

3.12 ENERGY RESOURCES

This section of the Draft EIR provides an analysis of the potential impacts on energy resources. The analysis focuses on transportation fuels and electricity related to powering light rail. Refer to Section 3.11, Utilities, for analysis of natural gas and electricity facilities and 3.5, Greenhouse Gas Emissions for energy's effect on greenhouse gases (GHG).

3.12-1 Regulatory Framework

Federal, state, regional and local regulations concerning energy resources management are described in the following section.

3.12-1.1 Federal Regulations

The Energy Policy and Conservation Act of 1975

The Energy Policy and Conservation Act of 1975 was enacted to serve the nation's energy demands and promoting conservation methods. The Act mandated vehicle economy standards, extended oil price controls to 1979, and directed the creation of a strategic petroleum reserve. Part A of Title III of the Act established the Corporate Average Fuel Economy (CAFE) standards for automobiles, and automobiles were required to be labeled with their fuel economies, estimated fuel costs, and fuel economy comparisons to other comparable vehicle models. Part B of Title III of the Act established the Energy Conservation Program, which authorizes the Department of Energy to develop, revise, and implement minimum energy conservation standards for residential, commercial and industrial, lighting, and plumbing appliances and equipment.

Alternative Motor Fuels Act of 1988

The Alternative Motor Fuels Act amended a portion of the Energy Policy and Conservation Act to encourage the use of alternative fuels, including electricity. The Act directed the Secretary of Energy to ensure that the maximum practicable number of federal passenger automobiles and light duty trucks be alcohol-powered vehicles, dual energy vehicles, natural gas-powered vehicles or natural gas dual energy vehicles. The Act also directed the Secretary of Energy to conduct a study regarding such vehicles' performance, fuel economy, safety, and maintenance costs and report to Congress the results of a feasibility study concerning the disposal of such alternative-fueled federal vehicles.

Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 and Congestion Mitigation and Air Quality (CMAQ) Improvement Program

The ISTEA was the first federal legislation regarding transportation planning and policy. This Act presented an intermodal approach to highway and transit funding with collaborative planning requirements, giving additional powers to state and local transportation decision-makers and metropolitan planning organizations. This Act also provided funds for non-motorized commuter trails, defined a number of High Priority Corridors to be part of the National Highway System, and called for the designation of up to five high-speed rail corridors.

The CMAQ Program was created under ISTEA. The program was reauthorized under the Transportation Equity Act for the 21st Century (TEA-21) in 1998 and again as part of the Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users in 2005. The purpose of the CMAQ Program is to fund transportation projects or programs and related efforts that contribute to air quality improvements and provide congestion relief.

Transportation Equity Act for the 21st Century (TEA-21)

The TEA-21 was enacted in 1998 as the successor legislation to ISTEA and builds on its established initiatives. This Act reauthorized the CMAQ Program and authorized federal highway, highway safety, transit and other surface transportation programs over the next six years. It combined the continuation and improvement of current programs with new initiatives to meet the challenges of improving traffic safety, protecting and enhancing communities and the natural environment as transportation is provided, and advancing economic growth and competitiveness domestically and internationally through efficient and flexible transportation.

Moving Ahead for Progress in the 21st Century Act (MAP-21)

Signed by President Obama in July 2012, MAP-21 represented the first multi-year transportation authorization enacted since 2005, funding surface transportation programs with more than \$105 billion for fiscal years 2013 and 2014. Among the provisions within MAP-21 that relate to energy is the scope of the state and metropolitan planning processes, which aim to “protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.” MAP-21 also authorized \$70 million for a public transportation research program that focuses on energy efficiency and system capacity, among other items.

The funding mechanisms of MAP-21 were subsequently extended through the codification of several additional pieces of federal legislation:

- > Highway and Transportation Funding Act of 2014 (Public Law 113-159): Extended surface transportation funding authorities through May 31, 2015, that would have otherwise expired after September 30, 2014;
- > Highway and Transportation Funding Act of 2015 (Public Law 114-21): Extended surface transportation funding authorities through July 31, 2015, that would have otherwise expired after September 30, 2014;
- > Surface Transportation and Veterans Health Care Choice Improvement Act of 2015 (Public Law 114-41): Extended surface transportation funding authorities through October 29, 2015, that would have otherwise expired after September 30, 2014;
- > Surface Transportation Extension Act of 2015 (Public Law 114-73): Extended surface transportation funding authorities through November 20, 2015, that would have otherwise expired after September 30, 2014;
- > Surface Transportation Extension Act of 2015, Part II (Public Law 114-73): Extended surface transportation funding authorities through December 4, 2015, that would have otherwise expired after September 30, 2014;

With the exception of the provisions of MAP-21, there is no other federal legislation related specifically to the subject of energy efficiency in public transportation project development and operation.

Energy Policy Act of 1992

The Energy Policy Act of 1992 reduces dependence on imported petroleum and improves air quality by addressing all aspects of energy supply and demand, including alternative fuels, renewable energy and energy efficiency. This Act encourages the use of alternative fuels through both regulatory and voluntary activities and through the approaches carried out by the U.S. Department of Energy. It requires federal,

state, and alternative fuel provider fleets to acquire alternative fuel vehicles. The U.S. Department of Energy's Clean Cities Initiative was established in response to the Energy Policy Act of 1992 to implement voluntary alternative fuel vehicle deployment activities.

Energy Policy Act of 2005

The Energy Policy Act necessitates the development of grant programs, demonstration and testing initiatives, and tax incentives that promote alternative fuels and advanced vehicles production and use. This Act also amends existing regulations, including fuel economy testing procedures and Energy Policy Act of 1992 requirements for federal, state, and alternative fuel provider fleets. The Energy Policy Act of 2005 addresses energy production in the United States, including: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Tribal energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

Energy Independence and Security Act of 2007

The Energy Independence and Security Act consists of provisions designed to increase energy efficiency and the availability of renewable energy. Key provisions of this Act include:

- > The CAFE, which sets a target of 54.5 miles per gallon for the combined fleet of cars and light trucks by model year 2025.
- > The Renewable Fuels Standard, which sets a modified standard that starts at 9.0 billion gallons in 2008 and rises to 36 billion gallons by 2022.
- > The Energy Efficiency Equipment Standards, which includes a variety of new standards for lighting and for residential and commercial appliance equipment.
- > The Repeal of Oil and Gas Tax Incentives, which includes repeal of two tax subsidies in order to offset the estimated cost to implement the CAFE provision.

Executive Order (EO) 13123

Issued June 3, 1999, EO 13123 established goals for energy efficiency improvements. EO 13123 calls for Federal agencies to improve the energy efficiency of their buildings, promote the use of renewable energy, and reduce GHG emissions associated with energy use in their buildings, among other energy related requirements. It calls for each Federal agency to reduce its GHG emissions attributed to facility energy use by 30% by 2010 compared to 1990 emissions levels and to expand the use of renewable energy within Federal facilities, including 20,000 solar energy systems at Federal facilities by 2010.

Executive Order (EO) 14057

Issued by President Biden December 8, 2021, EO 14057 established a policy for the federal government to achieve a carbon pollution-free electricity sector by 2035 and net-zero emissions by no later than 2050, through a “whole-of-government approach.”

3.12-1.2 State and Regional Regulations

California Energy Commission (CEC)

The CEC is the state's primary energy policy and planning agency. Created by legislation in 1974, the CEC has seven major responsibilities: (1) advancing state energy policy, (2) achieving energy efficiency, (3) investing in energy innovation, (4) developing renewable energy, (5) transforming transportation, (6)

overseeing energy infrastructure, and (7) preparing for energy emergencies. SB 1389 (Chapter 568, Statutes of 2002) requires the CEC to prepare a biennial integrated energy policy report assessing major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors. The report also provides policy recommendations to conserve resources, protect the environment, and ensure reliable, secure and diverse energy supplies.

California Transportation Plan (CTP)

The CTP is a statewide, long-range transportation plan to meet future mobility needs. The CTP defines performance-based goals, policies, and strategies to comply with MAP-21 and to achieve an integrated, multimodal transportation system. The CTP is prepared in response to federal and state requirements and is updated every five years. The CTP addresses how the state will achieve maximum feasible emissions reductions, taking into consideration the use of alternative fuels, new vehicle technology and tailpipe emissions reductions. Caltrans must consult and coordinate with related state agencies, air quality management districts, public transit operators and regional transportation planning agencies. Caltrans must also provide an opportunity for general public input and submit a final draft of the CTP to the legislature and governor.

California Code of Regulations (CCR), Title 13

Sections 1956.1, 2020, 2023, 2023.1, and 2023.4 of Title 13 of the CCR include vehicle requirements for public transit agencies. The Fleet Rule for Transit Agencies includes stringent exhaust emission standards for new Urban Bus engines and vehicles. The regulation also promotes advanced technologies by providing for zero-emission bus demonstration projects and requiring zero emission bus acquisitions applicable to larger transit agencies.

California Code of Regulations (CCR), Energy Efficiency Standards

Energy consumption of new buildings in California is regulated by State Building Energy Efficiency Standards contained in the CCR, Title 24, Part 6, Chapter 2-53. Title 24 applies to all new construction of both residential and nonresidential buildings, and regulates energy consumed for heating, cooling, ventilation, water heating, and lighting.

California Green Building Standards Code (CALGreen)

In 2007, the California Building Standards Commission adopted the statewide mandatory CALGreen Part 11 of Title 24, California Code of Regulations. The Code was updated in 2010, 2013, 2016 2019 and 2022 to require additional energy savings. CALGreen applies to the planning, design, operation, construction, use and occupancy of every newly constructed building or structure. CALGreen includes both Mandatory, and Voluntary measures; MBS established CALGreen Tier 2 as the standard for all its capital projects 10,000 SF or greater. CALGreen Tier 2 includes required Mandatory, Prerequisite and Elective reach code measures.

CALGreen – Tier 2 requires the following applicable project design features:

1. CALGreen Tier 2 – Prerequisite Requirements

- > To achieve CALGreen Tier 2 status, the Designer/Contractor shall meet the CALGreen Prerequisites. See A5.602.2 CALGreen Verification Guidelines and Tier 2 Checklist:
 - Stations to comply with **CALGreen Tier 2** (CCR, Title 24, Part 11, California Green Building Standards Code (CALGreen) Tier 2.

