4.6 ENERGY

This section evaluates the energy impacts of the proposed Plan. The information presented was compiled from multiple sources, including reports from the California Energy Commission (CEC), California Public Utilities Commission (CPUC), and SANDAG.

4.6.1 EXISTING CONDITIONS

EXISTING ENERGY USE

Energy is consumed during the construction and operation of transportation and land use projects. In 2012, total statewide energy consumption in California was approximately 7,641 trillion British thermal units (Btus) (EIA 2014). California ranked second compared to other states in total energy consumption. However, the per-capita consumption rate in California is one of the lowest in the country and ranks 49th of all states (EIA 2014). This is largely because of California's proactive energy efficiency programs and mild weather, which reduces energy demands for heating and cooling.

The transportation sector makes up the single largest consumer of energy in California, accounting for 39 percent of the state's total energy demand, and nearly all of this energy is provided by petroleum (EIA 2014). The industrial, residential, and commercial sectors are the next largest consumers of energy, primarily related to electricity and natural gas use. The industrial sector accounts for 23 percent of the total energy consumption in the state (EIA 2014). The residential and commercial sectors both account for approximately 19 percent of the energy consumption (EIA 2014).

Electricity generation is typically measured in gigawatt-hours (GWh), megawatt-hours (MWh), or kilowatt-hours (kWh). In 2012, total electricity consumed in California was 302,113 GWh (CEC 2014a). A single gigawatt provides enough energy to power 95 average California homes per year (SANDAG 2014). Natural gas-fired generation is the primary source of electricity generation in California and fuels approximately 61 percent of electricity consumption. Nuclear power typically provided 20 percent of the state's total electricity generation. However, the reactors at the San Onofre nuclear plant were shut down in 2012, reducing the amount of electricity generation from nuclear power. California's electrical system has also become more reliant on renewable energy sources, including cogeneration, wind energy, solar energy, geothermal energy, and hydroelectric plants. In 2012, 17 percent of all electricity came from renewable resources such as wind, solar, geothermal, biomass, and small hydroelectric facilities. Large hydro plants generated another 12 percent of electricity in California.

Overall, energy is generated over large areas from many different sources. Energy that is not generated at a facility by an energy provider can be purchased from other producers and transmitted to the energy user through energy transmission networks. California consumes much more electricity than it generates, and approximately 25 percent of California's electricity comes from outside the state (EIA 2014). California imports most of this energy from northwestern and southwestern states. The San Diego region consumed approximately 20,297 GWh of electricity and 560 million therms of natural gas in 2010 (SANDAG 2014).

TRANSPORTATION AND FUEL USE

As mentioned earlier, transportation is the largest consumer of energy in California. In 2012, total gasoline consumed in the state was 14.6 billion gallons (BOE 2014a). Diesel fuel is the second most used transportation fuel in California behind gasoline. In 2012, more than 2.6 billion gallons of diesel were sold in California (BOE 2014b). Plug-in electric vehicles (PEVs) are a key component of California's strategy to meet climate, clean air, and energy goals. As of December 2014, more than 118,000 PEVs were sold in California, representing about 40 percent of national PEV sales (CEC 2015). In 2013, Californians also used 174 million therms of natural gas as a transportation fuel, or the equivalent of 142 million gallons of gasoline, and 841,345 MWh of electricity for transportation, or about the equivalent of 25 million gallons of gasoline (CEC 2015).

Passenger cars and light-duty trucks are the largest consumers of transportation fuel in the state and the San Diego region. Passenger cars and light-duty trucks account for 1.6 billion gallons of gasoline and diesel fuel per year, or approximately 85 percent of total energy consumption by on-road vehicles in the San Diego region (SANDAG 2014). The rail transportation category also consumes diesel fuel for freight and goods movement, the COASTER commuter rail line, and the SPRINTER light-rail line. The light-rail San Diego Trolley is powered by electricity. Data is not currently available for the consumption of alternative fuels in the San Diego region. However SANDAG does track alternative fuel infrastructure; there are currently 15 biodiesel, 10 E85, 24 natural gas, and 19 propane stations (SANDAG 2014). The San Diego region also has over 10,000 plug-in electric vehicles (CSE 2015) and over 500 publicly accessible electric vehicle charging stations (DOE 2015).

ENERGY SERVICE PROVIDERS

San Diego Gas and Electric (SDG&E) is the owner and operator of natural gas and electricity transmission and distribution infrastructure in the San Diego region. SDG&E obtained 63 percent of its energy from natural gas in 2012. SDG&E renewable energy is the second largest energy source and includes biomass and waste, geothermal, small hydroelectric, solar, and wind sources. SDG&E obtained 23.6 percent of its energy from renewable resources in 2013 (CPUC 2015). Additionally, SDG&E's other energy sources include coal and unspecified sources.

SDG&E develops a long-term procurement plan (LTPP), which outlines the company's approach to procuring new resources to meet future energy needs of the region. In 2014, the CPUC Energy Division approved SDG&E's LTPP that includes up to 800 megawatts (MW) of new resources by 2022 with a minimum of 200 MW coming from energy efficiency, demand response, renewables, combined heat and power resources, and distributed generation.

Table 4.6-1 shows SDG&E renewable energy projects that are currently approved by CPUC and online. Table 4.6-2 shows additional projects that have been approved by CPUC and are in development. These projects would provide renewable energy to SDG&E and are anticipated to be operational prior to 2020.

Table 4.6-1
SDG&E Renewable Energy Projects Approved and Online, March 2015

Projects Approved and Online	Status	Min MW	Min Expected GWh/yr	Technology	Contract Term (years)	Location
GRS (Coyote Canyon)	Operational	8	60	Biogas	10	Irvine, CA
MM Miramar	Operational	3	22	Biogas	10	Miramar, San Diego County
MM San Diego North City	Operational	1	7	Biogas	10	San Diego, CA
FPL	Operational	16	24	Wind	14.5	Palm Springs, CA
GRS (Sycamore 2)	Operational	3	19	Biogas	12	Santee, CA
Iberdrola Renewables Mountain Wind	Operational	25	89	Wind	15	Riverside County, CA
Iberdrola Renewables Phoenix West	Operational	25	89	Wind	15	Riverside County, CA
Oasis Power Partners	Operational	60	179	Wind	15	Mojave, CA
Rancho Peñasquitos	Operational	5	20	Small Hydro	10	San Diego County, CA
Kumeyaay Wind	Operational	51	101	Wind	20	San Diego County, CA
MM Prima Deshecha Energy Phase 1	Operational	15	118	Biogas	15	San Juan Capistrano, CA
Otay Landfill 3	Operational	4	24	Biogas	10	Chula Vista, CA
Pacific Wind LLC	Operational	140	392	Wind	20	Tehachapi, CA
City of San Diego (Point Loma)	Operational	5	22	Biogas	5	San Diego, CA
Campo Verde/Mt. Signal Solar	Operational	49	168	Solar PV	20	Fillaree Ranch, Imperial Valley, CA
Covanata Delano	Operational	49	365	Biomass	10	Delano, Kern County, CA
Glacier Wind 1 (Naturener)	Operational	107	318	Wind	15	Toole, MT
Glacier Wind 2 (Naturener)	Operational	104	318	Wind	15	Toole, MT
Renewable Energy Providers - Blue Lake	Operational	11	90	Biomass	15	Eureka, CA
Calpine Geysers	Operational	25	212	Geothermal	4.8	Sonoma and Lake Counties, CA
Coram Energy	Operational	8	27	Wind	15	Tehachapi, Kern County, CA
Centinela Solar (expansion)	Operational	30	62	Solar PV	20	Calexico, CA
Imperial Solar Energy Center-South	Operational	130	307	Solar PV	25	8 mi SW of El Centro, CA
NRG Solar Borrego I LLC	Operational	26	59	Solar PV	25	Borrego Springs, CA
Arlington Valley Solar Energy II	Operational	127	270	Solar PV	25	Arlington, AZ
SG2 Imperial Valley	Operational	150	390	Solar PV	25	Calipatria, CA
Mesa Wind	Operational	30	55	Wind	2	Whitewater, CA
Ocotillo Express Wind Project	Operational	265	891	Wind	20	Ocotillo, CA
Catalina (enXco)	Operational	106	224	Solar PV	25	Kern County, CA
Sol Orchard 20 (Ramona 1)	Operational	2	3	Solar PV	25	Ramona, CA
Sol Orchard 21 (Ramona 2)	Operational	5	8	Solar PV	25	Ramona, CA
Sol Orchard 22 (Valley Center 1)	Operational	2	4	Solar PV	25	Valley Center, CA
Sol Orchard 23 (Valley Center 2)	Operational	5	8	Solar PV	25	Valley Center, CA
Manzana	Operational	100	359	Wind	20	Tehachapi, CA
Shell Cabazon Wind	Operational	102	294	Wind	2	Palm Springs, CA
Whitewater Hill Wind	Operational	102	294	Wind	2	Palm Springs, CA

Source: CPUC 2015

Table 4.6-2
SDG&E Renewable Energy Projects Approved and in Development, March 2015

Projects Approved and Online	Status	Min MW	Min Expected GWh/yr	Technology	Contract Term (years)	Location	Online Date/ Contracted Delivery Date
MM Prima Deshecha Energy	On schedule	5	28	Biogas	15	San Juan Capistrano, CA	10/01/18
Imperial Solar Energy Center-West	Delayed	130	307	Solar PV	25	8 mi SW of El Centro, CA	10/15/13
Lan West (Soitec)	Delayed	7	13	Solar PV	25	Boulevard, CA	02/28/14
Desert Green (Soitec)	Delayed	7	13	Solar PV	25	Borrego Springs, CA	02/28/14
Lan East (Soitec)	Delayed	22	51	Solar PV	25	Boulevard, CA	10/31/14
Rugged (Soitec)	Delayed	80	203	Solar PV	25	Boulevard, CA	12/31/14
Tierra del Sol (Soitec)	Delayed	45	114	Solar PV	25	Boulevard, CA	12/31/14
Energia Sierra Juarez	Delayed	100	324	Wind	20	Jacume, Baja California Norte, MX	03/22/14
Seville Tallbear LLC	On schedule	20	59	Solar PV	20	Calipatria, CA	04/01/15
Calipatria	On schedule	20	48	Solar PV	20	Calipatria, CA	06/27/15

Source: CPUC 2015

4.6.2 REGULATORY SETTING

FEDERAL LAWS, REGULATIONS, PLANS, AND POLICIES

Energy Policy and Conservation Act of 1975

The Energy Policy and Conservation Act of 1975 established the first fuel economy standards for on-road motor vehicles sold in the United States. The National Highway Traffic and Safety Administration (NHTSA) is responsible for establishing vehicle standards and revising existing standards. The Corporate Average Fuel Economy (CAFE) program was created to determine vehicle manufacturers' compliance with the fuel economy standards. USEPA administers the testing program that generates the fuel economy data.

