3.7 ENERGY

3.7.1 Regulatory Setting

3.7.1.1 Public Utilities Code [California Public Utilities Commission (General Order 131-D)

Public electric utilities are regulated by the California Public Utilities Commission (CPUC). General Order 131-D sets forth provisions that must be adhered to when public electric utilities construct any new electric generating plant or modify an existing electric generating plant, substation, or electric transmission, power, or distribution line. A Permit to Construct must be obtained from CPUC, except when planned electrical facilities would be under 200 kilovolts (kV) and are part of a larger project that has undergone the adequate level of CEQA review and approval.

3.7.1.2 California Code of Regulations, Title 24, Part 6, and Part 11, Energy Efficiency Standards

Title 24, Part 6 of the California Code of Regulations, Energy Efficiency Standards, promotes efficient energy use in new buildings constructed in California. The standards regulate energy consumed for heating, cooling, ventilation, water heating, and lighting. Part 11 contains the mandatory green building standards for nonresidential buildings. The standards are enforced through the local building permit process.

3.7.1.3 Renewable Portfolio Standard Program (Senate Bill 1078)

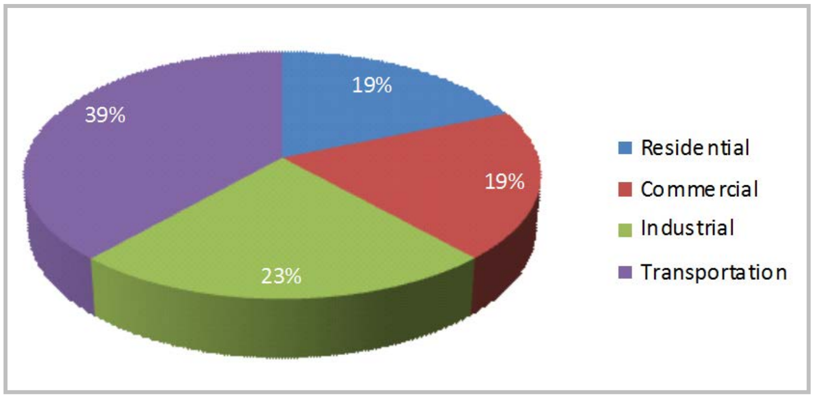
Requires retail sellers of electricity to increase their purchases of electricity generated by renewable sources and establishes a goal of having 20 percent of California's electricity generated by renewable sources by 2017. In 2010, the California Air Resources Board (CARB) extended this target for renewable energy resource use to 33 percent of total use by 2020 (CARB 2010). Increasing California's renewable supplies will diminish the State's heavy dependence on natural gas as a fuel for electric power generation.

3.7.2 Existing Conditions

Energy resources used for transportation include petroleum, natural gas, electricity, liquefied petroleum gas, hydrogen, and biofuels such as ethanol. California's gasoline and diesel markets are characterized by increasing demand, tight supply, and volatile prices. California imports more than 50 percent of its crude oil and over 15 percent of refined oil products, and the State's dependence on this increasingly expensive energy resource continues to grow. Moreover, fossil fuel-based transportation of products and people is a major contributor of carbon dioxide (CO_2), the principal catalyst to climate change. Changes in energy supply and demand are affected by factors such as energy prices, U.S. economic growth, advances in technologies, changes in weather patterns, and public policy decisions.

Energy consumption in California continues to be dominated by growth in passenger vehicles, and nearly 40 percent of all energy consumed in the State is used for transportation (Figure 3.7-1). California is the second largest consumer of transportation fuels in the world (behind the U.S. as a whole); more than 16 billion gallons of gasoline and 4 billion gallons of diesel fuels are consumed each year. California's population is estimated to exceed 44 million by 2020, which would result in substantial increases in transportation fuel demand for the State. Table 3.7-1 outlines the 149-million-barrel increase in

California's transportation fuel demand through 2020. California must address its petroleum infrastructure problems to secure transportation fuels to meet the needs of a growing population by adjusting choices of transportation, land use policies, and alternative fuels.