- Each station to be designed and constructed to comply with **CALGreen Tier 2 Prerequisite for Cool Roof**, Section A5.106.11.2.
 - Each station to be designed and constructed to be **“Solar Ready”**¹ California Energy Code, CCR, Title 24, Part 6, Section 110.10 - Solar Readiness.
 - Each station to be designed and constructed to be comply with **CALGreen Tier 2 Prerequisite for Outdoor Lighting**, Energy Performance of Outdoor lighting power 90% of Part 6, Section A5.203.1.1.1.
 - Project to comply with **CALGreen Tier 2 Prerequisite for Construction and Demolition Waste reduction of 80-percent** of construction and demolition waste in Section A5.408.3.1.
 - Project to comply with **CALGreen Tier 2 Prerequisite for Recycled Content** of 15 percent of materials based on estimated total cost or use two products from Table A5.405.4 for at least 75 percent by cost in Section A5.405.4.1.
 - 2022 California Green Building Standards Code (CALGreen) Tier 2, California Building Standards Commission (Nonresidential), California Code of Regulations (CCR), Title 24, Part 11, (or current version at 100% design).
- > CALGreen Tier 2 – Elective Requirements
- In addition to complying with applicable Mandatory measures in CALGreen Chapter 5 for nonresidential structures and buildings, and CALGreen Tier 2 Prerequisite measures, the project design and construction shall select additional Elective measures from Appendix A5 Nonresidential Voluntary Measures as described in A5.602.2 CALGreen Verification Guidelines Tier 2 Checklist, based on project design.

2. CALGreen - Documentation Author's / Responsible Designer's Declaration Statement and Compliance Verification Checklist.

- > All occupied structures less than 10,000 square feet, the Designer/Contractor shall provide as part of each design package submittal a completed A5.602 CALGreen Mandatory CALGreen verification checklist, with signed Documentation Author's / Responsible Declaration Statement.
- > All occupied structures greater than 10,000 square feet, the Designer/Contractor shall provide as part of each design package submittal a completed A5.602.2 CALGreen Tier 2 verification checklist with signed Documentation Author's / Responsible Declaration Statement.
- > The Designer shall sign the Documentation Author's / Responsible Designer's Declaration Statement and provide completed verification checklist within the design and construction plans.
- > The Designer's Declaration Statement, attests to the accuracy and completeness of the CALGreen Checklist, and projects meeting either Mandatory or CALGreen Tier 2 design compliance, based on structure size requirement.

Assembly Bill (AB) 118

AB 118 created the Alternative and Renewable Fuel and Vehicle Technology Program, to be administered by the CEC. This Program authorizes the CEC to award grants, revolving loans, loan guarantees and other appropriate measures to qualified entities to develop and deploy innovative fuel and vehicle technologies that will help achieve California's petroleum reduction, air quality and climate change goals, without adopting or advocating any one preferred fuel or technology. In addition to funding alternative fuel and vehicle projects, this Program also funds workforce training to prepare the workforce required to design, construct, install, operate, produce, service and maintain new fuel vehicles. The statute was amended in 2008 and 2013, which authorized the CEC to develop and deploy alternative and renewable fuels and advanced transportation technologies to help attain the state's climate change policies.

Assembly Bill (AB) 2076

The CEC and the CARB are directed by AB 2076, Reducing Dependence on Petroleum (passed in 2000) to develop and adopt recommendations for reducing dependence on petroleum. A performance-based goal is to reduce petroleum demand to 15% less than 2003 demand by 2020.

Assembly Bill (AB) 1493

AB 1493 amended the Clean Car Standards (Chapter 200, Statutes of 2002) that require reductions in GHG emissions in new passenger vehicles from 2009 through 2016. The Advanced Clean Cars program extends AB 1493 for model years 2017 to 2025 and the Advanced Clean Cars II Program covers model years 2026 through 2035. This program promotes clean fuel technologies (i.e., plug-in hybrids, battery electric vehicles, compressed natural gas vehicles, hydrogen powered vehicles), reduces smog, and provides fuel saving costs.

Senate Bill (SB) 1389, Chapter 568, Statutes of 2002

The CEC is responsible for forecasting future energy needs for the state and developing renewable energy resources and alternative renewable energy technologies for buildings, industry, and transportation. SB 1389 requires the CEC to prepare a biennial integrated energy policy report assessing major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors. The report is also intended to provide policy recommendations to conserve resources, protect the environment, and ensure reliable, secure, and diverse energy supplies. The 2021 Integrated Energy Policy Report (IEPR) is the most recent iteration published under SB 1389, and it focused on four primary components of forecasting the state's energy future (CEC, 2022b): building decarbonization, energy reliability, decarbonizing the state's natural gas system, and preparing the California energy demand forecast.

The 2021 IEPR outlined key findings and recommendations related to each topic that would help facilitate the state's transition to carbon-free technologies. The mid-case electricity forecast projects electricity sales to reach almost 280,000 gigawatt-hours (GWh) by 2035 (an annual growth rate of approximately 0.7%) and projects transportation electrification to reach 35,000 GWh by 2035 (representing approximately 12% of total load). The managed peak forecast for the California Independent System Operators grows at a rate of approximately 0.9% annually and is anticipated to be 52,400 megawatts (MW) by 2035.

Senate Bill (SB) 743

SB 743 encourages land use and transportation planning decisions and investments to reduce vehicle miles traveled (VMT) that contribute to GHG emissions. Pursuant to SB 743, the Office of Planning and Research adopted CEQA Guidelines, section 15064.3, which establishes that, generally, VMT shall be used to measure the significance of transportation impacts in CEQA documents.

California's Renewables Portfolio Standard (SBs 1078/107/X 1-2/100)

SBs 1078 and 107, California's Renewables Portfolio Standard (RPS), obligated investor-owned energy service providers and Community Choice Aggregations to procure an additional one percent of retail sales per year from eligible renewable sources until 20% was reached (by 2010). The California Public Utilities Commission (CPUC) and CEC are jointly responsible for implementing the program.

SB X 1-2, called the California Renewable Energy Resources Act, obligated all California electricity providers to obtain at least 33% of their energy from renewable resources by 2020. SB 350 requires retail seller and publicly owned utilities to procure 50% of their electricity from eligible renewable energy resources by 2030.

SB 100—The 100 Percent Clean Energy Act of 2018 (2018)—updates the state's RPS to ensure that by 2030 at least 60% of statewide electricity is renewably sourced, and set a goal of powering all retail electricity sold in the state and supporting state agency electricity needs with renewable and zero-carbon resources by 2045. SB 100 also requires annual Joint Agency Reports to be prepared to track progress on expanding the availability of renewable resources and to assess the potential of emerging technologies in aiding the State's efforts to reduce GHG emissions from the energy sector. The first Joint Agency Report was published in 2021 and determined that approximately 63% of California's electricity retail sales in 2019 came from non-fossil fuel sources thanks to a combination of renewables, hydroelectric, and nuclear generation

California Energy Management Executive Orders

The California Governor's Office has issued a series of EO's related to energy resources management and the expansion of statewide renewable energy infrastructure. Table 3.12-1 summarizes the most directly applicable EOs that involve or address the generation and distribution of energy throughout California.

Table 3.12-1. California Energy Management Executive Orders

Executive Order	Date	Summary
S-01-07	January 2007	Established a Low-Carbon Fuel Standard and directed the Secretary of the Cal/EPA to develop and propose protocols for measuring the life-cycle carbon intensity of transportation fuels.
S-13-08	November 2008	Directed state agencies to complete analysis of the effects of sea level rise in California, prepared in the California Sea Level Rise Assessment Report through coordination with the National Academy of Sciences.
S-14-08	November 2008	Established renewable energy generation share target for retail sellers of electricity of 33% renewably sourced by 2020.
B-16-12	March 2012	Directed state agencies to encourage the commercialization of zero emission vehicles (ZEVs), set goal of one million ZEVs in use statewide by 2020.
B-30-15	April 2015	Established a mid-term goal for 2030 of reducing GHG emissions by 40% below 1990 levels and required CARB to update its current AB 32 Scoping Plan to identify the measures to meet the 2030 target.
B-55-18	September 2018	Established a goal to achieve statewide carbon neutrality by 2045.
N-79-20	September 2020	Established a target to make all vehicles in the state emission free: cars and passenger trucks by 2035, medium and heavy duty trucks by 2045.

Southern California Association of Governments (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)

With more than 19 million people as of 2019, the SCAG region is the second-most populated metropolitan area in the United States. Growth in population is expected to result in greater demands on the region’s transportation system. State and federal mandates require SCAG to prepare a regional transportation plan every four years. The Connect SoCal 2020-2045 RTP/SCS provides a long-range vision for regional transportation goals and policies and predicts transportation challenges and the region’s future transportation strategy. Connect SoCal establishes the following strategies relevant to the Proposed Project:

- > Preserving and optimizing our current and future transportation system.
- > Capital improvements of multiple transportation modes to create a complete mobility system.

As part of the 2020-2045 RTP/SCS, SCAG continues to work towards reducing regional energy use and consumption. Strategies to implement this include, but are not limited to, working with local jurisdictions and energy providers, through its Energy and Environment Committee, and administration of the Clean Cities program, Sustainability Planning grants program, and other SCAG energy-related planning activities, to encourage energy efficient building development. Additional measures include, pursuing partnerships with SCE, municipal utilities, and the CPUC to promote energy efficient development in the SCAG region, through coordinated planning, data and information sharing activities.

Metro Energy and Sustainability Policy

Metro spends approximately \$30 million per year on utility costs for electricity, gas, and water alone, with \$26 million of those costs being just for electricity. Metro also expects that these costs will rise in future years, and thus is committed to embracing sustainability, energy efficiency, conservation, and renewable energy sources as a primary pathway towards reducing Metro's energy costs. In June 2007, the Board adopted the Energy and Sustainability Policy to control energy consumption and embrace energy efficiency, energy conservation, and sustainability.

The purpose of the Energy and Sustainability Policy is to control energy consumption and embrace energy efficiency, energy conservation, and sustainability to:

- > Avoid unnecessary expenditure; help in protecting the environment; improve cost effectiveness, productivity, and working conditions; prolong the useful life of fossil fuels by using resources more efficiently.
- > Gain more control over our energy consumption by aggressively pursuing renewable energy sources, take advantages of rebates and subsidies for energy and water conservation wherever feasible, conduct energy audits of Metro divisions and facilities, and implement energy conservation measures where they are feasible and fiscally prudent.

Metro's immediate objectives are to:

- > Gain more control over our energy consumption by aggressively pursuing renewable energy sources, take advantages of rebates and subsidies for energy and water conservation wherever feasible, conduct energy audits of Metro divisions and facilities, and implement energy conservation measures where they are feasible and fiscally prudent.
- > Construct all new facilities and projects, including new transit corridor projects, using energy efficiency and conservation strategies. For buildings or structures over 10,000 square feet, projects must be constructed to achieve leadership in Energy and Environmental Design Silver certification, at minimum.