National Energy Act of 1978

The National Energy Act of 1978 included the Public Utility Regulatory Policies Act (Public Law 95-617), Energy Tax Act (Public Law 95-318), National Energy Conservation Policy Act (Public Law 95-619), Power Plant and Industrial Fuel Use Act (Public Law 95-620), and the Natural Gas Policy Act (Public Law 95-621).

The intent of the National Energy Act was to promote greater use of renewable energy, provide residential consumers with energy conservation audits to encourage slower growth of electricity demand, and promote fuel efficiency. The Public Utility Regulatory Policies Act created a market for nonutility electric power producers to permit independent power producers to connect to their lines and to pay for the electricity that was delivered.

The Energy Tax Act promoted fuel efficiency and renewable energy through taxes and tax credits. The National Energy Conservation Policy Act required utilities to provide residential consumers with energy conservation audits and other services to encourage slower growth of electricity demand.

Energy Policy Acts

The Energy Policy Act of 1992 (EPAct) was developed to reduce dependence on imported petroleum and improve air quality by addressing all aspects of energy supply and demand, including alternative fuels, renewable energy, and energy efficiency. EPAct requires certain federal, state, and local government and private fleets to purchase alternative fuel vehicles. The act also includes definitions for "alternative fuels," and includes fuels such as ethanol, natural gas, propane, hydrogen, electricity, and biodiesel.

The Energy Policy Act of 2005 was signed into law on August 8, 2005. The Energy Policy Act set federal energy management requirements for energy-efficient product procurement, energy savings performance contracts, building performance standards, renewable energy requirements, and alternative fuel use. The Energy Policy Act also amends existing regulations, including fuel economy testing procedures.

Energy Independence and Security Act of 2007

Signed into law in December 2007, the Energy Independence and Security Act was passed to increase the production of clean renewable fuels; increase the efficiency of products, buildings, and vehicles; improve the energy performance of the federal government; and increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy. The Energy Independence and Security Act included the first increase in fuel economy standards for passenger cars since 1975. The act also included a new energy grant program for use by local governments in implementing energy-efficiency initiatives, as well as a variety of green building incentives and programs.

Executive Order 13514

On October 5, 2009, the President signed Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance (3 CFR 13514). The Executive Order set sustainability goals for federal agencies and focuses on making improvements in their environmental, energy, and economic performance. The Executive Order requires agencies to meet a number of energy, water, and waste reduction targets, including:

- 30 percent reduction in vehicle fleet petroleum use by 2020;
- 26 percent improvement in water efficiency by 2020;
- 50 percent recycling and waste diversion by 2015;
- 95 percent of all applicable contracts will meet sustainability requirements;
- Implementation of the 2030 net-zero-energy building requirement;
- Implementation of the stormwater provisions of the Energy Independence and Security Act of 2007, section 438; and
- Development of guidance for sustainable federal building locations in alignment with the Livability Principles put forward by the Department of Housing and Urban Development, DOT, and USEPA.

Executive Order 13693

On March 19, 2015, the President signed Executive Order 13693, Planning for Federal Sustainability in the Next Decade. The Executive Order sets a goal of reducing Federal agency GHG emissions by 40 percent over the next decade. The Executive Order sets agency GHG reduction targets and sustainability goals, including:

- Percentage reduction targets must be proposed by each Federal agency, including FHWA, FTA, and FRA, for agency-wide GHG emissions reductions by the end of fiscal year 2025 relative to a fiscal year 2008 baseline.

- Sustainability goals for each Federal agency, including:

    - Promoting building energy conservation, efficiency, and management;
    - Requiring the use of renewable and alternative energy for electric and thermal energy in Federal buildings by up to 25 percent by fiscal year 2025;
    - Requiring the use of renewable and alternative energy for total building energy consumption in Federal buildings by up to 30 percent by fiscal year 2025;
    - Improving Federal agency water efficiency and management to reduce water consumption by 36 percent by fiscal year 2025;
    - Improving Federal agency vehicle fleet efficiency and management to reduce GHG emissions by 30 percent by fiscal year 2025;
    - Promoting sustainable acquisition and procurement practices; and
    - Advancing waste prevention and pollution prevention by diverting at least 50 percent of non-hazardous solid waste.

STATE LAWS, REGULATIONS, PLANS, AND POLICIES

California Energy Commission Plans and Programs

The CEC is the state's primary energy policy and planning agency. The CEC collects and analyzes energy-related data, prepares statewide energy policy recommendations and plans, promotes and funds energy efficiency programs, and adopts and enforces appliance and building energy efficiency standards. The CEC has five major responsibilities: (1) forecasting future energy needs and keeping historical energy data, (2) licensing thermal power plants 50 MW or larger, (3) promoting energy efficiency through appliance and building standards, (4) developing energy technologies and supporting renewable energy, and (5) planning for and directing the state response to an energy emergency.

Last updated in 2008, the State of California Energy Action Plan establishes goals and specific actions to ensure adequate, reliable, and reasonably priced electrical power and natural gas supplies, initiatives for increasing supply and reducing demand, in the context of global climate change (CEC 2008).

The CEC conducts assessments and forecasts of all aspects of energy industry supply, production, transportation, delivery, and distribution, The CEC adopts the Integrated Energy Policy Report (IEPR) every 2 years and an update every other year. The 2014 IEPR is the most recent report and provides a summary of energy issues, outlining strategies and recommendations to further California's goal of ensuring reliable, affordable, and environmentally responsible energy sources (CEC 2015).

California Public Utilities Commission

The CPUC has authority to set electric rates, regulate natural gas utility service, protect consumers, promote energy efficiency, and ensure electric system reliability. The California electricity market, regulated by the CPUC, serves 11.5 million customers with 32,698 miles of transmission lines and 239,112 miles of distribution lines for a total economic value of $23.7 billion (CPUC 2013).

The CPUC has established rules for the planning and construction of new transmission facilities, distribution facilities, and substations. Utility companies are required to obtain permits to construct certain power line facilities or substations. The CPUC also has jurisdiction over the siting of natural gas transmission lines.

The CPUC regulates distributed generation policies and programs for both customers and utilities. This includes incentive programs (e.g., California Solar Initiative) and net energy metering policies. Net energy metering allows customers to receive a financial credit for power generated by their on-site system and fed back to the utility. The CPUC is involved with utilities through a variety of energy procurement programs, including the Renewable Portfolio Standard program.

In 2008, the CPUC adopted the Long Term Energy Efficiency Strategic Plan, which is the roadmap to achieving maximum energy savings in California through 2020 (CPUC 2008). Consistent with California's energy policy and electricity "loading order," the Energy Efficiency Strategic Plan indicates that energy efficiency is the highest priority resource in meeting California's energy needs. The CPUC also adopted energy goals that require all new residential construction in California to be zero net energy (ZNE) by 2020. The ZNE goal means new buildings must use a combination of improved efficiency and distributed renewable energy generation to meet 100 percent of their annual energy need (CEC 2012). In addition to the ZNE goals for residential buildings by 2020, the CPUC has adopted goals that all new commercial construction in California will be ZNE by 2030 and 50 percent of existing commercial buildings will be retrofit to ZNE by 2030.

Renewable Portfolio Standard

California law (SB X1-2, Statutes of 2011) requires retail suppliers of electricity to procure at least 33 percent of annual retail sales from eligible renewable energy sources by 2020.

Performance Standard for Baseload Power Generation

SB 1368 (Chapter 598, Statutes of 2006) required the CPUC to establish a GHG emissions performance standard for "baseload" generation from investor-owned utilities of 1,100 lbs CO_2/MWh. The CEC established a similar standard for local publicly owned utilities. All electricity provided to California, including imported electricity, must be generated from plants that meet or exceed this standard.

Senate Bill 1 (Chapter 132, Statutes of 2006)

The California Solar Initiative (Senate Bill 1, Chapter 132, Statutes of 2006), also known as the "Million Solar Roofs" legislation, set a goal of installing 3,000 megawatts of new solar capacity by 2017.