Source: U.S. Energy Information Administration, 2012

Figure 3.7-1. Estimated California Energy Consumption by Sector, 2010

Table 3.7-1. California Transportation Fuel Demand

Year	Barrels (millions/year)	Daily Energy Consumption (billions Btu)
2005	553	8,787
2010	617	9,804
2015	661	10,504
2020	702	11,155

Source: California Energy Commission, Integrated Energy Policy Report, 2007

Transportation energy consumption reflects the types and numbers of vehicles, the extent of their use (vehicle miles traveled [VMT]), and their fuel economy (miles per gallon). Implementing the project Build Alternative is expected to change the dynamics of all vehicle classes with regard to VMT. Changes in VMT, in turn, would affect energy consumption. VMT is also important in determining the demand for infrastructure improvements. Urban growth patterns have resulted in an annual increase of over 3 percent in California's VMT between 1975 and 2004. In 2005, Southern California Association of Governments (SCAG) data showed automobile VMT in California at 372 million, which is equivalent to 2.14 trillion Btu or 368,966 barrels of oil.

SCAG estimates the VMT for transportation plans. Projections show a 29 percent increase in VMT from 2008 to 2035. VMT is directly related to energy use and is the main contributor to air quality pollutants in the SCAG region. A reduction in VMT through alternative modes of transportation would lower energy needs and reduce pollutant emissions.

Table 3.7-2 displays the energy requirements for various modes of transportation, including automobile, bus, and rail transit, as provided by the Oak Ridge National Laboratory, which has set only one level of energy intensity for transit buses regardless of the fuel type (e.g., compressed natural gas or diesel). Urban rail projects (such as the Metro Gold Line Foothill Extension) have a lower Btu per passenger-mile rate compared to automobiles and buses.

Table 3.7-2. Transportation Energy Intensity

Transport Mode	Btu/Passenger-Mile	Btu/Vehicle-Mile
Automobile[1]	3,514	5,517
Transit Bus (all vehicle types)[1]	4,315	39,048
Commuter Rail[1]	2,638	90,328
Light Rail—Los Angeles[2]	2,621	NA

Sources:
[1] Oak Ridge National Laboratory, Transportation Energy Data Book: Edition 29, 2010
[2] US Department of Energy—Vehicles Technology Program (http://www1.eere.energy.gov/vehiclesandfuels/facts/favorites/fcvt_fotw221.html)

Table 3.7-3 shows the energy usage associated with transportation within the SCAG region, as well as regional VMT and VMT per Btu. In 2008, motor vehicle energy used is approximately 950 trillion Btu and this use could approach 1,383 trillion Btu by 2035.

Table 3.7-3. Annual Motor Vehicle Energy Usage within the SCAG Region

Scenario	Billion Btu	VMT	VMT per Btu
2008 Existing	949,680	429,178,401	452
2035 Future No Project	1,383,126	551,600,000	399

Source: Southern California Association of Governments, Draft 2008 Regional Transportation Plan Program Environmental Impact Report, January 2008

Table 3.7-4 shows the regional energy consumption by existing Metro facilities. Metro's energy usage has been steadily increasing as the Metro regional transit system has continued to expand.

Table 3.7-4. Metro Facilities Regional Energy Consumption

Daily Energy Consumption (kWh)	Daily Energy Consumption (Btu)
189,041	645,008,219

Source: Metro Baseline Sustainability Report, 2009

3.7.3 Environmental Impacts

3.7.3.1 Evaluation Methodology

The project's energy needs are measured in petroleum and equivalent British thermal units (Btu), which is the quantity of heat required to raise the temperature of water 1 degree Fahrenheit at sea level. Other units of energy can all be converted into equivalent Btu. Therefore, Btu are used as the basis for comparing energy consumption associated with different resources.

Table 3.7-5 shows comparisons of various types of energy and their equivalent Btu.

Table 3.7-5. Energy Comparisons

Energy Type	Energy Unit	Equivalent Btu
Electricity	kilowatt-hour (kWh)	3,412
Natural Gas	cubic foot	1,034
Crude Oil	barrel (42 gallons)	5,800,000
Gasoline	gallon	125,000

Source: California Energy Commission, 2009

3.7.3.2 Impact Criteria

Energy impacts are considered significant if the project would:

- Result in wasteful, inefficient, or unnecessary use of energy, and/or
- Substantially increase energy demand.

3.7.4 Environmental Impacts

3.7.4.1 Short-Term Construction Impacts

No Build Alternative

The No Build Alternative would not involve construction. Therefore, no impacts are expected.