Metro's long term objectives are to:

- > Reduce, whenever possible, Metro's use of fossil fuels through the use of ambient and renewable energy sources.
- > Buy fuels and electricity at the most economic cost.
- > Use fuels and electricity as efficiently as possible.
- > Reduce the amount of emissions, especially carbon dioxide (CO₂), caused by our required consumption

Metro Sustainability Implementation Plan (MSIP)

The Sustainability and Energy Policy adopted in June 2007 was an attempt to capture the essence of sustainability, as the term applies to the planning, construction, operations, and procurement practices. The creation of the Ad-Hoc Sustainability and Climate Change Committee in July 2007 provided the basis to develop an agency-wide plan of sustainability implementation. Since September 2007, staff have reported accomplishments to the Ad-Hoc Sustainability and Climate Change Committee and have coordinated efforts with the Clean Air Task Force. The Sustainability Mission and Vision Statements were

adopted by members of the Ad-Hoc Sustainability and Climate Change Committee at the January 2008 meeting.

The purpose of MSIP is to demonstrate to employees, stakeholders, customers and the general public, our continuing commitment to sustainability through fiscal responsibility, social equity and environmental stewardship. Similar to other transportation plans, the MSIP has a short-term and a long-term set of actions. The short-term plan identifies four specific projects for continued implementation or commencement: Metro and Countywide GHG Emissions Management, Energy Sustainability Initiatives, Development of Sustainability Design Guidelines, and Development and Implementation of Sustainable and Environmental Management Systems.

Metro Construction and Demolition Debris Recycling and Reuse Policy

The Construction and Demolition Debris Recycling and Reuse Policy was adopted in December 2007 and required Metro to give preference to recycled and recyclable products in selecting construction materials to the maximum extent feasible. It stated that Metro would use landfills and recycling facilities that maintain documentation that indicated their legitimacy for disposal or diversion.

Metro Green Construction Policy

The development and implementation of a Green Construction Policy was approved by the Metro Board on December 9, 2010. Under the Policy, Metro will only use greener, less polluting construction equipment and vehicles; and implement best practices to meet or exceed air quality emission standards in all construction projects performed on Metro properties and rights-of-way. Phase the implementation of this policy, through a collaborative process, for implementation by other jurisdictions that receive/program Metro funding (in whole or in part) for construction projects. The Policy provides requirements for 1) identifying and mitigating air emission impacts on human health, environment, and climate of on-road and off-road construction equipment and generators used in our construction and development activities; 2) implementing appropriate Best Management Practices (BMP) to complement equipment mitigations; and 3) implementing strategies to ensure compliance with this policy.

Off-road construction equipment shall incorporate, where feasible, emissions-reducing technology such as hybrid drives and specific fuel economy standards; must restrict engine idling to a maximum of 5 minutes; all off-road diesel-powered construction equipment greater than 50 horsepower (hp) shall meet Tier-4 off-road emission standards at a minimum; all construction equipment shall be outfitted with Best Available Control Technology devices certified by California Air Resources Board (CARB); and any emissions control device used by the Contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similarly sized engine as defined by CARB regulations.

On-road construction equipment hauling material must be fully covered while operating at, to and from the construction site; must restrict engine idling to a maximum of 5 minutes; and all heavy-duty diesel trucks or equipment with a gross vehicle weight rating of 19,500 pounds or greater shall comply with U.S. Environmental Protection Agency (USEPA) 2007 on-road emission standards for PM and NO_x (0.01 grams per brake hp-hour and at least 1.2 grams per brake hp-hour, respectively).

In addition to equipment requirements, BMP intended to reduce emissions and energy consumption during construction are imposed on all construction projects that performed on Metro properties and rights-of-way.

Metro Energy Conservation and Management Plan (ECMP)

In recent years, Metro has implemented several policies and plans to enhance energy efficiency throughout its system. In 2011, Metro published its ECMP to serve as a strategic blueprint for proactively guiding energy use in a sustainable, cost-effective, and efficient manner. The ECMP complements Metro's 2007 Energy and Sustainability Policy, focusing on electricity for rail vehicle propulsion, electricity for rail and bus facility purposes, natural gas for rail and bus facility purposes, and the application of renewable energy. The ECMP addresses current and projected energy needs based on 2010 utility data and existing agency plans to meet increasing ridership through system expansion and new facility construction incorporating Measure R initiatives.

The ECMP examines both supply and demand aspects of energy consumption and analyzes energy use profiles and the various procurement options in terms of rate structures and supply contracts available to the agency. It also identifies opportunities to reduce energy consumption and realize cost savings through the implementation of low-cost operational initiatives and cost-effective capital retrofits. The ECMP includes an evaluation of an optimal organizational structure for its implementation and provides recommended strategies for achieving the objectives set forth. The ECMP strategies follow a process of Plan-Do-Check-Act by establishing the Energy Management Action Plan (EMAP), implementing the EMAP, conducting annual reviews, and adjusting or modifying the EMAP based on gathered feedback and documented performance. In the short term, the ECMP called for expansion of utility data collection and sub-metering of buildings and propulsion injection points to enhance the accuracy of system analyses and identify primary opportunities for improvements.

Following publication of the ECMP, Metro began preparing annual Energy and Resource Reports to provide evaluations on the effectiveness of ECMP strategies. The 2019 Energy and Resource Reports, which analyzes the sustainability and environmental performance of Metro operational activities during the 2018 calendar year, showed Metro reduced total energy consumption by 7.9% compared to 2017 as a result of reduced vehicle fuel consumption by buses and support vehicles. In 2018, 31% of Metro's electricity came from renewable energy sources, including its own solar photovoltaic (PV) systems. These strategies actively reduce GHG emissions, 95% of which are derived from energy use. Per Metro's 2022 American Public Transportation Association Sustainability Performance Report, in 2021 Metro reduced its energy consumption by 0.4% compared to 2020. Onsite renewable energy capacity went unchanged in 2019 or 2020, and remains at. However, we expect this number to increase by 2023, at which point multiple new solar PV installations are expected to be installed and come online (Metro, 2022). Metro is increasing its focus on energy efficiency in buildings as operations grow to meet the demands of a larger transit system. Integrated lighting controls, advanced energy management systems and reliance on renewable energy are included in design requirements to ensure new facilities will be equipped with efficient and effective technologies. Additionally, Metro has recently committed to electrifying its directly-operated bus fleet by 2030.

Metro's Sustainable Rail Plan

The Sustainable Rail Plan (Metro, 2013) supports the implementation of the ECMP by identifying strategies that directly reduce energy used by rail operations, auxiliary systems, propulsion, and facilities. Specifically, the plan provides detailed recommendations that apply to the ECMP sections regarding key equipment upgrades and powerful sustainability and investment-grade opportunities to explore. While the ECMP addresses Metro's broader energy use and procurement strategy, this plan specifically addresses the rail system and analyzes in detail the energy efficiency opportunities within Metro's rail equipment and operations.

Metro's Climate Action and Adaptation Plan

To advance its goals of creating a climate-resilient organization and transit system equipped to meet future regional needs, Metro published a Climate Action and Adaptation Plan (CAAP) (Metro, 2019b) that outlined a path to achieving net zero systemwide greenhouse gas emissions by 2050. Among the actions identified by Metro to reduce emissions, the CAAP included the following measures related to energy resource management:

- > Switch directly operated buses to battery-powered technologies;
- > Deploy battery-powered buses in the contracted fleet;
- > Switch vanpool vehicles to battery-powered vehicles;
- > Replace non-revenue vehicles with battery-powered vehicles;
- > Install systems to store energy captured from trains;
- > Buy 100% renewable energy;
- > Install photovoltaic systems;
- > Install water-saving fixtures;
- > Install non-potable recycled water systems;
- > Install light-emitting diode (LED) lights at facilities;
- > Install electric heating systems;
- > Replace facility appliances with more efficient electric appliances;
- > Install electric vehicle (EV) charging at Metro facilities and implement an employee EV outreach plan.

Metro's Moving Beyond Sustainability Strategic Plan

The Metro Board of Directors adopted a new 10-year sustainability strategic plan – the Moving Beyond Sustainability Strategic Plan (MBSSP) (Metro, 2020f) – which updates and consolidates the principles established in Metro's prior sustainability planning documents, including Vision 2028, Long Range Transportation Plan, Equity Platform Framework, and the 2019 CAAP. The MBSSP includes objectives related to energy resource management, water quality and conservation, emissions and pollution control, materials and construction/operations, climate adaptation and resiliency, and equity in economic/workforce development, and establishes CALGreen Tier 2 as a standard for its capital projects. Targets related specifically to energy resource management included reducing energy consumption by 17% at facilities relative to the 2030 Business-as-Usual scenario and increasing onsite renewable energy generation to 7.5 MW. The following strategies related to energy resource management are outlined in the MBSSP:

- > **E1:** Implement projects identified in the energy conservation project portfolio;
- > **E2:** Optimize building management systems at all divisions and Gateway facility;
- > **E3:** Implement an agency-wide facility commissioning and retro-commissioning program;
- > **E4:** Expand the onsite renewable energy portfolio by completing identified solar photovoltaic projects, expanding photovoltaic operations and maintenance program, and identifying new opportunities for onsite renewable energy generation facilities;

- > **E5:** Developing supporting infrastructure for electric transportation.

3.12-1.3 Local Regulations

City of Lawndale

The Conservation Element of the City of Lawndale General Plan (1992f) is intended to promote the protection, maintenance, and use of the state’s natural resources; prevent the wasteful exploitation, destruction, and neglect of the state’s natural resources; and recognize that natural resources must be maintained for their ecological value as well as for their direct benefits to the public. The goals and policies listed in Table 3.12-2 apply to energy.

Table 3.12-2. City of Lawndale – Relevant Regulations

Code/Goal/Policy	Description
City of Lawndale General Plan Conservation Element	
Goal 3	Minimize negative environmental effects of supplying and using energy by reducing the community’s reliance upon traditional energy resources through initiation of energy conservation practices and the utilization of available energy technology.
Policy 3c	Encourage innovative building, site design and orientation techniques which minimize energy use.
Policy 1g	Examine and initiate where appropriate and feasible, the use of alternative water conservation systems, such as greywater and reclaimed water usage.