Title 24 Energy Standards

Energy Conservation Standards for new residential and nonresidential buildings were first adopted by the CEC in June 1977 and were most recently revised in 2013 (Title 24, Part 6 of the California Code of Regulations [Title 24]). Title 24 governs energy consumed by commercial and residential buildings in California. This includes the heating, ventilation, and air conditioning (HVAC) system; water heating; and some fixed lighting. Nonbuilding energy use, or "plug-in" energy use, is not covered by Title 24. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods. California's Building Energy Efficiency Standards are updated on an approximate 3-year cycle. The most recent update was in 2013. The 2013 Title 24 standards went into effect July 1, 2014, and improve on the 2008 Title 24 standards. The CEC estimates that the 2013 Standards are 25 percent more energy-efficient than the previous standards for residential construction and 30 percent more efficient for nonresidential construction (CEC 2014a, 2014b).

Appliance Efficiency Regulations

California's 2009 Appliance Efficiency Regulations (20 CCR 1601–1608) were adopted by the CEC on December 3, 2008, and approved by the California Office of Administrative Law on July 10, 2009. The regulations include standards for both federally regulated appliances and nonfederally regulated appliances.

Green Building Standards

The 2013 California Green Building Standards Code (24 CCR Part 11 [CALGREEN]) took effect January 1, 2014. These comprehensive regulations will achieve major reductions in GHG emissions, energy consumption, and water use. CALGREEN will require that every new building constructed in California reduce water consumption by 20 percent, divert 50 percent of construction waste from landfills, and install low-pollutant-emitting materials. They also require separate water meters for nonresidential buildings' indoor and outdoor water use, with a requirement for moisture-sensing irrigation systems for larger landscape projects and mandatory inspections of energy systems (e.g., heat furnace, air conditioner, and mechanical equipment) for nonresidential buildings larger than 10,000 square feet to ensure that all are working at their maximum capacity and according to their design efficiencies. ARB estimates that the mandatory provisions will reduce GHG emissions from buildings by approximately 3 MMT CO_2e in 2020 in comparison with GHG emissions without implementation of the Green Building Standards (ARB 2014e).

Executive Order B-18-12

Executive Order B-18-12 orders all new state buildings and major renovations beginning design after 2025 be constructed as ZNE facilities. The Executive Order sets an interim target for 50 percent of new facilities beginning design after 2020 to be ZNE. It directs state agencies to take measures toward achieving ZNE for 50 percent of the square footage of existing state-owned building area by 2025.

ARB Advanced Clean Cars Program/Zero Emission Vehicle Program

Assembly Bill (AB) 1493 (Chapter 200, Statutes of 2002), also known as the Pavley regulations, required ARB to adopt regulations by January 1, 2005, that would result in the achievement of the "maximum feasible" reduction in GHG emissions from vehicles used in the state primarily for noncommercial, personal transportation.

In January 2012, ARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single package of standards called Advanced Clean Cars (13 CCR 1962.1 and 1962.2). The Advanced Clean Cars requirements include new GHG standards for model year 2017 to 2025 vehicles. ARB anticipates that the new standards will reduce motor vehicle GHG emissions by 34 percent in 2025 (ARB 2014a).

The Advanced Clean Cars Program also includes the LEV III amendments to the LEV regulations (13 CCR 1900 et seq.), Zero Emission Vehicle Program and the Clean Fuels Outlet Regulation. The Zero Emission Vehicle Program is designed to achieve California's long-term emission reduction goals by requiring manufacturers to offer for sale specific numbers of the very cleanest cars available. These zero-emission vehicles, which include battery electric, fuel cell, and plug-in hybrid electric vehicles, are just beginning to enter the marketplace. They are expected to be fully commercial by 2020. Most vehicle manufacturers agree that providing a selection of these technologies will be necessary to meet climate goals by 2050 (ARB 2014b). The Clean Fuels Outlet regulation ensures that fuels such as electricity and hydrogen are available to meet the fueling needs of the new advanced technology vehicles as they come to market.

Executive Order B-16-12

Executive Order B-16-12 orders State entities under the direction of the Governor including ARB, the Energy Commission, and Public Utilities Commission to support the rapid commercialization of zero emission vehicles (ZEVs). It directs these entities to achieve various benchmarks related to zero emission vehicles, including:

- Infrastructure to support up to one million zero emission vehicles by 2020,
- Widespread use of zero emission vehicles for public transportation and freight transport by 2020,
- Over 1.5 million zero emission vehicles on California roads by 2025,
- Annual displacement of at least 1.5 billion gallons of petroleum fuels by 2025, and
- A reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels by 2050.

It also sets a state GHG emissions reduction target for the transportation sector of 80 percent below 1990 levels by 2050.

Executive Order S-01-07 (Low Carbon Fuel Standard)

Executive Order S-01-07 (17 CCR 95480 et seq.) requires the state to achieve a 10 percent or greater reduction by 2020 in the average fuel carbon intensity for transportation fuels in California regulated by ARB. ARB identified the Low Carbon Fuel Standard (LCFS) as a discrete early action item under AB 32, and the final ARB resolution (No. 09-31) adopting the LCFS was issued on April 23, 2009. ARB is currently considering amendments to the LCFS and plans to consider re-adoption of the LCFS in 2015.

Public Resources Code Section 30253

Public Resources Code Section 30253, part 4, establishes a policy that development within the Coastal Zone shall minimize energy consumption and vehicle miles traveled.

REGIONAL AND LOCAL LAWS, REGULATIONS, PLANS, AND POLICIES

SANDAG Climate Action Strategy

In 2010, SANDAG published a Climate Action Strategy (Strategy) that was prepared under a partnership with the CEC (SANDAG 2010). The Strategy is a guidance document and not a binding plan. The Strategy serves as a guide to help policymakers address climate change as they make decisions to meet the needs of our growing population, maintain and enhance our quality of life, and promote economic stability. As stated in the Strategy introduction, the policy measures contained in the Strategy are intended to be a list of potential options (tools in the toolbox) for consideration as SANDAG and local governments update their various plans. The policy measures are not requirements for SANDAG, local governments, or any other entity.

The Strategy identifies goals, objectives, and policy measures in the areas of transportation, land use, buildings, and energy use. Also addressed are measures and resources to help local governments reduce emissions from their operations and in their communities. The policy measures contained in this document are intended to be a list of potential options to reduce GHG emissions. Because local governments have greater control over some categories of GHG emission sources, the Strategy emphasizes those areas where the greatest impact can be made at the local and regional level. These areas include land use patterns, transportation infrastructure, and related public investment; building construction and energy use; and local government operations.

Within the three areas, goals, objectives, and policy measures are included in the Strategy to further describe how GHG emissions reductions could be achieved. The goals identified in the Strategy include the following:

Transportation Sector

- Reduce total miles of vehicle travel
- Minimize GHG emissions when vehicles are used
- Support increased use of low carbon alternative fuels
- Protect transportation infrastructure from climate change impacts

Clean Energy and Efficient Buildings

- Reduce energy use in residential and commercial buildings
- Increase use of renewable energy
- Reduce water-related energy use and GHGs
- Protect energy infrastructure from climate change impacts

SANDAG and Local Government Operations

- SANDAG and local governments lead by example

SANDAG Regional Energy Strategy

The Regional Energy Strategy (RES) serves as an energy policy guide to support decision-making by SANDAG and its member agencies. The 2014 RES updates SANDAG energy strategies adopted in 1994, 2003, and 2009. The RES is structured around 11 major energy topics, such as energy efficiency and conservation, renewable energy, transportation fuels, and land use and transportation planning.

In 2014, the RES was updated to reflect progress toward RES goals and account for changes in energy and climate change policy since 2009. In addition, progress summary reports were prepared for each of the 11 goals. The RES assesses the regional need for energy resources and infrastructure but does not make recommendations for specific energy projects. The RES focuses on opportunities that SANDAG and its member agencies could take to address energy issues and achieve both local and regional goals related to energy and climate change. The information in the RES was used to develop goals and policies in the proposed Plan.

Regional Alternative Fuel Planning

In 2009, SANDAG developed the Regional Alternative Fuels, Vehicles and Infrastructure Report, which is an assessment on how to accelerate deployment of alternative fuel vehicles in and around San Diego (SANDAG 2009). The objectives of the report are to (1) help local governments and other regional stakeholders make informed decisions regarding appropriate alternative fuel technologies, and (2) identify and recommend regional and local government actions that can initially support local alternative fuel fleets and eventually support alternative fuel use by the general public. The report also includes recommendations for alternative fuels and project types. Electricity and natural gas are the top priorities for passenger vehicles, while biodiesel, natural gas, propane, and hybrid technologies are recommended for medium- and heavy-duty vehicles. The report recommends further study of transit stations along -rapid bus transit routes, integrating electric charging station siting with the regional transportation network, and truck stop electrification.

San Diego Regional Plug-In Electric Vehicle Readiness Plan

In 2012, SANDAG established the San Diego Regional Electric Vehicle Infrastructure Working Group (REVI) as part of a CEC grant to perform regional Plug-In Electric Vehicle (PEV) readiness planning. The REVI completed the San Diego Regional Plug-in Electric Vehicle Readiness Plan, which was accepted by the SANDAG Board in January 2014. As part of another CEC grant, SANDAG will build on the success of the REVI and undertake regional readiness planning for all alternative fuels in partnership with the San Diego Regional Clean Cities Coalition. A regional alternative fuels coordinating council will be established to advise on regional alternative fuel infrastructure needs, barriers, and solutions.

SANDAG Energy Roadmap Program for Local Governments

SANDAG and SDG&E provide free energy assessments and energy management plans to SANDAG member agencies. This Energy Roadmap Program was established in 2010 and provides a framework for local governments to reduce energy use. The goals of the program include categories such as saving Energy in City Buildings and Facilities, demonstrating Emerging Energy Technologies, and greening the City Vehicle Fleet. SANDAG assists member agencies in developing projects and programs to reduce government spending on utility bills and integrate sustainability, energy efficiency, and emission reductions into general plans.

