel Consumption by State and Type http://www.fhwa.dot.gov/policyinformation/pubs/hf/pl11028/chapter5.cfm*
[b] *Data Source: California Department of Transportation, 2007 California Motor Vehicle Stock, Travel and Fuel Forecast, http://www.energy.ca.gov/2008publications/CALTRANS-1000-2008-036/CALTRANS-1000-2008-036.PDF*
[c] *Rentar Environmental Solutions, Inc. 2017. Here Are The Diesel Truck Miles Per Gallon (MPG). Available online at: https://rentar.com/diesel-truck-miles-per-gallon-mpg/, accessed August 22, 2018.*

California consumed a total of 15.1 billion gallons of gasoline and 1.6 billion gallons of diesel fuel in the year 2015 (CEC 2018b). As shown in **Table 4.11-2** above, additional automobile use under the 2020 LRDP would result in the consumption of approximately 785,340 gallons of gasoline and 447,340 gallons of diesel. This would represent approximately 0.005 percent of the statewide annual gasoline consumption and less than 0.028 percent of the statewide annual diesel consumption. As the question posed by the significance criteria is whether the use of this energy is inefficient or wasteful, it is notable that the GHG impact evaluation for the proposed project in **Section 4.3** shows that the per capita emissions under the

[4] CalEEMod default trip lengths were used, which is an average trip length of approximately 7.37 miles.

2020 LRDP from all energy use, including petroleum-based fuel use, will not exceed the threshold. Although the total emissions from all energy use would exceed the total emissions threshold, they would be reduced to a less than significant level with mitigation. As shown in in **Section 4.3,** the GHG emissions from development under the 2020 LRDP are driven by the use of energy in vehicles, with approximately 54 percent of emissions from petroleum-based fuel use. Since the GHG analysis concludes that with mitigation, the emissions will be below the established thresholds, it provides support to the conclusion that use of energy by the campus under the 2020 LRDP will not be wasteful or inefficient.

For the reasons listed above, campus development under the 2020 LRDP, including small-scale projects, would not involve the inefficient, wasteful, and unnecessary use of energy during operation nor would it conflict with a state or local plan for renewable energy or energy efficiency. The operation-phase energy impact would be less than significant.

Mitigation Measures: No mitigation is required.

4.11.6 Cumulative Impacts and Mitigation Measures

Cumulative Impact C-EN-1: Implementation of the 2020 LRDP would not contribute substantially to a cumulative impact on energy resources. ***(Less than Significant)***

LRDP Impact EN-1 above estimates and reports the potential increase in energy use that would result from campus development under the 2020 LRDP, both in terms of construction-phase energy use and operational energy use. The analysis above shows that although energy use would increase on the campus as a result of the construction of additional building space and increased campus population, the incremental energy use would not be wasteful or inefficient. Existing campus buildings are using approximately 50 percent less energy than Title 24 standards. At UC Merced, an ambitious goal of outperforming Title 24 energy efficiency standards by 30 percent has been set. All new buildings under the 2020 LRDP would incorporate energy conservation measures and design features to meet or exceed this goal. Similarly, UC Merced will increase the supply of on-campus student housing and continue to expand and improve its TDM program to minimize private automobile use and associated petroleum-based fuel use. Due to the policies and programs that would minimize energy use, the incremental demand that the campus would place on energy resources would not represent a substantial contribution to the cumulative demand for energy resources in the region. The impact would be less than significant.

Mitigation Measures: No mitigation is required.

4.11.7 References

California Energy Commission (CEC). 2016a. *Energy Almanac, Retail Fuel Report and Data for California*. Available online at: http://www.energy.ca.gov/almanac, accessed October 21, 2018.

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