Source: City of Lawndale, 1992f

City of Redondo Beach

The Utilities Element of the City of Redondo Beach General Plan (1993h) inventories and describes the existing jurisdictions, facilities, and operation of the critical utilities (i.e., sanitary sewer, storm drainage, water, electricity, natural gas, and telecommunications) that are provided within the City of Redondo Beach. The goals and policies of the Utilities Element list in Table 3.12-3 apply to energy.

Table 3.12-3. City of Redondo Beach – Relevant Regulations

Code/Goal/Policy	Description
City of Redondo Beach General Plan Utilities Element	
Goal 6d	Provide an adequate, safe, and orderly supply of electrical energy to support the various existing and future land uses and development intensities in the city.
Policy 6.4.1	Improve and enhance cooperation and communication with the Southern California Edison Company (or any future purveyor of electricity to the city) to promote effective planning and ensure the most efficient and environmentally sensitive operation and maintenance of the city’s electricity supply system and facilities.

Source: City of Redondo Beach, 1993h

City of Torrance

The Community Resources Element of the General Plan (2010c) states objectives and policies to reduce dependence upon and conserve fossil fuels, minimize pollutant emissions, and implement the principles of sustainability within the City of Torrance. The objectives and policies of the Community Resources Element listed in Table 3.12-4 apply to energy.

Table 3.12-4. City of Torrance – Relevant Regulations

Code/Goal/Policy	Description
City of Torrance General Plan Community Resources Element	
Objective CR.21	Pursue the efficient use and conservation of energy resources to reduce consumption of natural resources and fossil fuels
Policy CR.21	Promote energy-efficient design features, including appropriate site orientation, use of light-colored roofing and building materials, and use of trees to reduce fuel consumption for heating and cooling

Source: City of Torrance, 2010c

3.12-2 Methodology

The CEQA Guidelines state that the assessment of potential impacts to energy resources should consider both direct and indirect effects of a project. Direct impacts to energy resources are those that result immediately from construction and operation of a project, such as station electricity and natural gas use, or fuel consumed by vehicles making trips to and from a project site. Indirect energy impacts are typically further removed from construction and operations and refer to energy used to produce and supply electricity, natural gas, water, and transportation fuels to end uses.

3.12-2.1 Energy Resources Quantification

3.12-2.1.1 Construction

Construction of the Proposed Project would result in the temporary, one-time expenditure of petroleum-based transportation fuels (i.e., gasoline and diesel fuel) associated with off-road construction equipment and on-road construction equipment and vehicles. This fuel consumption would represent a direct energy impact of Proposed Project construction and was analyzed quantitatively. The construction activities would consume diesel fuel in off-road equipment engines and on-road truck engines, as well as gasoline in light duty automobile and truck engines used by crew workers. Construction-related fuel consumption (gallons of diesel fuel and gasoline combusted by off- and on-road equipment and vehicles) was estimated using fuel consumption factors from the CARB OFFROAD2017 – ORION Emissions Inventory Model (2022c) and equipment activity inventories provided by Metro, as well as the CARB mobile source Emission FACtor (EMFAC) inventory model. Indirect impacts related to construction materials manufacturing, electricity generation at remote facilities, and petroleum fuels refining and distribution are evaluated qualitatively in the context of regional energy resource trends (CARB, 2021c). The EMFAC model is developed considering adopted or codified requirements related to vehicle fuel efficiency and engine technologies as well as regional fleet turnover (i.e., the phasing out of older vehicles over time). The EMFAC model accounts for the gradual electrification of the regional vehicle fleet, and the emission factors used in the analysis reflect the best representation of what vehicle mix CARB forecasts to comprise the regional fleet in each scenario year analyzed. Metro acknowledges that inherent uncertainties regarding the vehicle fleet mix forecasts exist that cannot be resolved quantitatively at this stage of the planning process.

Equipment inventories were based on the Advanced Conceptual Engineering requirements for construction activities involved in Proposed Project implementation. Estimates of total expected construction equipment activity to complete each phase of the Proposed Project were used in conjunction with CARB OFFROAD2017 fuel consumption factors to estimate diesel fuel consumption from off-road equipment. The CARB OFFROAD2017 - ORION Model utilizes a fuel consumption factor of 0.0574 gallons per horsepower-hour (gal/bhp-hr.) for equipment with engines up to 100 hp and a fuel consumption factor of 0.0516 (gal/bhp-hr.) for engines larger than 100 hp. Diesel fuel consumption

during construction activities was calculated using the following equation for each type of equipment involved in each phase of construction:

$$FC_i = HP_i \times LF_i \times FCF_i \times DU_i \times AD$$

Where:

FC_i = Equipment fuel consumption (gallons)

i = Type of equipment

HP_i = Equipment horsepower (provided by Metro)

LF_i = Equipment load factor (provided by CalEEMod)

FCF_i = Equipment fuel consumption factor based on HP

DU = Equipment Daily Usage (hours per day)

AD = Activity Duration (days)

The diesel fuel required by off-road equipment to complete each construction activity was then summed across the construction schedule to estimate total off-road diesel consumption.

Construction of the Proposed Project would also require on-road vehicle trips for demolition debris and excavated material hauling, construction materials deliveries, and trips by crew workers that would directly consume energy resources in the form of petroleum-based transportation fuels. The California Emissions Estimator Model (CalEEMod), Version 2022.1 (CAPCOA, 2022a), was used to estimate the air pollutant and GHG emissions that would be generated by vehicle trips involved in Proposed Project construction. The CARB GHG emissions inventory relies on emission factors correlated to fuel consumption provided by the USEPA in preparing its calculations. The 2020 USEPA Emission Factors for GHG Inventories include mobile source carbon intensity factors by fuel type. Using the CalEEMod output for emissions of carbon dioxide (metric tons of CO₂) during each construction activity, fuel consumption by diesel-fueled trucks and gasoline-fueled light duty automobiles and trucks were estimated using factors of 10.21 kilograms CO₂ per gallon diesel (kgCO₂/gal-D) and 8.78 kgCO₂/gal-G, respectively (USEPA, 2022c). Total diesel fuel consumption and motor gasoline consumption were estimated for all activities comprising construction of the Proposed Project and Options.

3.12-2.1.2 Operation

Operation of the Proposed Project would result in direct and indirect expenditures of energy resources. Direct energy effects of Proposed Project implementation would include the electricity required for propulsion of the electric rail cars of the Metro C Line (Green) along the extended route, as well as the change in transportation fuels consumption by regional traffic due to displaced vehicle trips resulting from mode shift to transit in lieu of passenger vehicles. Although construction of the Proposed Project and Options would require the relocation of existing freight tracks along portions of the alignment, the shifts in the freight tracks are not anticipated to result in any substantive changes to the freight train trip lengths. The direct effects to energy resources were analyzed quantitatively using a combination of forecasting tools from Metro, CARB, and USEPA. The indirect energy impacts would be related to the consumption of resources to provide the electricity for railcar propulsion, which is addressed qualitatively.

Metro tracks its systemwide operations and publishes an annual Energy and Resource Report that discloses performance metrics related to operational efficiency, air quality, climate, energy, water, and waste. Data obtained from the Metro Energy and Resource Report technical appendix was used to estimate the annual electricity consumption associated with the additional light rail miles that would result with implementation of the Proposed Project. The Metro electric rail systems averaged approximately 9.17 kilowatt-hours (kWh) per vehicle mile (kWh/mile) accounting for both light rail and heavy rail. The annual operational electricity consumption for the proposed light rail extension was conservatively estimated using this average per-mile consumption factor. Annual electrical demand for operation of the Proposed Project was then converted to MJ using a factor of 3.6 MJ/kWh, consistent with Metro's Energy and Resource Report methodology. CalEEMod was used to estimate electricity demand for the two proposed stations and lighting along the corridor, using a two-acre unenclosed parking structure as a surrogate for each of the stations based on preliminary design blueprints.

In addition to electricity used for railcar propulsion and station and corridor lighting, indirect energy impacts would also occur through the displacement of on-road vehicle trips and associated transportation fuels consumption. Operation of the Proposed Project would increase transit ridership opportunities, and the use of public transit would reduce community reliance on passenger vehicles. Regional transportation modeling was used to produce datasets of daily VMT on the roadway network with and without implementation of the Proposed Project in the year of 2042. The daily transportation fuels consumption under the No Project and Proposed Project condition in 2042 was estimated using average fleet fuel consumption factors from the CARB EMFAC model in terms of gallons per mile. Based on the CARB mobile source emissions inventory, the Los Angeles County regional passenger vehicle fleet in 2042 would consume approximately 28.73 gallons of gasoline and 0.09 gallons of diesel fuel per 1,000 VMT. The daily VMT displacement estimates produced by regional transportation modeling for the Proposed Project and Options were multiplied by the corresponding fuel consumption factors and extrapolated by a factor of 347 to estimate annual fuel consumption with and without implementation of the Proposed Project (CARB, 2021c). Total fuel consumption was converted to MJ to standardize the energy resources analysis.

3.12-2.2 Resource Study Area

The RSA for this report is defined as the utilities and service systems and energy service areas within the cities that the Proposed Project and options' alignment traverses. This varies by utility and service system provider as there are multiple of each throughout the corridor, with many of their service areas extending well outside the South Bay.

3.12-2.3 Significance Thresholds

Based upon the thresholds of significance contained in Appendix G of the CEQA Guidelines, implementation of the Proposed Project would result in a significant impact if either of the following were a result of implementation:

- a. Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation;
- b. Conflict with or obstruct a State or local plan for renewable energy or energy efficiency.

3.12-2.4 Project Features

As described in Chapter 2, Project Description a number of features have been incorporated into the project to ensure compliances with the laws, guidelines, and best practices of regulatory agencies. While

project features were not developed specifically for public services, Project Features (PF)-AQ-1, Metro Green Construction Policy, PF-AQ-3, Metro 2020 Moving Beyond Sustainability Strategic Plan, and PF-AQ-4 Metro Design Standards, as described in Section 3.4 Air Quality, Solar Readiness (CCR, Title 24, Part 6), and CALGreen Tier 2 (CCR, Title 24, Part 11) are relevant to energy in the RSA.

3.12-3 Affected Environment / Existing Conditions

Energy needs are typically measured in equivalent British Thermal Units (BTUs). A BTU is the standard measure of heat energy, in which it takes one BTU to raise the temperature of one pound of water by one degree Fahrenheit at sea level. Other units of energy can all be converted into equivalent BTU and, thus, the BTU is used as the basis for comparing energy consumption associated with different resources. Table 3.12-5 shows comparisons of various types of energy and their equivalent BTU.