Local General Plans

Many of the local agencies in the San Diego region have general plan goals, objectives, and policies that specifically address energy use and conservation. The policies set forth in local general plans would have an effect on energy conservation in the development of new structures and communities within the proposed Plan area.

These goals and policies include improvements in energy efficiency for new residential and commercial land uses and measures to reduce VMT through land use and transportation planning. Measures included in the general plans would improve energy efficiency and minimize wasteful, inefficient energy consumption in the project area. As a result of requirements, incentive programs, and educational and outreach programs, general plans would build on federal and state efforts to improve energy efficiency associated with future land uses and transportation projects.

Climate Action Plans

As discussed in more detail in Section 4.8, Greenhouse Gas, Climate Action Plans (CAPs) are developed to identify the nature of GHG emissions and to implement policies, actions, and measures to reduce existing and future GHG emissions. All 18 cities and the County of San Diego have completed a GHG inventory, many prepared as part of the San Diego Foundation's Climate Initiative. A GHG inventory is the first step toward preparing a CAP. A CAP provides measures for reducing emissions through policies similar to those in the proposed Plan, such as by encouraging building retrofits or mandating an energy efficiency code in new construction. Many jurisdictions have adopted or are currently preparing CAPs, such as the City of Chula Vista, City of Encinitas, City of San Diego, City of National City, and County of San Diego. More than half of the local jurisdictions in the San Diego region, representing over 75 percent of the region's population, are developing or have adopted a CAP (City of Chula Vista 2000, 2008, 2013; City of Encinitas 2011; City of Escondido 2013; City of National City 2011; City of San Diego 2005; City of San Marcos 2013; County of San Diego 2012; City of Vista 2012). Section 4.8, Greenhouse Gas Emissions, includes Table 4.8-3 that summarizes each jurisdiction's climate planning efforts. In addition to the efforts of the 18 cities and the County of San Diego, the Port of San Diego and the San Diego County Water Authority have developed GHG inventories and CAPs.

4.6.3 SIGNIFICANCE CRITERIA

Appendix F of the CEQA Guidelines provides a list of six environmental impacts related to use of energy in Section II (c). Unless otherwise noted, the significance criteria developed for this EIR are based on that list of environmental impacts provided in Appendix F. SANDAG has consolidated the list and edited the wording in an effort to develop significance criteria that reflect the programmatic level of analysis in this EIR and the unique nature of the proposed Plan.

Specifically, CEQA Appendix F criterion (C)(1) addresses a project's energy use requirements and energy use efficiency by amount and fuel type, and criterion (C)(2) addresses a project's effects on local and regional energy supplies. These criteria have been combined and modified in EN-1. Criteria (C)(3) and (C)(4), related to energy demand and standards, respectively, are aligned with EN-2. EN-3 addresses the effects of the project on energy resources consistent with criterion (C)(5). For the purposes of this EIR, implementation of the proposed Plan would have a significant impact if it would:

EN-1 Result in an increase in overall per capita energy consumption relative to baseline conditions, or otherwise use energy in an inefficient, wasteful, or unnecessary manner.

EN-2 Result in an increased reliance on fossil fuels and decreased reliance on renewable energy sources.

EN-3 Require or result in the construction of new energy facilities or the expansion of such facilities to adequately meet projected demands, the construction of which could cause a significant environmental effect.

4.6.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

EN-1 RESULT IN AN INCREASE IN OVERALL PER CAPITA ENERGY CONSUMPTION RELATIVE TO BASELINE CONDITIONS, OR OTHERWISE USE ENERGY IN AN INEFFICIENT, WASTEFUL, OR UNNECESSARY MANNER.

ANALYSIS METHODOLOGY

Energy would be consumed during both construction and operation of the proposed Plan. Construction energy use for regional growth and land use change was estimated for 2020, 2035, and 2050 and compared to the baseline year (2012). Energy consumption from off-road equipment was used to estimate energy consumed during construction activity associated with regional growth and land use change. Construction activity uses energy through the use of off-road construction equipment, on-road construction vehicles, and worker commute vehicles, as well as the use of electricity for temporary buildings, lighting, and other sources. Energy consumption estimates for on-road construction vehicles and worker commute vehicles are included in operational estimates for transportation network improvements and programs. The use of electricity for temporary buildings, lighting, and other sources is estimated as part of operational energy consumption for regional growth and land use change.

The off-road category includes construction equipment, as well as mining equipment, industrial equipment, recreational equipment, and other equipment not directly related to construction activities (see Appendix G to this EIR). Therefore, the use of the off-road equipment category likely overestimates the amount of fuel consumption that would result from construction activities associated with regional growth and land use change. Estimates of operational electricity consumption and natural gas use developed as part of the regional GHG inventory were used for the analysis of regional growth and land use change (see Appendix G to this EIR).

Construction and operational energy use for transportation network improvements and programs was also estimated for 2020, 2035, and 2050 and compared to the baseline year (2012). Gasoline and diesel fuel consumption associated with operation of the transportation network, including passenger cars, light-duty trucks, medium and heavy duty trucks, and buses, was calculated using ARB's EMFAC2014 model. The revised numbers for gasoline and fuel consumption associated with operation of the transportation network reflect the minor modifications to the project description and the new version of EMFAC2014 (v1.0.7) released by ARB in May 2015. On-road GHG emissions in the Draft EIR were calculated using EMFAC2014 (v1.0.1). Diesel used by heavy rail, including the COASTER, AMTRAK, SPRINTER, and freight, is not included in these estimates, and would add small additional increases. Electricity and natural gas consumption associated with transportation network improvements is included under electricity use under regional growth and land use change.

Consistent with Appendix F to the CEQA Guidelines, a per capita analysis is appropriate for the proposed Plan, since that analysis would determine whether the energy use under the proposed Plan is more efficient relative to 2012. The analysis combines electricity, natural gas, and fuel consumption into a common unit of energy usage, Btu.

A Btu is a traditional unit of energy that is the amount of energy needed to cool or heat one pound of water by one degree Fahrenheit. This analysis compares existing per capita energy consumption (Btus) in 2012 with per capita consumption (Btus) in 2020, 2035, and 2050 under the proposed Plan.

During the timeframe of the proposed Plan, climate change effects that are likely to exacerbate the proposed Plan's impacts on energy consumption include, but are not limited to, higher annual average temperatures, more days of extreme high temperatures, longer and more humid heat waves, less frequent and more intense rainstorms and more frequent flood events, more intense and more frequent drought, increased evaporation from soil and reservoirs. In general, these climate change effects would increase between 2020 and 2050. Climate change effects on energy consumption in the San Diego region are discussed in more detail in Appendix F to this EIR.

2020

Regional Growth and Land Use Change and Transportation Network Improvements and Programs

As shown in Table 4.6-3, total energy use would decrease under implementation of the proposed Plan from approximately 3332 trillion Btu to 3103 trillion Btu from 2012 to 2020, a decrease of about 7 percent. During the same time, the regional population is forecasted to increase by 289,284 people, an increase of about 9 percent. As a result, per capita energy use would decrease by about 145 percent from 2012 to 2020.

Table 4.6-3
Total and Per Capita Energy Use under the Proposed Plan, 2012 and 2020

Category	2012		2020	
	Energy Use	Trillion Btu	Energy Use	Trillion Btu
Regional Growth and Land Use Change	**--**	**120**	**--**	**122**
Electricity (Gwh)	19,737	67	20,175	69
Natural Gas (million therms)	522	52	532	53
Transportation Network Improvements and Programs	**--**	**2010**	**--**	**1765**
Gasoline (million gallons)	1,4567	1832	1,2380	1554
Diesel (million gallons)	128	18	15260	21
Total Construction (million gallons)	**90**	**12**	**93**	**13**
Total Energy Use		**3332**		**3110**
Per Capita Energy Use (MMBtu/person)		**106**		**910**
Total Energy Use, Net Change 2012 to 2020				**-7%**
Per Capita Energy Use, Net Change 2012 to 2020				**-145%**

Source: Appendix G to the EIR.
Notes: 2012 population: 3,146,429; 2020 population: 3,435,713
The revised numbers in this table reflect the minor modifications to the project description and the new version of EMFAC2014 (v1.0.7) released by ARB in May 2015. On-road GHG emissions in the Draft EIR were calculated using EMFAC2014 (v1.0.1).
1 kWh = 3,412 Btu
1 therm = 100,000 Btu
1 gallon, gasoline = 125,000 Btu
1 gallon, diesel = 138,000 Btu

The decrease in total and per capita energy use is due in part to regulations and programs implemented on the state and regional levels to reduce energy use and emissions of GHGs. These programs include implementation of the RPS, Advanced Clean Cars regulations, the Low Carbon Fuel Standard, Cap-and-Trade program, energy efficiency standards for buildings, continued growth in solar photovoltaic installations, water conservation measures, and emission standards for off-road equipment.

In addition, the SCS land use pattern and transportation network improvements and programs have an important role in reducing per capita energy use because they decrease per capita vehicle miles traveled. The decrease in per capita VMT is attributable to a number of factors considered in the proposed Plan's transportation modeling: proposed Plan investments in transit and managed lanes; TDM programs such as carpooling, vanpooling, mobility hubs, and teleworking; and demographic (e.g., aging population) and economic e.g., fuel prices factors.

Also, more than 80 percent of housing growth under the proposed Plan would be multi-family development. Due to space efficiency, multi-family units are more efficient on a per unit basis in terms of electricity and natural gas consumption. This impact is less than significant.

2020 Conclusion

Implementation of regional growth and land use change and transportation network improvements and program would not result in an increase in overall per capita energy consumption, or otherwise use energy in an inefficient, wasteful, or unnecessary manner, because per capita energy use would decrease by approximately 1~~4~~5 percent from 2012 to 2020. Therefore, this impact (EN-1) in the year 2020 is less than significant.