Transportation Systems Management (TSM) Alternative

The TSM Alternative would not involve construction. Therefore, no impacts are expected.

Build Alternative

Table 3.7-6 presents the total energy estimates for construction of the project. The construction energy analysis is based on the track miles (both at grade and elevated) of the project.

Table 3.7-6. Total Construction Energy Consumption—Build Alternative

	Energy Consumption (mBtu)
At-grade track	401,996
Elevated track	21,443
Total	**423,439**

Source: Parsons Brinckerhoff, 2011

3.7.4.2 Long-Term Impacts

No Build Alternative

Anticipated energy use (in terms of mBtu) for the roadways for the year 2035 is presented in Table 3.7-7. As shown, the No Build Alternative project would have no impact on energy usage, as it would not affect VMT or involve the operation of new facilities.

Transportation Systems Management (TSM) Alternative

As shown in Table 3.7-7, the TSM Alternative is predicted to slightly decrease energy usage, as compared to No Build, though the difference would be very small. As the TSM Alternative project would slightly decrease energy usage, no adverse impact would result.

Build Alternative

Table 3.7-7 presents anticipated daily project energy use in terms of mBtu for the roadways and rail system for the year 2035. As shown, the Build Alternative project is predicted to slightly decrease energy usage, as compared to the No Build Alternative, although the difference would be very small. Since the project would slightly decrease energy usage, no adverse impact would result.

Table 3.7-7. Daily Project Energy Use (mBtu)

Alternative	Roadways	Rail	Stations	Total	% Change from No Build
No Build	4,793,284	—	—	4,793,284	—
TSM	4,789,839	—	—	4,789,839	-0.1%
Build	4,786,457	681	3	4,787,141	-0.1%

Source: Parsons Brinckerhoff, 2011

3.7.5 Cumulative Impacts

When considering the combined effect of reduced roadway VMT and increased power usage for the rail system, the Build Alternative shows a reduction in energy consumption, although the reduction is extremely small. As such, this project is consistent with the energy conservation goals and is not expected to have a cumulative adverse impact on the environment.

3.7.6 Mitigation Measures

3.7.6.1 Short-Term Construction Mitigation Measures

Construction would result in the one-time expenditure of energy during construction operations. Construction mitigation measures include the use of newer, more energy-efficient equipment and the minimization of idle times of construction equipment. These measures, many of which are in Metro's Green Construction Policy, include:

- **CON-9**—Contractors shall maintain equipment and vehicle engines in good condition and in proper tune per manufacturers' specifications.
- **CON-10**—Heavy-duty trucks shall be prohibited from idling in excess of five minutes, both on- and off-site.
- **CON-11**—Construction parking shall be configured to minimize traffic interference.
- **CON-12**—Construction activity that affects traffic flow on the arterial system shall be limited to off-peak hours.
- **CON-13**—Construction staging and vehicle parking, including workers' vehicles, shall be prohibited on streets adjacent to sensitive receptors such as schools, daycare centers, senior facilities, and hospitals.

- **CON-14**—Portable generators shall be low-emitting and use ultra low sulfur diesel (<15 parts per million) or gasoline.
- **CON-15**—Construction equipment shall use a combination of low sulfur diesel (<15 parts per million) and exhaust emission controls.
- **CON-16**—The construction process shall use equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for the intended job).
- **CON-17—**Contractors shall be prohibited from tampering with construction equipment to increase horsepower or defeat emission control devices.
- **CON-18**—The Construction Authority shall designate a person to ensure the implementation of air quality mitigation measure through direct inspections, records reviews, and complaint investigations.
- **CON-19**—LED lighting shall be used for construction activities taking place at night, to the extent feasible.

3.7.6.2 Long-Term Mitigation Measures

Since the project operations would result in slightly decreasing energy use, there would be no adverse long-term impact and no mitigation is required.

3.7.7 Level of Impact After Mitigation

With implementation of mitigation measures, the project would not result in wasteful, inefficient, or unnecessary use of energy or in a substantial increase energy demand during construction; impact would be less than significant.

No adverse energy impacts are expected with the operational phase of the project; the project would slightly decrease the use of energy in the long term and thus, would not result in wasteful, inefficient, or unnecessary use of energy or in a substantial increase energy demand.