Table 3.12-5. Energy Unit Comparisons

Energy Type	Energy Unit	Equivalent Megajoules (MJ)	Equivalent BTU
Electrical	Kilowatt-Hour	3.6	3,412
Natural Gas	Cubic Foot	1.1	1,037
	Therm	105	100,000
Heating Oil	Gallon	145	138,500
Motor Gasoline	Gallon	127	120,286
Diesel Motor Fuel	Gallon	145	137,381

Source: U.S. Energy Information Administration (EIA), 2022b.

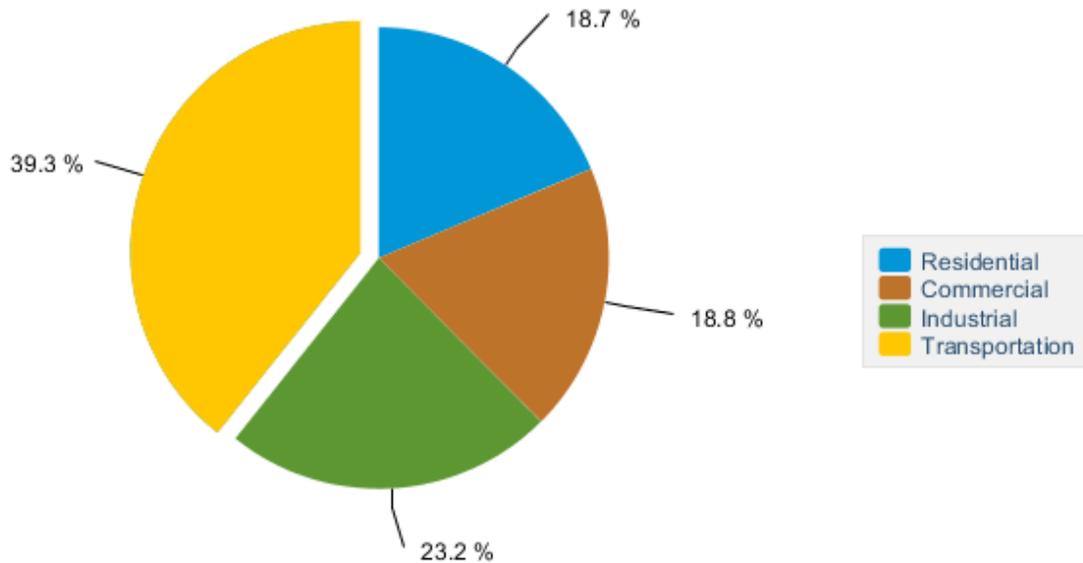
3.12-3.1 State Energy Use

According to the U.S Energy Information Administration (EIA) State Energy Profile, California is among the top states in the nation in net electricity generation from renewable resources, leading the nation in net electricity generation from solar, geothermal, and biomass. California is also a leading producer of electricity from conventional hydroelectric power and wind, ranking fourth in the nation in both. Substantial geothermal resources are also found in California's coastal mountain ranges and in the volcanic areas of northern California, as well as along the state's border with Nevada and near the Salton Sea.

Although California's wind power potential is widespread, especially along the state's eastern and southern mountain ranges, much of the state is excluded from development of this resource because of its wilderness areas, parks, or urban areas. California has one of the lowest per capita energy consumption rates in the country, partially attributable to energy-efficiency programs that have resulted in less energy consumption (EIA, 2022a). As part of the overall economy, the transportation sector is responsible for the most energy consumption of any sector within the state. More motor vehicles are registered in California than any other state, and commute times rank as some of the longest in the country.

California consumes more energy than any other state except Texas, yet the state has one of the lowest per capita energy consumption levels in the United States (EIA, 2022a). Current annual energy consumption in California (including transportation) is approximately 7,802 trillion BTUs, or approximately 8% of the nation's energy consumption. As shown in Figure 3.12-1 California's energy consumption by end use is 18.7% residential sector uses, 18.8% commercial sector uses, 23.2% industrial sector uses, and 39.3% transportation sector uses.

Figure 3.12-1. California Energy Consumption by End-Use Sector (2019)

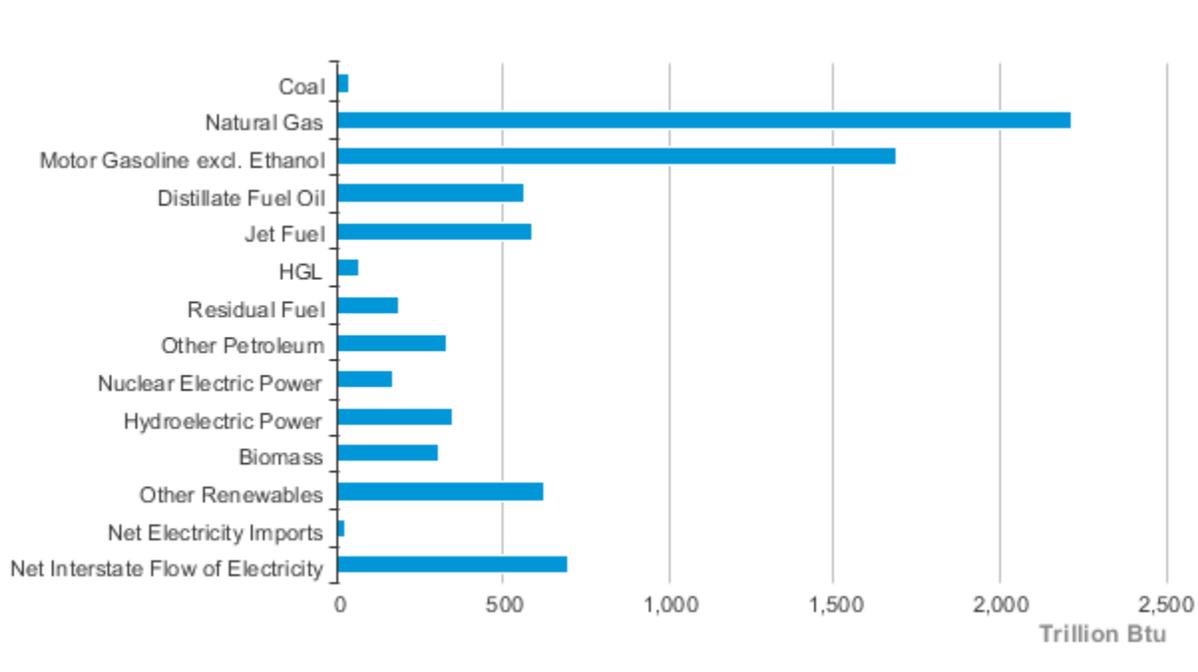


Source: EIA, 2022a

California’s consumption by source is shown in Figure 3.12-2. Natural gas and gasoline are the most consumed resources and account for 27.6% and 21.5% of all energy consumption, respectively, followed by jet fuel at 8.6%. Other renewables (solar, wind, etc.) account for approximately 7.7% of all energy consumption (EIA, 2022a). Other petroleum fuel accounts for approximately 4.2% of all energy consumption, followed by biomass at 3.7%, hydroelectric power at 3.0%, and nuclear electric power at 2.4%. A reduction in VMT due to the implementation of alternative modes of transportation could reduce energy use within the region.

Transporting water in California is another major consumer of energy. The California State Water Project is the single largest user of energy in the state and is maintained by the Department of Water Resources. The State Water Project uses approximately six billion kWh (approximately 20.5 trillion BTU) of electricity annually, which is equal to two to three percent of the total electricity consumed in California (California Department of Water Resources, 2020). Water-related energy consumes approximately 20% of the total electricity in California.

Figure 3.12-2. California Energy Consumption by Source (2019)



Source: EIA, 2022a

3.12-3.2 Regional Energy Use

Southern California’s energy consumption differs from the state as a whole in that a greater proportion of the energy consumed in the region is for the purposes of transportation, in relation to the high proportion of the population that relies on freeways and local roads for mobility, two major ports that serve as a hub for the movement of goods, and three large airports. Table 3.12-6 shows energy consumption for the SCAG region by energy use. Transportation accounts for approximately 45.1% of all energy use followed by commercial energy consumption at 25.8, and then residential energy consumption at 15.8%.

Table 3.12-6. SCAG Region Energy Consumption

Energy Use	Native Unit ¹	Btu in Trillions	Percent of Total Energy Consumption
Residential Electricity	42,722 GWh	350	15.8%
Residential Natural Gas	2 billion therms	200	9.0%
Commercial Electricity	49,881 GWh	571	25.8%
Commercial Natural Gas	0.5 billion Therms	50	2.3%
Water-Related Energy Use	13,040 GWh	45	2.0%
Transportation	8.3 Billion Gallons of Petroleum	998	45.1%

Source: SCAG, 2020b

¹ Each Gigawatt hours (GWh) is equivalent to one million kWh.

Transportation energy use is related to the number of VMT within the region. According to the SCAG 2020-2040 RTP/SCS, approximately 23.2 daily miles per capita were driven daily under the 2016 base year, approximately 21.8 daily miles per capita would be driven under 2045 baseline conditions and approximately 20.7 daily miles per capita are expected to be traveled under the 2045 plan conditions,

resulting in a 5% reduction compared to the baseline 2045 condition (SCAG, 2020b). A reduction in VMT due to the implementation of alternative modes of transportation could reduce VMT and therefore energy use within the region. The SCAG region is expected to add approximately 3.7 million more people by 2045 relative to the base year, which is expected to pose serious transportation challenges for the region, as travel demand in California will likely increase (SCAG, 2020c).

Metro’s contribution to regional energy consumption includes on-road vehicle fuel use (primarily compressed natural gas) and electricity for rail vehicle propulsion and maintenance and administrative facility operation. The Energy and Resource Report examined Metro’s total energy use by fuel type for the 2019 calendar year.

Additionally, Metro’s 2022 APTA Sustainability Performance Report provided an update on energy performance statistics during 2020–2021 (Metro, 2022a). The total systemwide energy consumption per VRM was 52.3 in 2020 and 52.1 in 2021, demonstrating a continued trend in Metro’s enhanced energy efficiency.

Table 3.12-7 displays the Metro system energy consumption by end use between 2015 and 2019. In total, rail propulsion resulted in the consumption of approximately 217.1 million kWh of energy in the year 2019 (Metro, 2020d). To offset electricity consumption levels, Metro constructed PV installations in 2018, which generated 2.65 million kWh in 2019; additional PV systems to generate renewable energy are expected in the future (Metro, 2019a).