2035

Regional Growth and Land Use Change and Transportation Network Improvements

As shown in Table 4.6-4, total energy use would decrease under implementation of the proposed Plan from approximately 33~~3~~2 trillion Btu to 28~~0~~73 trillion Btu from 2012 to 2035, a decrease of about 1~~6~~8 percent. During the same time, the regional population is forecasted to increase by 707,269 people, an increase of about 22 percent. As a result, per capita energy use would decrease by about 3~~1~~3 percent from 2012 to 2035.

The decrease in total and per capita energy use is due in part to regulations and programs implemented on the state and regional levels to reduce energy use and emissions of GHGs. These programs include implementation of the RPS, Advanced Clean Cars regulations, the Low Carbon Fuel Standard, Cap-and-Trade program, energy efficiency standards for buildings, continued growth in solar photovoltaic installations, water conservation measures, and emission standards for off-road equipment.

In addition, the SCS land use pattern and transportation network improvements and programs have an important role in reducing per capita energy use because they decrease per capita vehicle miles traveled. The decrease in per capita VMT is attributable to a number of factors considered in the proposed Plan's transportation modeling: proposed Plan investments in transit and managed lanes; TDM programs such as carpooling, vanpooling, mobility hubs, and teleworking; and demographic (e.g., aging population) and economic e.g., fuel prices factors.

Table 4.6-4
Total and Per Capita Energy Use under the Proposed Plan, 2012 and 2035

Category	2012		2035	
	Energy Use	Trillion Btu	Energy Use	Trillion Btu
Regional Growth and Land Use Change	--	**120**	--	**129**
Electricity (Gwh)	19,737	67	20,954	71
Natural Gas (million therms)	522	52	581	58
Transportation Network Improvements and Programs	--	**2010**	--	**~~124~~131**
Gasoline (million gallons)	1,4~~5~~67	183~~2~~	~~784~~842	~~98~~105
Diesel (million gallons)	128	18	189~~8~~	26
Total Construction (million gallons)	**90**	**12**	**144**	**20**
Total Energy Use	--	**333~~2~~**	--	**280~~73~~**
Per Capita Energy Use (MMBtu/person)		**106**		**7~~3~~1**
Total Energy Use, Net Change 2012 to 2035				**-16~~8~~%**
Per Capita Energy Use, Net Change 2012 to 2035				**-31~~3~~%**

Source: Appendix G to the EIR.
Notes: 2012 population: 3,146,429; 2035 population: 3,853,698
The revised numbers in this table reflect the minor modifications to the project description and the new version of EMFAC2014 (v1.0.7) released by ARB in May 2015. On-road GHG emissions in the Draft EIR were calculated using EMFAC2014 (v1.0.1).
1 kWh = 3,412 Btu
1 therm = 100,000 Btu
1 gallon, gasoline = 125,000 Btu
1 gallon, diesel = 138,000 Btu

The decrease in total and per capita energy use is due in part to regulations and programs implemented on the state and regional levels to reduce energy use and emissions of GHGs. These programs include implementation of the RPS, Advanced Clean Cars regulations, the Low Carbon Fuel Standard, Cap-and-Trade program, energy efficiency standards for buildings, continued growth in solar photovoltaic installations, water conservation measures, and emission standards for off-road equipment.

In addition, the SCS land use pattern and transportation network improvements and programs have an important role in reducing per capita energy use because they decrease per capita vehicle miles traveled. The decrease in per capita VMT is attributable to a number of factors considered in the proposed Plan's transportation modeling: proposed Plan investments in transit and managed lanes; TDM programs such as carpooling, vanpooling, mobility hubs, and teleworking; and demographic (e.g., aging population) and economic e.g., fuel prices factors.

Also, more than 80 percent of housing growth under the proposed Plan would be multi-family development. Due to space efficiency, multi-family units are more efficient on a per unit basis in terms of electricity and natural gas consumption. This impact is less than significant.

2035 Conclusion

Implementation of regional growth and land use change and transportation network improvements and program would not result in an increase in overall per capita energy consumption, or otherwise use energy in an inefficient, wasteful, or unnecessary manner, because per capita energy use would decrease by approximately 31~~3~~ percent from 2012 to 2035. Therefore, this impact (EN-1) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change and Transportation Network Improvements

As shown in Table 4.6-5, total energy use would decrease under implementation of the proposed Plan from approximately 33~~32~~ trillion Btu to ~~310~~ 293 trillion Btu from 2012 to ~~2035~~2050, a decrease of about ~~7~~ 12 percent. During the same time, the regional population is forecasted to increase by 925,330 people, an increase of about 29 percent. As a result, per capita energy use would decrease by about 3~~2~~4 percent from 2012 to 2050.

Table 4.6-5
Total and Per Capita Energy Use under the Proposed Plan, 2012 and 2050

Category	2012		2050	
	Energy Use	Trillion Btu	Energy Use	Trillion Btu
Regional Growth and Land Use Change	--	**120**	--	**137**
Electricity (Gwh)	19,737	67	21,767	74
Natural Gas (million therms)	522	52	631	63
Transportation Network Improvements and Programs	--	**2010**	--	**13224**
Gasoline (million gallons)	1,4567	1832	756827	94103
Diesel (million gallons)	128	18	213	29
Total Construction (million gallons)	**90**	**12**	**175**	**24**
Total Energy Use	--	**3332**		**29385**
Per Capita Energy Use (MMBtu/person)		**106**		**720**
Total Energy Use, Net Change 2012 to 2050				**-124%**
Per Capita Energy Use, Net Change 2012 to 2050				**-324%**

Source: Appendix G to the EIR.
Notes: 2012 population: 3,146,429; 2050 population: 4,068,759
The revised numbers in this table reflect the minor modifications to the project description and the new version of EMFAC2014 (v1.0.7) released by ARB in May 2015. On-road GHG emissions in the Draft EIR were calculated using EMFAC2014 (v1.0.1).
1 kWh = 3,412 Btu
1 therm = 100,000 Btu
1 gallon, gasoline = 125,000 Btu
1 gallon, diesel = 138,000 Btu

The decrease in total and per capita energy use is due in part to regulations and programs implemented on the state and regional levels to reduce energy use and emissions of GHGs. These programs include implementation of the RPS, Advanced Clean Cars regulations, the Low Carbon Fuel Standard, Cap-and-Trade program, energy efficiency standards for buildings, continued growth in solar photovoltaic installations, water conservation measures, solid waste diversion, and emission standards for off-road equipment.

In addition, the SCS land use pattern and transportation network improvements and programs have an important role in reducing per capita energy use because they decrease per capita vehicle miles traveled. The decrease in per capita VMT is attributable to a number of factors considered in the proposed Plan's transportation modeling: proposed Plan investments in transit and managed lanes; TDM programs such as carpooling, vanpooling, mobility hubs, and teleworking; and demographic (e.g., aging population) and economic e.g., fuel prices factors.

Also, more than 80 percent of housing growth under the proposed Plan would be multi-family development. Due to space efficiency, multi-family units are more efficient on a per unit basis in terms of electricity and natural gas consumption. This impact is less than significant.

2050 Conclusion

Implementation of regional growth and land use change and transportation network improvements and program would not result in an increase in overall per capita energy consumption, or otherwise use energy in an inefficient, wasteful, or unnecessary manner, because per capita energy use would decrease by approximately 324 percent from 2012 to 2050. Therefore, this impact (EN-1) in the year 2050 is less than significant.

EN-2 RESULT IN AN INCREASED RELIANCE ON FOSSIL FUELS AND DECREASED RELIANCE ON RENEWABLE ENERGY SOURCES.

ANALYSIS METHODOLOGY

This analysis uses the existing and total energy use projections from Impact EN-1 to evaluate whether the implementation of the proposed Plan would increase reliance on fossil fuels and decrease reliance on renewable energy sources. The analysis separately considers fossil fuel and renewable energy reliance for regional growth and land use change and transportation network improvements and programs. Also provided is a qualitative evaluation of how adopted state and regional regulations and programs would contribute to reliance on fossil fuels and renewable energy sources under implementation of the proposed Plan.

During the timeframe of the proposed Plan, climate change effects that are likely to exacerbate the proposed Plan's impacts on energy consumption include, but are not limited to, higher annual average temperatures, more days of extreme high temperatures, longer and more humid heat waves, less frequent and more intense rainstorms and more frequent flood events, and more intense and more frequent drought. In general, these climate change effects would increase between 2020 and 2050. Climate change effects on energy consumption in the San Diego region are discussed in more detail in Appendix F to this EIR.

2020

Regional Growth and Land Use Change

As shown in Table 4.6-3 under Impact EN-1, total energy use associated with regional growth and land use change would increase by about 2 percent from 2012 to 2020. However, as explained below, there would be decreased reliance on fossil fuels and increased reliance on renewable energy sources by 2020 relative to 2012. Impact EN-1 describes state and regional regulations and programs that would reduce per capita energy use; the same regulations and programs would also decrease reliance on fossil fuels and increase reliance on renewable energy. These include the Renewable Portfolio Standard, Title 24, Appliance Efficiency Regulations, Green Building Standards, water conservation measures, and continued growth in solar photovoltaic installations.

In 2013, SDG&E produced 23.6 percent of its energy from renewable sources (CPUC 2015). This would increase to 33 percent by 2020. In addition, more than 80 percent of housing growth under the proposed Plan would be multi-family development. Due to space efficiency, multi-family units are more efficient on a per unit basis in terms of electricity and natural gas consumption. Moreover, Title 24 standards are updated on an approximately three-year cycle, and new standards will continue to improve upon the current 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2016 Title 24 Standards will go into effect on January 1, 2017, and would likely contribute to further reductions in reliance on fossil fuel energy sources by requiring greater energy efficiency relative to the adopted 2013 standards. The State's adopted energy goals require all new residential construction in California to be ZNE by 2020. The ZNE goal means new buildings must use a combination of improved efficiency and distributed renewable energy generation to meet 100 percent of their annual energy needs (CEC 2012). While there is no guarantee that this goal would be achieved by 2020, any progress toward this goal would further reduce the region's reliance on fossil fuels, and increase its reliance on renewable energy sources.

Distributed energy systems include small-scale power generation technologies such as PV, small wind turbines, and cogeneration systems located close to where energy is being used. The 2014 RES includes a goal to increase the total amount of clean distributed generation (renewable and non-renewable) to reduce peak demand and diversify electricity resources in the San Diego region (SANDAG 2014). The California Solar Initiative (Senate Bill 1), the availability of net metering (described below), and local measures to incentivize and/or streamline the permitting process for solar PV combined with reduced costs of installations have increased solar PV capacity in the San Diego region by three times from 2008 (49 MW) to 2013 (150 MW). During implementation of the proposed Plan, installations of solar PV are anticipated to continue to increase.

Net metering allows customers with onsite renewable energy system to earn credit for excess power they produce. As of March 2015, customers in SDG&E territory have installed 367 MW of net metered distributed generation, and SDG&E currently has a cap of 606 MW (5 percent of the aggregate customer peak demand). Therefore, an additional 240 MW can be installed in the San Diego Region.

Through the Energy Roadmap Program, SANDAG has developed energy management plans for local governments that identify opportunities to save energy in their own operations and in their larger communities. SANDAG assists member agencies in developing projects and programs to reduce government spending on utility bills and integrate sustainability, energy efficiency, and emission reductions into general plans. The Energy Roadmap Program would contribute to energy savings during implementation of the proposed Plan that reduce reliance on fossil fuels.

As discussed in more detail in Section 4.8, measures included in local CAPs and the SANDAG Climate Action Strategy related to energy efficiency, renewable energy, and distributed generation would further reduce reliance on fossil fuel sources of electricity generation and increase reliance on renewable resources during the implementation of the proposed Plan. Based on the above analysis, forecasted regional growth and land use change would not result in an increased reliance on fossil fuels and a decreased reliance on renewable energy sources. This impact is less than significant.

Transportation Network Improvements and Programs

As shown in Table 4.6-3 in Impact EN-1, total energy use under implementation of the proposed Plan from fossil fuels (gasoline and diesel) associated with transportation network improvements and programs would decrease by about 1~~2~~3 percent from 2012 to 2020.

Impact EN-1 describes state and regional regulations and programs that would reduce per capita energy use; the same regulations and programs would also decrease reliance on fossil fuels and increase reliance on renewable energy. These include Advanced Clean Cars regulations, zero emission vehicle regulations, the Low Carbon Fuel Standard, Cap-and-Trade program, and emission standards for off-road equipment. Specific measures include new vehicle efficiency standards and expansion of the ZEV Action Plan for medium- and heavy-duty ZEVs. Executive Order B-16-2012 set a long-term goal of 1.5 million ZEVs on California's roadways by 2025, including PEVs and hydrogen fuel-cell electric vehicles (FCEVs). Increased deployment of ZEVs would replace traditional gasoline and diesel-powered vehicles and therefore reduce reliance on fossil fuels in the transportation sector during implementation of the proposed Plan.

The CEC's Alternative and Renewable Fuel and Vehicle Technology Program (ARFVTP) was created in 2007 and is funded with up to $100 million annually. The ARFVTP was reauthorized in 2013 and extended program funding from 2016 to 2024. The ARFVTP has awarded funding for 18 projects in the San Diego Region for a total of $1.4 million, and another 26 projects totaling $12 million are pending approval (CEC 2013). The projects pending approval are primarily electric vehicle charging stations that would reduce dependence on fossil fuels, particularly when combined with overall increases in renewable energy sources as a result of the RPS requirements for the San Diego region.

In addition, the SCS land use pattern and transportation network improvements and programs play an important role in decreasing reliance on fossil fuel energy sources by decreasing per capita vehicle miles traveled. The decrease in per capita VMT is attributable to a number of factors considered in the proposed Plan's transportation modeling: proposed Plan investments in transit and managed lanes; TDM programs such as carpooling, vanpooling, mobility hubs, and teleworking; and demographic (e.g., aging population) and economic (e.g., fuel price factors).

Based on the above analysis, planned transportation network improvements and programs would not result in an increased reliance on fossil fuels and a decreased reliance on renewable energy sources. This impact is less than significant.

2020 Conclusion

Implementation of regional growth and land use change and planned transportation network improvements would not result in increased reliance on fossil fuels and decreased reliance on renewable energy sources because total energy use would decrease, fossil fuel energy consumption would decrease, and renewable energy consumption would increase. Therefore, this impact (EN-2) in the year 2020 is less than significant.

2035

Regional Growth and Land Use Change

As shown in Table 4.6-4 under Impact EN-1, total energy use associated with regional growth and land use change would increase by about 7.5 percent from 2012 to 2035. However, as explained below, there would not be increased reliance on fossil fuels and decreased reliance on renewable energy sources by 2035 relative to 2012.

Impact EN-1 describes state and regional regulations and programs that would reduce per capita energy use; the same regulations and programs would also decrease reliance on fossil fuels and increase reliance on renewable energy. These include the Renewable Portfolio Standard, Title 24, Appliance Efficiency Regulations, Green Building Standards, water conservation measures, and continued growth in solar photovoltaic installations. While the target years for these programs and regulations do not extend out to 2035, they would remain in effect at that time, and would continue to decrease reliance on fossil fuel energy sources and increase reliance on renewable energy sources. For example, while the percentage requirement of the adopted RPS does not extend beyond 2020, the same 33 percent requirement would continue to increase reliance on renewable energy as the overall amount of total electricity generated would increase by 2035. Similarly, existing requirements for more energy efficient appliances and buildings would continue to decrease fossil fuel reliance as they are applied to forecasted housing unit and nonresidential development under the proposed Plan. And while there is no guarantee that the State's goals for ZNE residential buildings by 2020 and ZNE commercial buildings by 2030 would be achieved by 2035, any progress toward this goal would further reduce the region's reliance on fossil fuels, and increase its reliance on renewable energy sources.

Based on the above analysis, the proposed Plan would not result in an increased reliance on fossil fuels and decreased reliance on renewable energy sources related to regional growth and land use changes. This impact is less than significant.

Transportation Network Improvements and Programs

As shown in Table 4.6-4 in Impact EN-1, total energy use under implementation of the proposed Plan from fossil fuels (gasoline and diesel) associated with transportation network improvements and programs would decrease by about 35~~8~~ percent from 2012 to 2035.

Impact EN-1 describes state and regional regulations and programs that would reduce per capita energy use; the same regulations and programs would also decrease reliance on fossil fuels and increase reliance on renewable energy. These include the Advanced Clean Cars regulations, zero emission vehicle regulations, the Low Carbon Fuel Standard, Cap-and-Trade program, and emission standards for off-road equipment. Specific measures include new vehicle efficiency standards and expansion of the ZEV Action Plan for medium- and heavy-duty ZEVs. Executive Order B-16-2012 set a long-term goal of 1.5 million ZEVs on California's roadways by 2025, including PEVs and hydrogen FCEVs. Increased deployment of ZEVs would replace traditional gasoline and diesel-powered vehicles and therefore reduce reliance on fossil fuels in the transportation sector during implementation of the proposed Plan. Fuel economy standards for passenger vehicles and light-duty trucks will become more stringent for model year 2017 to 2025 vehicles, which will continue to improve the overall fuel efficiency of the vehicle fleet as older vehicles are replaced with new ones that meet the more efficient standards.

The CEC's Alternative and Renewable Fuel and Vehicle Technology Program is funded through 2024 and would continue funding projects such as electric vehicle charging stations that would reduce dependence on fossil fuels, particularly when combined with overall increases in renewable energy sources as a result of the RPS requirements for the San Diego region.

In addition, the SCS land use pattern and transportation network improvements and programs play an important role in decreasing reliance on fossil fuel energy sources by decreasing per capita vehicle miles traveled. The decrease in per capita VMT is attributable to a number of factors considered in the proposed Plan's transportation modeling: proposed Plan investments in transit and managed lanes; TDM programs such as carpooling, vanpooling, mobility hubs, and teleworking; and demographic (e.g., aging population) and economic e.g., fuel prices factors.

Based on the above analysis, planned transportation network improvements and programs would not result in an increased reliance on fossil fuels and a decreased reliance on renewable energy sources. This impact is less than significant.

2035 Conclusion

Implementation of regional growth and land use change and planned transportation network improvements would not result in increased reliance on fossil fuels and decreased reliance on renewable energy sources because total energy use would decrease, fossil fuel energy consumption would decrease, and renewable energy consumption would increase. Therefore, this impact (EN-2) in the year 2035 is less than significant.

2050

Regional Growth and Land Use Change

As shown in Table 4.6-5 under Impact EN-1, total energy use associated with regional growth and land use change would increase by about 14 percent from 2012 to 2050. However, as explained below, there would not be increased reliance on fossil fuels and decreased reliance on renewable energy sources by 2050 relative to 2012.