Additionally, Metro’s 2022 APTA Sustainability Performance Report provided an update on energy performance statistics during 2020–2021 (Metro, 2022a). The total systemwide energy consumption per VRM was 52.3 in 2020 and 52.1 in 2021, demonstrating a continued trend in Metro’s enhanced energy efficiency.

Table 3.12-7. Metro Energy Consumption by Fuel Type per Vehicle Revenue Mile (All Metro Modes)

End Use	2015		2016		2017		2018		2019	
	MJ	BTU								
Vehicle Fuel	45.2	42,810	43.8	41,488	45.3	42,944	41.9	40,721	43.0	40,789
Rail Propulsion	5.6	5,312	5.5	5,227	6.1	5,751	6.4	5,941	6.3	5,976
Facility Energy	5.0	4,746	5.1	4,857	4.4	4,187	3.9	4,015	4.2	3,984
Total	55.8	52,868	54.4	51,572	55.8	52,882	52.2	50,677	53.5	50,749

Source: Metro, 2020d

In 2019, the Metro system accrued 124.7 million revenue miles while consuming approximately 52.2 MJ of energy per revenue mile on average across transportation modes, for a total of 6,667 million megajoules. On-road vehicle fuel consumption accounts for approximately 80% of the systemwide energy use, and electricity for rail propulsion represents approximately 12%. Metro facilities account for the remaining 8% of energy use. Metro has prioritized generating system energy from alternative fuels in recent years. In 2019, approximately 30% of Metro’s electricity was generated by renewable sources (Metro, 2020).

3.12-3.3 Local Energy Use

The SCAG 2020-2045 RTP/SCS forecasts changes in demographics, population, number of households, and number of jobs within the SCAG region for baseline year 2045. Compared to the base year 2016, all

of the Cities within the RSA are anticipated to grow along each of these factors. Table 3.12-8 shows the forecasted growth of Lawndale, Redondo Beach, and Torrance between 2016 and 2045.

Table 3.12-8. Local Population, Households, and Employment Growth Trends 2016-2045

City Name	Change in Population	Change in Households	Change in Employment
Lawndale	3.0%	5.2%	12.2%
Redondo Beach	6.9%	6.5%	11.4%
Torrance	4.1%	3.1%	5.7%

Source: SCAG, 2020c

SCAG does not provide VMT related data for individual cities within the SCAG region. As discussed in Section 3.12-3.2, the increase in population, households, and employment would be anticipated to result in an increase in daily and annual VMT within the RSA. Transportation energy use is related to VMT, and thus, the transportation energy demands of the applicable cities is anticipated to increase through 2045.

3.12-3.4 Effects of the COVID 19-Pandemic

Since 2020, the COVID-19 pandemic has impacted society through modifications in activity organization, changes to employment and travel, and the use of information and communication technologies. The most material effects of the pandemic on energy resources are related to patterns of regional mobility. According to a study by the University of California, Davis (UC Davis, 2022), in Fall of 2019, approximately 87% of workers within the SCAG region physically commuted to work at least one time each month, while approximately 13% exclusively worked remotely. During 2020 and 2021, the proportion of exclusively remote workers increased to 36% (Fall 2020) and 22.5% (Summer 2021), respectively. By the Summer of 2022, the percent of workers that physically commuted at least once per month rebounded to 88%, similar to pre-pandemic levels. However, the average monthly frequency of physical commutes among all workers in 2022 (12.8 days per month) remained considerably below the pre-pandemic level of 15.6 days per month. By Summer of 2021, the average number of monthly commuting trips was still 29% lower compared to the months before the pandemic.

Transit ridership also decreased substantially during the years 2020 and 2021 in tandem with a decrease in on-road vehicle trips. Commuting trips by rail within the SCAG region were 21% lower in the Summer of 2021 than during pre-pandemic conditions, and non-commuting trips decreased by 18%. As time goes on, further investigations into the long-term repercussions of the COVID-19 pandemic will be better understood. Eventually, it is anticipated that regional growth projections and regional transportation activities will recover to levels predicted prior to the COVID-19 pandemic. However, studies on the effects of the pandemic on regional transportation patterns and forecasted growth between existing conditions and the opening year of the Proposed Project and Options in the mid-2030s, or the horizon year of 2042 are not presently available. This impact analysis uses the best available data, including those described in preceding sections.

3.12-4 Environmental Impacts

3.12-1.1. *Would the Proposed Project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*

3.12-4.1.1 Construction Impacts

Less than Significant Impact. Diesel fuel for construction vehicles and equipment would be the primary source of energy use during the construction period. Construction activities would comply with Metro’s Green Construction Policy and construction equipment would be maintained in accordance with manufacturers’ specifications. As shown in Table 3.12-9, a one-time expenditure of approximately 1,314,000 gallons of diesel fuel and 102,000 gallons of gasoline would be needed to construct the Proposed Project over the approximately five-year duration. Annual average consumption would be approximately 239,000 gallons of diesel fuel and 18,000 gallons of gasoline throughout Proposed Project construction.

Table 3.12-9. Proposed Project Construction Energy Consumption

Construction Phase	Off-Road Equipment Fuel (Diesel Gallons)	On-Road Heavy-Duty Truck Fuel (Diesel Gallons)	Total Diesel Consumption (Diesel Gallons)	Construction Crew Vehicle Fuel (Gasoline Gallons)
Early Utility Relocation	155,163	30,069	185,232	14,398
Project Start-Up	7,457	80,901	88,358	4,972
Final Utility Relocations	70,149	20,470	90,619	12,001
Freight Track Bridges	20,574	25,465	46,039	4,992
Freight Retaining Walls	59,432	80,999	140,431	8,874
LRT Retaining Walls	83,000	53,379	136,379	6,329
Freight At-Grade Crossings	16,839	5,583	22,422	2,035
LRT Guideway Bridges	213,586	72,870	286,456	12,526
Freight Trackwork (BNSF)	14,670	50,245	64,915	3,037
Stations and Access	57,953	18,119	76,072	13,953
LRT Trackwork	50,072	78,648	128,720	11,614
Systems Construction	30,775	6,660	37,435	4,354
Testing/Commissioning	11,015	0	11,015	2,567
Proposed Project Construction Totals (Gallons)			1,314,093	101,652
Approximate Annual Average			238,926	18,483
Energy Unit Standardization				
Conversion Factor (MJ/Gal)			0.0088	0.0076
Total Energy (MJ)			11,564	773
Annual Average (MJ/year)			2,103	141

Source: STV, 2022; TAHA, 2022

All equipment and vehicles that would be used in construction activities would comply with applicable CARB regulations, the Pavley and Low Carbon Fuel Standards, and the CAFE Standards. Construction would not place an undue burden on available petroleum-based fuel resources. Based on the CARB EMFAC mobile source inventory and the USEPA GHG emissions factors database, the one-time expenditure of energy associated with diesel fuel and gasoline consumption would be offset by operations within one year through transportation mode shift. The temporary additional transportation fuels consumption does not require additional capacity provided at the local or regional level. CEC transportation energy demand forecasts indicate that gasoline and diesel fuel production is anticipated

to increase between 2021 and 2035, while demand for both gasoline and diesel transportation fuels is projected to decrease over the same time period (CEC, 2022b). Therefore, construction vehicles and equipment activities would not place an undue burden on available petroleum fuel resources during construction of the Proposed Project and Options.

Construction activities may include lighting for security and safety in construction zones. Lighting would be sparse and would not require additional capacity provided at the local or regional level.

As part of PF-AQ-1, Metro Green Construction Policy, the Proposed Project would control and minimize fuel consumption to the maximum extent feasible. All equipment and vehicles would be maintained in accordance with manufacturer specifications and would be subject to idling limits. As required by the CALGreen Code Tier 2, at least 80% of the nonhazardous construction debris generated by demolition activities will be diverted from landfills. Also, CALGreen includes the mandatory requirement to reuse or recycle all clean soil that would be displaced during construction of the Proposed Project. Furthermore, PF-AQ-3, Metro 2020 MBSSP, and PF-AQ-4, Metro Design Criteria and Standards requiring high-efficiency LED lighting would also hold construction activities to use energy efficiently.

Based on the substantiation provided above, construction would not result in wasteful, inefficient, or unnecessary consumption of energy resources. Therefore, the Proposed Project would result in a **less than significant impact** related to construction activities.

TRENCH OPTION

Less than Significant Impact. The types of construction activities for the Trench Option would be similar to the Proposed Project, although Trench Option construction would take two more years to complete and involve increased excavation and hauling of soil for the trench along with wall shoring activities, as well as the elimination of at-grade rail crossings for the new light rail alignment. Construction activities involved in implementation of the Trench Option are anticipated to last approximately seven years. Construction activities would comply with Metro’s Green Construction Policy and construction equipment would be maintained in accordance with manufacturers’ specifications. Table 3.12-10 summarizes the petroleum fuels consumption that would occur during construction of the Trench Option.

Table 3.12-10. Trench Option Construction Energy Consumption

Construction Phase	Off-Road Equipment Fuel (Diesel Gallons)	On-Road Heavy-Duty Truck Fuel (Diesel Gallons)	Total Diesel Consumption (Diesel Gallons)	Construction Crew Vehicle Fuel (Gasoline Gallons)
Early Utility Relocation	155,163	30,852	186,015	14,398
Project Start-Up	7,457	32,615	40,072	4,972
Final Utility Relocations	70,149	20,470	90,619	11,827
Freight Track Bridges	22,310	28,795	51,105	3,975
Freight Retaining Walls	89,148	77,865	167,013	13,876
LRT Retaining Walls	83,000	51,126	134,126	5,364
LRT Guideway Bridges	279,305	104,897	384,202	14,883
Freight At-Grade Crossings	16,839	5,387	22,226	1,891
LRT Guideway Trench	256,841	170,323	427,164	27,409
Freight Trackwork (BNSF)	95,490	58,472	153,962	19,235
Stations and Access	70,840	22,625	93,465	16,810
LRT Trackwork	50,072	75,906	125,978	11,355
Systems Construction	30,775	6,758	37,533	4,434
Testing/Commissioning	11,015	0	11,015	2,451
Proposed Project Construction Totals (Gallons)			1,924,495	152,880
Approximate Annual Average			296,077	23,520
Energy Unit Standardization				
Conversion Factor (MJ/Gal)			0.0088	0.0076
Total Energy (MJ)			16,936	1,162
Annual Average (MJ/year)			2,606	212

Source: STV, 2022; TAHA, 2022

Note: Calculations include energy consumption for the Proposed Project south of 190th Street.