Impact EN-1 describes state and regional regulations and programs that would reduce per capita energy use; the same regulations and programs would also decrease reliance on fossil fuels and increase reliance on renewable energy. These include the Renewable Portfolio Standard, Title 24, Appliance Efficiency Regulations, Green Building Standards, water conservation measures, and continued growth in solar photovoltaic installations. While the target years for these programs and regulations do not extend out to 2050, they would remain in effect at that time, and would continue to decrease reliance on fossil fuel energy sources and increase reliance on renewable energy sources. For example, while the percentage requirement of the adopted RPS does not extend beyond 2020, the same 33 percent requirement would continue to increase reliance on renewable energy as the overall amount of total electricity generated would increase by 2050. Similarly, existing requirements for more energy efficient appliances and buildings would continue to decrease fossil fuel reliance as they applied to forecasted housing unit and nonresidential development under the proposed Plan. And while there is no guarantee that the State's goals for ZNE residential buildings by 2020 and ZNE commercial buildings by 2030 would be achieved by 2050, any progress toward this goal would further reduce the region's reliance on fossil fuels, and increase its reliance on renewable energy sources.

Based on the above analysis, the proposed Plan would not result in an increased reliance on fossil fuels and decreased reliance on renewable energy sources related to regional growth and land use changes. This impact is less than significant.

Transportation Network Improvements and Programs

As shown in Table 4.6-5 in Impact EN-1, total energy use under implementation of the proposed Plan from fossil fuels (gasoline and diesel) associated with transportation network improvements and programs would decrease by about 3~~4~~8 percent from 2012 to 2050.

Impact EN-1 describes state and regional regulations and programs that would reduce per capita energy use; the same regulations and programs would also decrease reliance on fossil fuels and increase reliance on renewable energy. These include the Advanced Clean Cars regulations, zero emission vehicle regulations, the Low Carbon Fuel Standard, Cap-and-Trade program, and emission standards for off-road equipment. Specific measures include new vehicle efficiency standards and expansion of the ZEV Action Plan for medium- and heavy-duty ZEVs. Executive Order B-16-2012 set a long-term goal of 1.5 million ZEVs on California's roadways by 2025, including PEVs and hydrogen FCEVs. Increased deployment of ZEVs would replace traditional gasoline and diesel-powered vehicles and therefore reduce reliance on fossil fuels in the transportation sector during implementation of the proposed Plan. Fuel economy standards for passenger vehicles and light-duty trucks will become more stringent for model year 2017 to 2025 vehicles, which will continue to improve the overall fuel efficiency of the vehicle fleet as older vehicles are replaced with new ones that meet the more efficient standards.

The CEC's Alternative and Renewable Fuel and Vehicle Technology Program is funded through 2024 and would continue funding projects such as electric vehicle charging stations that would reduce dependence on fossil fuels, particularly when combined with overall increases in renewable energy sources as a result of the RPS requirements for the San Diego region.

In addition, the SCS land use pattern and transportation network improvements and programs play an important role in decreasing reliance on fossil fuel energy sources by decreasing per capita vehicle miles traveled. The decrease in per capita VMT is attributable to a number of factors considered in the proposed Plan's transportation modeling: proposed Plan investments in transit and managed lanes; TDM programs such as carpooling, vanpooling, mobility hubs, and teleworking; and demographic (e.g., aging population) and economic (e.g., fuel price factors). Based on the above analysis, planned transportation network improvements and programs would not result in an increased reliance on fossil and a decreased reliance on renewable energy sources. This impact is less than significant.

2050 Conclusion

Implementation of regional growth and land use change and planned transportation network improvements would not result in increased reliance on fossil fuels and decreased reliance on renewable energy sources because total energy use would decrease, fossil fuel energy consumption would decrease, and renewable energy consumption would increase. Therefore, this impact (EN-2) in the year 2050 is less than significant.

EN-3 REQUIRE OR RESULT IN THE CONSTRUCTION OF NEW ENERGY FACILITIES OR THE EXPANSION OF SUCH FACILITIES TO ADEQUATELY MEET PROJECTED DEMAND, THE CONSTRUCTION OF WHICH COULD CAUSE A SIGNIFICANT ENVIRONMENTAL EFFECT.

ANALYSIS METHODOLOGY

This section analyzes the need for construction of new or expanded energy facilities to adequately meet projected demand for energy associated with forecasted regional growth and land use change and planned transportation network improvements and programs under the proposed Plan. The analysis considers plans for construction of power plant and fuel distribution facilities to meet energy demand projections. The need for new energy facilities to meet increased demands is evaluated, and the general nature of these facilities (e.g., power plants, transmission lines, gas pipelines) is described based on available information from SDG&E, Sempra, and other sources.

During the timeframe of the proposed Plan, climate change effects that are likely to exacerbate the proposed Plan's contribution to requirements for new energy facilities include, but are not limited to, higher annual average temperatures, more days of extreme high temperatures, and longer and more humid heat waves. In general, these climate change effects would increase between 2020 and 2050. Climate change effects on energy consumption in the San Diego region are discussed in more detail in Appendix F to this EIR.

2020

Regional Growth and Land Use Change

As shown in Table 4.6-3 under Impact EN-1, total energy use associated with regional growth and land use change would increase by about 2 percent from 2012 to 2020; total electricity and natural gas consumption would increase by 2020. As a result, new or expanded energy facilities would likely be needed to meet future energy needs, including power plants, distributed generation, electrical transmission and distribution infrastructure, and natural gas facilities (e.g., storage, pipelines).

SDG&E's long-term planning process considers a ten-year planning horizon and seeks to implement the State's loading order and to integrate the various resource options available to serve bundled customer needs. The CPUC authorized SDG&E to procure between 500 and 800 MW of electrical capacity in its territory to meet long-term local capacity requirements by the end of 2021. Procurement must include at least 25 MW of local capacity from energy storage resources and at least 175 MW of local capacity must be procured from preferred resources consistent with the Loading Order of the Energy Action Plan (CPUC 2014). Therefore, new generation facilities or expansion of existing facilities would be needed to produce more electricity. SDG&E would be subject to the RPS requirement for 33 percent renewable electricity by 2020, and therefore, energy demand would be met with a variety of renewable and nonrenewable resources.

The impacts of construction and operation of the facilities would have a range of impacts depending on the facility type, size, and location. Additional demand for natural gas may also require the construction of new supply, conveyance, storage, and distribution infrastructure. Additional transmission lines would be needed to meet growing demand for electricity resulting from regional population, housing, and employment growth. Additional facilities would also be needed depending on the location and timing of regional growth and the location of new generation facilities.

Forecasted regional growth and land use change would primarily occur in or adjacent to areas that are already developed and that have electricity and natural gas infrastructure in place. Although this would reduce the need for construction of new facilities in other areas, the increases in demand for electricity and natural gas would result in upgrades of transmission lines, substations, distribution and related facilities that already serve these areas to ensure that energy infrastructure adequately meets future needs.

The provision of new or expansion of existing energy facilities would result in short-term construction-related impacts and long-term operational impacts, such as air quality, noise, traffic, and other resource areas. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded energy facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered energy facilities would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

As shown in Table 4.6-3 in Impact EN-1, total energy use under implementation of the proposed Plan associated with transportation network improvements and programs would decrease by about 13 percent from 2012 to 2020; gasoline consumption would decrease by about 16 percent, while diesel consumption would increase by ~~25~~ 18 percent. As a result, the proposed Plan would not require or result in the construction of new or expanded gasoline facilities, but would require the construction of new or expanded diesel facilities, such as those for the storage or transport diesel fuel.

Planned transportation network improvements by 2020, including new managed lanes, new general purpose lanes, the new SR 11 toll lanes, new active transportation improvements, and improvements to regional arterials, would require electrical power for ancillary project features such as streetlights, traffic lights, and informational signs. In addition, the Mid-Coast Trolley Extension would require electrical power for operation of the light-rail cars. Moreover, implementation of state and regional regulations and programs such as ARB's Advanced Clean Cars Program and zero emission vehicle regulations would increase the number of alternative fuel vehicles, such as electric vehicles and hydrogen powered cars, which would require new or expanded charging or fueling infrastructure. As the number of electric vehicles increase, upgrades to electrical distribution infrastructure would likely be required in certain communities, particularly if such vehicles are concentrated in the same area. The new *Rapid* bus services and increased frequencies for regional and local bus routes would require additional buses that rely primarily on compressed natural gas, which would increase demand for natural gas and require additional fueling infrastructure and associated facilities. As a result, planned transportation network improvements would contribute to the need for new or expanded electrical and natural gas facilities as described for regional growth and land use change.

The provision of new or expansion of existing energy facilities would result in short-term construction-related impacts and long-term operational impacts, such as air quality, noise, traffic, and other resource areas. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded energy facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered energy facilities would be less than significant for all projects. Therefore, transportation network improvements and programs would cause a significant impact.

2020 Conclusion

Implementation of regional growth and land use change and transportation network improvements would result in the construction of new and expanded energy facilities, the construction of which could cause significant environmental effects, because total electricity, natural gas, and diesel consumption would increase. Therefore, this impact (EN-3) in the year 2020 is significant.

2035

Regional Growth and Land Use Change

As shown in Table 4.6-4 under Impact EN-1, total energy use associated with regional growth and land use change would increase by about 7.5 percent from 2012 to 2035; total electricity and natural gas consumption would increase by 2035. As a result, new or expanded energy facilities would likely be needed to meet future energy needs, including power plants, distributed generation, electrical transmission and distribution infrastructure, and natural gas facilities (e.g., storage, pipelines).