Like the Proposed Project, PF-AQ-1, PF-AQ-3, and PF-AQ-4 would hold construction activities for the Trench Option to use energy efficiently. As shown in Table 3.12-10, a one-time expenditure of approximately 1,900,000 gallons of diesel fuel and 153,000 gallons of gasoline would be needed to construct the Trench Option over the seven-year duration. Similar to discussed above for the Proposed Project, construction would not result in wasteful, inefficient, or unnecessary consumption of energy resources. Furthermore, Trench Option operations would offset the entire construction petroleum fuels energy consumption during the first year of operations due to displaced vehicle trips. Therefore, the Trench Option would result in a **less than significant impact** related to construction activities.

HAWTHORNE OPTION

Less than Significant Impact. The types of construction activities for the Hawthorne Option would be similar to the Proposed Project, with the primary deviation being that no at-grade rail crossings would be constructed and the guideway would be elevated along Hawthorne Boulevard, requiring additional structural work. Construction activities involved in implementation of Hawthorne Option are anticipated to last approximately five years, but would start later than the Proposed Project as coordination with Caltrans would be required prior to construction. Construction activities would comply with Metro’s Green Construction Policy and construction equipment would be maintained in accordance with manufacturers’ specifications. Table 3.12-11 summarizes the petroleum fuels consumption that would occur during construction of the Hawthorne Option.

Table 3.12-11. Hawthorne Option Construction Energy Consumption

Construction Phase	Off-Road Equipment Fuel (Diesel Gallons)	On-Road Heavy-Duty Truck Fuel (Diesel Gallons)	Total Diesel Consumption (Diesel Gallons)	Construction Crew Vehicle Fuel (Gasoline Gallons)
Early Utility Relocation	155,163	27,228	182,391	13,397
Project Start-Up	7,457	60,039	67,496	4,803
Final Utility Relocations	70,149	19,197	89,346	11,622
LRT Guideway Bridges	312,152	209,305	521,457	16,819
Freight Retaining Walls	29,716	47,698	77,414	4,568
LRT Retaining Walls	83,000	6,758	89,758	6,146
Freight Trackwork (BNSF)	29,395	23,996	53,391	6,092
Stations and Access	74,041	17,924	91,965	17,252
LRT Trackwork	50,072	76,004	126,076	10,484
Systems Construction	30,775	6,660	37,435	4,429
Testing/Commissioning	11,015	0	11,015	2,393
Total Construction			1,347,744	98,005
Annual Average			224,624	16,335
Energy Unit Standardization				
Conversion Factor (MJ/Gal)			0.0088	0.0076
Total Energy (MJ)			11,861	745
Annual Average (MJ/year)			1,977	125

Source: STV, 2022; TAHA, 2022

Note: Calculations include energy consumption for the Proposed Project south of 190th Street.

Like the Proposed Project, PF-AQ-1, PF-AQ-3, and PF-AQ-4 would hold construction activities for the Hawthorne Option to use energy efficiently. As shown in Table 3.12-11, a one-time expenditure of approximately 1,300,000 gallons of diesel fuel and 98,000 gallons of gasoline would be needed to construct the Hawthorne Option over the five-year duration. Similar to discussed above for the Proposed Project, construction would not result in wasteful, inefficient, or unnecessary consumption of energy resources. Additionally, the petroleum fuels combustion energy displacement that would occur through eliminated vehicle trips would more than offset the expenditure of fuels during construction of the Hawthorne Option, as summarized below in Table 3.12-12. Therefore, the Hawthorne Option would result in a **less than significant impact** related to construction activities.

3.12-4.1.2 Operational Impacts

Less than Significant Impact. The Proposed Project would directly result in the consumption of energy related to the light rail propulsion systems and lighting and accessory equipment at station platforms. Electricity would be provided to the light rail line by TPSS units and to stations by traditional distribution connection facilities (e.g., power poles, underground wires, and transmission lines). The Proposed Project would indirectly change regional energy consumption through changes in regional VMT by displacing vehicle trips for transit trips, which would reduce petroleum fuels consumption.

As shown in Table 3.12-12, the Proposed Project would reduce annual regional energy consumption from the future without Project condition by approximately 36.44 million MJ in the design/horizon year of 2042 when accounting for direct energy consumption and indirect fuels energy savings. Total electricity consumption to power the light rail extension would be 7,829 MWh (28,182,841 MJ), which would represent an increase of 0.4% of total Metro system and facilities annual electricity consumption as of 2019. This incremental increase in electricity demand would not place an undue burden on the existing electrical infrastructure and represents a miniscule fraction of the total Metro electricity use. All outdoor lighting fixtures at stations, parking facilities, and along the light rail corridor would comply with the CALGreen Tier 2 Prerequisite for Outdoor Lighting, which sets energy efficiency standards at 90 percent of allowed outdoor lighting power under Title 24 Part 6, Section A5.203.1.1.1. However, it is not currently practicable to estimate the resulting reduction in electricity consumption relative to the energy consumption rates that were used in the calculations.

Table 3.12-12. Operational Energy Consumption

Energy Resource	Units	Proposed Project	Trench Option	Hawthorne Option
Rail Propulsion Electricity	MWh/year	6,947	6,947	6,947
Station & Lighting Electricity	MWh/year	882	882	882
Total Operational Electricity	MWH/year	7,829	7,829	7,829
<i>Unit Conversion</i>	<i>MJ/MWh</i>	<i>3,600</i>	<i>3,600</i>	<i>3,600</i>
Electricity Energy	MJ/year	28,182,841	28,182,841	28,182,841
Vehicle Trip Displacement	VMT/year	(17,083,851)	(17,083,851)	(17,207,383)
Annual Fuel Savings	Gasoline-Gallon Equivalents (GGE)/year	(492,654)	(492,654)	(496,216)
<i>Unit Conversion</i>	<i>MJ/GGE</i>	<i>131.2</i>	<i>131.2</i>	<i>131.2</i>
Petroleum Fuels Energy	MJ/year	(64,625,706)	(64,625,706)	(65,093,010)
Net Total Operational Energy	MJ/year	(36,442,865)	(36,442,8665)	(36,910,169)

Source: TAHA, 2022

These reductions are consistent with objectives of regional planning strategies to reduce reliance on fossil fuels and non-renewable resources. The effects of Proposed Project operations on regional petroleum-based transportation would not constitute a wasteful or inefficient use of energy resources. On the contrary, implementation of the Proposed Project would improve regional transportation energy

efficiency. Therefore, the Proposed Project would result in a **less than significant impact** related to operational activities.

TRENCH OPTION

Less than Significant Impact. The Trench Option follows the same alignment as the Proposed Project and includes the same stations. The ridership and associated VMT displacements are identical for the Proposed Project and the Trench Option. Annual energy resource consumption for the Trench Option is summarized in Table 3.12-12. As described above, the Trench Option would result in a regional reduction in energy consumption equivalent to approximately 36.44 million MJ in 2042. Therefore, the Trench Option would result in a **less than significant impact** related to wasteful, inefficient, or unnecessary consumption of energy resources during operations.

HAWTHORNE OPTION

Less than Significant Impact. The Hawthorne Option would directly result in the consumption of energy related to the light rail propulsion systems and lighting and accessory equipment at station platforms. Electricity would be provided to the light rail line by TPSS units and to stations by traditional distribution connection facilities (e.g., power poles, underground wires, and transmission lines). The Hawthorne Option would indirectly change regional energy consumption through changes in regional VMT. Regional traffic modeling for the Hawthorne Option determined that the daily VMT displacement would be passenger vehicle miles. In estimating fuel consumption, it was assumed that all displaced vehicle trips that would have otherwise occurred without implementation of the Hawthorne Option would be passenger vehicles (i.e., non-trucks). As shown in Table 3.12-12, above, the Hawthorne Option operations would reduce annual regional energy consumption from the No Build Alternative by 36.91 million MJ. These reductions are consistent with objectives of regional planning strategies to reduce reliance on fossil fuels and non-renewable resources.

Additionally, Hawthorne Option operations would require an additional 7,829 MWh (25 million MJ) of electricity relative to the existing Metro system. This would represent an increase of only 0.4% relative to 2019 systemwide energy consumption and would not place an undue burden on the existing electrical infrastructure. The effects of Hawthorne Option operations on regional petroleum-based transportation would not constitute a wasteful or inefficient use of energy resources. Implementation of the Proposed Project would improve regional transportation energy efficiency. Therefore, the Hawthorne Option would result in a **less than significant impact** related to operational activities.

3.12-1.2. Would the Proposed Project conflict with or obstruct a State or local plan for renewable energy or energy efficiency?

3.12-4.1.3 Construction Impacts

Less than Significant Impact. Energy resources consumption during construction of the Proposed Project would be predominantly combustion of petroleum-based transportation fuels. Construction would result in a one-time expenditure of approximately 1,300,000 gallons of diesel fuel and 102,000 gallons of gasoline over the approximately five years of activities. Average annual fuel consumption would be approximately 239,000 gallons of diesel fuel and 18,000 gallons of gasoline. Implementation of Metro's Green Construction Policy as part of PF-AQ-1, the CALGreen Code, and Title 24 would ensure that construction would be consistent with State and local energy plans and policies to reduce energy consumption. PF-AQ-1 commits Metro contractors to using less-polluting construction equipment and vehicles and implementing best practices to reduce harmful diesel emissions. Best practices include Tier 4 emission standards for off-road diesel-powered construction equipment with greater than 50 hp and

restricting idling to a maximum of five minutes. Compliance with these provisions would limit excess petroleum fuels consumption during active use of off-road equipment and on-road vehicles. The CALGreen Code Tier 2 requires reduction, disposal, and recycling of at least 80% of nonhazardous construction materials and requires demolition debris to be recycled and/or salvaged, which would ultimately result in reductions of indirect energy use associated with waste disposal and storage. Therefore, the Proposed Project would result in a **less than significant impact** related to construction activities.

TRENCH OPTION

Less than Significant Impact. As summarized in Table 3.12-10, construction of the Trench Option would result in a one-time expenditure of approximately 1,900,000 gallons of diesel fuel and 153,000 gallons of gasoline. Average annual fuel consumption would be approximately 296,000 gallons of diesel fuel and 24,000 gallons of gasoline. Similar to the Proposed Project, implementation of PF-AQ-1, the CALGreen Code, and Title 24 would ensure that construction would be consistent with State and local energy plans and policies to reduce energy consumption. PF-AQ-1 commits Metro contractors to using less-polluting construction equipment and vehicles and implementing best practices to reduce harmful diesel emissions. Best practices include Tier 4 emission standards for off-road diesel-powered construction equipment with greater than 50 hp and restricting idling to a maximum of five minutes which would limit excess petroleum fuels consumption during active equipment and vehicle use. The CALGreen Code Tier 2 requires reduction, disposal, and recycling of at least 80% of nonhazardous construction materials and requires demolition debris to be recycled and/or salvaged. Additionally, all clean soil that would be excavated and displaced during construction of the Trench Option would be required to be reused or recycled under CALGreen requirements. Therefore, the Trench Option would result in a **less than significant impact** related to construction activities.