As discussed under the impact analysis for 2020, new facilities for generation, transmission, storage, and distribution of electricity and natural gas would be needed due to increases in electricity and natural gas consumption. Due to the existing RPS requirement for 33 percent renewable electricity, SDG&E would likely continue to procure electricity from renewable sources in order to comply with the 33 percent requirement as total electricity generation continues to grow; nonrenewable sources would also be used to generate electricity if the 33 percent requirement has not increased by 2035. In general, new electrical generating facilities would require new or upgraded transmission facilities to connect to the regional or local electricity grids.

The impacts of construction and operation of the facilities would have a range of impacts depending on the facility type, size, and location. Additional demand for natural gas would likely require the construction of new supply, conveyance, storage, and distribution infrastructure. Additional transmission lines would be needed to meet growing demand for electricity resulting from regional population, housing, and employment growth. Additional facilities would also be needed depending on the location and timing of regional growth and the location of new generation facilities.

Forecasted regional growth and land use change would primarily occur in or adjacent to areas that are already developed and that have electricity and natural gas infrastructure in place. Although this would reduce the need for construction of new facilities in other areas, the increases in demand for electricity and natural gas would result in upgrades of transmission lines, substations, distribution and related facilities that already serve these areas to ensure that energy infrastructure adequately meets future needs.

The provision of new or expansion of existing energy facilities would result in short-term construction-related impacts and long-term operational impacts, such as air quality, noise, traffic, and other resource areas. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded energy facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered energy facilities would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

As shown in Table 4.6-4 in Impact EN-1, total energy use under implementation of the proposed Plan from fossil fuels (gasoline and diesel) associated with transportation network improvements and programs would decrease by about 3<u>5</u>~~6~~ percent from 2012 to 2035; gasoline consumption would decrease by about 4<u>3</u>~~6~~ percent, while diesel consumption would increase by 47 percent. As a result, the proposed Plan would not require or result in the construction of new or expanded gasoline facilities, but would require the construction of new or expanded diesel facilities, such as those for the storage or transport diesel fuel.

Planned transportation network improvements by 2035, including new managed lanes, new general purpose lanes, new active transportation improvements, and improvements to regional arterials, would require electrical power for ancillary project features such as streetlights, traffic lights, and informational signs. In addition, the trolley extensions and street cars would require electrical power for operation of the light-rail cars. Moreover, implementation of state and regional regulations and programs such as ARB's Advanced Clean Cars Program and zero emission vehicle regulations would increase the number of alternative fuel vehicles, such as electric vehicles and hydrogen powered cars, which would require new or expanded charging or fueling infrastructure. As the number of electric vehicles increase, upgrades to electrical distribution infrastructure would likely be required in certain communities, particularly if such vehicles are concentrated in the same area. The new *Rapid* bus services and increased frequencies for regional and local bus routes would require additional buses that rely primarily on compressed natural gas, which would increase demand for natural gas and require additional fueling infrastructure and associated facilities. As a result, planned transportation network improvements would contribute to the need for new or expanded electrical and natural gas facilities as described for regional growth and land use change.

The provision of new or expansion of existing energy facilities would result in short-term construction-related impacts and long-term operational impacts, such as air quality, noise, traffic, and other resource areas. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded energy facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered energy facilities would be less than significant for all projects. Therefore, transportation network improvements and programs would cause a significant impact.

2035 Conclusion

Implementation of regional growth and land use change and transportation network improvements would result in the construction of new and expanded energy facilities, the construction of which could cause significant environmental effects, because total electricity, natural gas, and diesel consumption would increase. Therefore, this impact (EN-3) in the year 2035 is significant.

2050

Regional Growth and Land Use Change

As shown in Table 4.6-5 under Impact EN-1, total energy use associated with regional growth and land use change would increase by about 14 percent from 2012 to 2050; total electricity and natural gas consumption would increase by 2020. As a result, new or expanded energy facilities would likely be needed to meet future energy needs, including power plants, distributed generation, electrical transmission and distribution infrastructure, and natural gas facilities (e.g., storage, pipelines).

As discussed under the impact analysis for 2020, new facilities for generation, transmission, storage, and distribution of electricity and natural gas would be needed due to increases in electricity and natural gas consumption. Due to the existing RPS requirement for 33 percent renewable electricity, SDG&E would continue to procure electricity from renewable sources in order to comply with the 33 percent requirement as total electricity generation continues to grow; nonrenewable sources would also be used to generate electricity if the 33 percent requirement has not increased by 2050. In general, new electrical generating facilities would require new or upgraded transmission facilities to connect to the regional or local electricity grids.

The impacts of construction and operation of the facilities would have a range of impacts depending on the facility type, size, and location. Additional demand for natural gas would likely require the construction of new supply, conveyance, storage, and distribution infrastructure. Additional transmission lines would be needed to meet growing demand for electricity resulting from regional population, housing, and employment growth. Additional facilities would also be needed depending on the location and timing of regional growth and the location of new generation facilities.

Forecasted regional growth and land use change would primarily occur in or adjacent to areas that are already developed and that have electricity and natural gas infrastructure in place. Although this would reduce the need for construction of new facilities in other areas, the increases in demand for electricity and natural gas would result in upgrades of transmission lines, substations, distribution and related facilities that already serve these areas to ensure that energy infrastructure adequately meets future needs.

The provision of new or expansion of existing energy facilities would result in short-term construction-related impacts and long-term operational impacts, such as air quality, noise, traffic, and other resource areas. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded energy facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered energy facilities would be less than significant for all projects. Therefore, regional growth and land use change would cause a significant impact.

Transportation Network Improvements and Programs

As shown in Table 4.6-5 in Impact EN-1, total energy use under implementation of the proposed Plan from fossil fuels (gasoline and diesel) associated with transportation network improvements and programs would decrease by about 3~~4~~8 percent from 2012 to 2050; gasoline consumption would decrease by about 4~~4~~8 percent, while diesel consumption would increase by about 66 percent. As a result, the proposed Plan would not require or result in the construction of new or expanded gasoline facilities, but would require the construction of new or expanded diesel facilities, such as those for the storage or transport diesel fuel.

Planned transportation network improvements by 2050, including new managed lanes, new general purpose lanes, new active transportation improvements, and improvements to regional arterials, would require electrical power for ancillary project features such as streetlights, traffic lights, and informational signs. In addition, the trolley extensions and street car would require electrical power for operation of the light-rail cars. Moreover, implementation of state and regional regulations and programs such as ARB's Advanced Clean Cars Program and zero emission vehicle regulations would increase the number of alternative fuel vehicles, such as electric vehicles and hydrogen powered cars, which would require new or expanded charging or fueling infrastructure. As the number of electric vehicles increase, upgrades to electrical distribution infrastructure would likely be required in certain communities, particularly if such vehicles are concentrated in the same area. The new *Rapid* bus services and increased frequencies for regional and local bus routes would require additional buses that rely primarily on compressed natural gas, which would increase demand for natural gas and require additional fueling infrastructure and associated facilities. As a result, planned transportation network improvements would contribute to the need for new or expanded electrical and natural gas facilities as described for regional growth and land use change.

The provision of new or expansion of existing energy facilities would result in short-term construction-related impacts and long-term operational impacts, such as air quality, noise, traffic, and other resource areas. Construction-related and long-term operational impacts are typically controllable and avoided or substantially lessened by mitigation measures adopted by the implementing agency, including adherence to existing regulations and BMPs. Because details are not known about timing, location, and other project-specific information for new or expanded energy facilities, it cannot be guaranteed that impacts from the construction and operation of new or physically altered energy facilities would be less than significant for all projects. Therefore, transportation network improvements and programs would cause a significant impact.

2050 Conclusion

Implementation of regional growth and land use change and transportation network improvements would result in the construction of new and expanded energy facilities, the construction of which could cause significant environmental effects, because total electricity, natural gas, and diesel consumption would increase. Therefore, this impact (EN-3) in the year 2050 is significant.

MITIGATION MEASURES

Impact EN-3: Construction of Energy Facilities

2020, 2035, and 2050

EN-3A Mitigate Impacts of New or Expanded Energy Facilities. During the planning, design, and project-level CEQA review process, San Diego region energy providers, the County of San Diego, cities, and other local jurisdictions with responsibility for the construction or approval of new natural gas, electricity, and transportation fuel facilities or the expansion of existing facilities to adequately meet projected capacity needs can and should apply necessary mitigation measures to avoid or reduce significant environmental impacts associated with the construction or expansion of such facilities. The environmental impacts associated with such construction or expansion should be avoided or reduced through the imposition of conditions required to be followed by those directly involved in the construction or expansion activities. Such conditions should include those necessary to avoid or reduce environmental impacts associated with, but not limited to, air quality, noise, traffic, biological resources, cultural resources, GHG emissions, hydrology and water quality, and others that apply to specific construction or expansion of natural gas and electric facilities projects.

EN-3B Develop Energy Demand Calculations and Reduce Energy Demand. During the planning, design, and project-level CEQA review process for individual development projects, San Diego region energy providers, the County of San Diego, cities, and other local jurisdictions can and should develop electricity and natural gas demand calculations for any project anticipated to require substantial energy consumption. Projects should implement design and mitigation measures that reduce energy consumption and promote the use of on-site renewable energy.

SIGNIFICANCE AFTER MITIGATION

2020, 2035, and 2050

Implementation of the proposed Plan would result in significant impacts from the construction of new natural gas, electricity, and diesel fuel facilities or the expansion of existing facilities that would be required to adequately meet projected capacity needs in the years 2020, 2035, and 2050. Implementation of Mitigation Measures EN-3A and EN-3B would reduce impacts associated with the construction of natural gas and electricity facilities. However, it cannot be guaranteed that all future project-level impacts can be mitigated to a less than significant level. Therefore, adverse impacts on this impact (EN-3) would remain significant and unavoidable.