HAWTHORNE OPTION

As summarized in Table 3.12-11, construction of the Hawthorne Option would result in a one-time expenditure of approximately 1,348,000 gallons of diesel fuel and 98,005 gallons of gasoline. Average annual fuel consumption would be approximately 225,000 gallons of diesel fuel and 16,000 gallons of gasoline. Similar to the Proposed Project, implementation of PF-AQ-1, the CALGreen Code, and Title 24 would ensure that construction would be consistent with State and local energy plans and policies to reduce energy consumption. PF-AQ-1 commits Metro contractors to using less-polluting construction equipment and vehicles and implementing best practices to reduce harmful diesel emissions. Best practices include Tier 4 emission standards for off-road diesel-powered construction equipment with greater than 50 hp and restricting idling to a maximum of five minutes. The CALGreen Code requires reduction, disposal, and recycling of at least 50% of nonhazardous construction materials and requires demolition debris to be recycled and/or salvaged. Therefore, the Hawthorne Option would result in a **less than significant impact** related to construction activities.

3.12-4.1.4 Operational Impacts

Less than Significant Impact. The Proposed Project is a light rail system extension providing energy efficient mass transit to communities in need of enhanced accessibility options. The Proposed Project would reduce auto passenger vehicle trips and reduce reliance on petroleum-based transportation fuels. The Proposed Project would be considered by OPR as a “sustainable transportation project” that encourages the use of active transportation, transit, and ZEVs through the creation of multi-use trails and paths (OPR, 2021). The benefits of the Proposed Project are consistent with the goals, objectives, and policies of SCAG and the Cities of Lawndale, Redondo Beach, and Torrance as outlined in the local regulatory framework above. As the renewable energy portfolios of Metro and local jurisdictions expand over time, natural resources consumption to provide the electricity required for operations would become more energy efficient. The Proposed Project would not conflict with any adopted plan or regulation to enhance energy efficiency or reduce transportation fuels consumption and would support the initiatives of the Metro Climate Action and Adaptation Plan. In addition, the Proposed Project would not interfere with renewable portfolio targets and would not result in a wasteful or inefficient expenditure of energy resources. The Proposed Project would positively contribute to statewide, regional, and local efforts to create a more efficient and sustainable transportation infrastructure network. Therefore, the Proposed Project would result in a **less than significant impact** related to operational activities.

TRENCH OPTION

Less than Significant Impact. The Trench Option follows the same alignment as the Proposed Project and includes the same stations and operating pattern. As described above, the Proposed Project would not result conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Therefore, the Trench Option would result in a **less than significant impact**.

HAWTHORNE OPTION

Less than Significant Impact. The Hawthorne Option follows a similar alignment as the Proposed Project and includes the same number of stations and operating pattern. As described above, the Proposed Project would not result conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Therefore, the Hawthorne Option would result in a **less than significant impact**.

3.12-5 Mitigation Measures

No mitigation measures are required, as there are no significant impacts on energy resources.

3.12-6 Project Impacts Remaining After Mitigation

As described in Section 3.12-5, no mitigation measures are required to reduce construction and operation impacts to a level below significance.

3.12-7 Cumulative Impacts

The methodology for cumulative analysis and a description of relevant projects and projections are included in Section 3.0, Introduction.

The geographic scope of the cumulative analysis for energy resources is the service area for the various providers. All probable future projects described in the project list in Section 3.0 fall within the scope of the cumulative analysis.

Between the established year of existing conditions (2021) in this document and the design year of the Proposed Project and Options being analyzed (2042), significant changes in the regional transportation network, energy demands of transportation technologies, and the renewable profile of electricity generation at SCE facilities will occur. Metro is developing an array of projects and infrastructure improvements that will serve to assist the transition away from petroleum fossil fuels and the expansion of zero-emission transportation technologies. The discussions of project-specific and cumulative impacts considered the anticipated improvements in vehicle fuel efficiency, changes in engine technologies, and availability of cleaner electricity in the design year scenario. However, it would not provide informational value to speculate on how entities, organizations, and businesses outside of Metro would adapt to the changing energy resources landscape. Therefore, the discussion of cumulative impacts focuses on the projected supply of transportation fuels and electricity from regional producers and whether the effects of the Proposed Project and Options would be significant in terms of reducing or compromising the availability of those resources. The potential for wasteful or inefficient use of those resources was also evaluated.

3.12-7.1 Proposed Project

There is an existing cumulative impact related to energy resources. The cumulative setting is both regional and statewide. State, regional, and local agencies and jurisdictions have published a wide range of documents intended to reduce energy consumption and increase the use of renewable energy. The intent is typically to reduce the use of nonrenewable energy to reduce pollution that contributes to global warming. The Proposed Project combined with past, present, and reasonably probable future projects could contribute to the existing cumulative impact.

Regarding construction activities, as shown in Table 3.12-12, a one-time expenditure of approximately 1,831,849 gallons of diesel fuel and 101,652 gallons of gasoline would be needed to construct the Proposed Project over the approximately five-year duration. Annual average transportation fuels demand would be approximately 239,000 gallons of diesel fuel and 18,500 gallons of gasoline during construction of the Proposed Project between 2027–2033. Los Angeles County retail sales of diesel fuel and gasoline in 2020 were approximately 299 million gallons and 2,770 million gallons, respectively (CEC, 2021). Relative to existing petroleum-based transportation fuels consumption in Los Angeles County (in 2020), construction of the Proposed Project would temporarily increase annual diesel fuel consumption within the County by approximately 0.61% and would temporarily increase annual gasoline fuel consumption by approximately 0.002%. Data from the CARB EMFAC2021 mobile source emission inventory model project that on-road vehicles within the South Coast Air Basin portion of Los Angeles County will consume 572 million gallons of diesel fuel and 3,298 million gallons of gasoline in 2027 (CARB, 2022a). Construction of the Proposed Project would increase forecasted regional diesel fuel and gasoline consumption in the first year of construction by approximately 0.04% and by less than 0.001%, respectively. These increases would not place an undue burden on existing petroleum-based transportation fuels reserves or supply within Los Angeles County.

There are numerous State and regional regulatory measures designed to minimize excess transportation fuels consumption, as discussed in Section 3.12-1. All equipment and vehicles that would be used in construction activities would comply with applicable CARB regulations, the Pavley and Low Carbon Fuel Standards, and the Corporate Average Fuel Economy Standards. The Proposed Project would adhere to the provisions of the Metro Green Construction Policy to control and minimize emissions to the maximum extent feasible (Metro, 2011). Adherence to the energy reduction policies and the relatively low use of energy resources for construction ensure that the Proposed Project would not result in a significant impact. The Proposed Project would also be consistent with GHG reduction plans. Therefore,

the Proposed Project construction activities would not have a cumulatively considerable contribution to the existing cumulative impact.

Regarding operational activities, The Proposed Project would indirectly change regional energy consumption through changes in regional VMT. As shown in Table 3.12-9, the Proposed Project would reduce annual regional energy consumption by 40.73 million MJ relative to the future (2042) without Proposed Project conditions. The increase in operational electricity demand (7,829 MWh annually) would represent an increase of approximately 0.007% relative to forecasted SCE electricity demand in 2035 (CEC, 2022b). SCE is projected to have a systemwide demand of 107,031 GWh in 2035 and an available electricity supply of 112,539 GWh, with a net surplus of approximately 5,500 GWh. Thus, Proposed Project electricity demand would not place an undue burden on SCE's electricity supply. The increase in operational electricity demand (6,947 MWh annually) would represent an increase of 0.38% relative to existing Metro systemwide consumption.

The effects of Proposed Project operations would reduce regional petroleum-based energy consumption and would improve regional transportation energy efficiency. The Proposed Project is also considered a "sustainable transportation project" by the OPR definition of "transportation projects that encourage the use of active transportation, transit, and ZEVs" as it would create multi-use trails and paths for future patrons (OPR, 2021). Therefore, the Proposed Project operational activities would not have a cumulatively considerable contribution to the existing cumulative impact.

3.12-7.2 Trench Option

As summarized in Table 3.12-10, construction of the Trench Option would result in a one-time expenditure of approximately 1,924,500 gallons of diesel fuel and 152,900 gallons of gasoline during the seven year period. Average annual fuel consumption would be approximately 296,100 gallons of diesel fuel and 23,600 gallons of gasoline. These quantities represent incremental increases of approximately 0.05% and less than 0.001% relative to forecasted on-road vehicle fuel consumption within the South Coast Air Basin portion of Los Angeles County in 2027 (CARB, 2022b). Construction activities to implement the Trench Option would comply with applicable State and regional best management practices to minimize excess transportation fuels consumption. Construction of the Trench Option would result in less than significant cumulative impacts related to regional energy resources.

The long-term operational energy effects of the Trench Option are summarized in Table 3.12-12. Similar to the Proposed Project analysis, the Trench Option would result in an incremental increase of 7,829 MWh in electricity consumption on SCE's grid, and would displace approximately 64,626,000 MJ of transportation fuels energy, for a net energy benefit of 36.4 million MJ. Similar to the Proposed Project, operational electricity requirements would not place a strain on available SCE power supply, which is forecasted to have a net surplus of 5,500 GWh in 2035 (CEC, 2022b). Therefore, operation of the Trench Option would not have a cumulatively considerable contribution to the existing cumulative impact.

3.12-7.3 Hawthorne Option

Table 3.12-11 discloses that construction of the Hawthorne Option would result in a one-time expenditure of approximately 1,924,500 gallons of diesel fuel and 98,000 gallons of gasoline. Average annual fuel consumption would be approximately 224,700 gallons of diesel fuel and 16,400 gallons of gasoline over the approximately five-year duration. These quantities are similar to those analyzed for the Proposed Project and would not represent significant increases in regional transportation fuels demand. Furthermore, all construction activities would comply with applicable regulations and implement best management practices in accordance with the Metro Green Construction Policy to

minimize excess fuel consumption. As summarized in Table 3.12-12, operational energy use would be similar to what is presented above for the Proposed Project. Similar to the Proposed Project analysis, the Hawthorne Option would not have a cumulatively considerable contribution to the existing cumulative impact.