

3.8 Energy Resources

3.8.1 Introduction

This section discusses energy resources in the study area and evaluates the potential impacts of the types of restoration projects that would be permitted under the Order. This section was prepared pursuant to Section 15126.4(a)(1)(c) and Appendices F and G of the State CEQA Guidelines.

The environmental setting and evaluation of impacts on energy resources is based on a review of existing environmental studies, data, and modeling results; information regarding example projects similar to those permitted under the Order that may be implemented by other agencies; and other information sources listed in Chapter 8, *References*.

No comments addressing energy resources were received in response to the notice of preparation (NOP). See Appendix B for NOP comment letters.

3.8.2 Environmental Setting

The construction of projects consumes energy both directly and indirectly. Energy is also consumed during the operations and maintenance (O&M) of project facilities, such as pumping water into off-stream storage ponds and tanks. This section describes energy consumption for California generally because the study area covers much of the geographic extent of the state.

In California, energy consumption is divided into four primary sectors: transportation, industrial, commercial, and residential. According to the U.S. Energy Information Administration (EIA 2018), of the total energy consumption in California in 2017, transportation consumed 40.3 percent, industrial 23 percent, commercial 18.7 percent, and residential 18 percent. In 2017, natural gas was the largest single energy source consumed in California, at 33 percent.

Table 3.8-1 summarizes California's energy consumption by energy source for 2017. Energy consumption in the study area varies by location but includes residential, agricultural, municipal, industrial, and transportation uses, and natural gas and crude oil energy sources.

**Table 3.8-1
 Energy Consumption in California, 2017**

Type of Energy	Trillion Btu	Consumption Percentage
Coal	33.7	Less than 1%
Natural gas	2,190.6	28%
Motor gasoline, excluding ethanol	1,720.8	22%
Distillate fuel oil	577.3	7%
Jet fuel	693	9%
Liquefied petroleum gas	55.7	1%
Residual fuel	165	2%
Other petroleum	322.4	4%
Nuclear electric power	187.2	2%
Hydroelectric power	390.3	5%
Biomass	272.2	3%
Other renewables	567.1	7%
Net electricity Imports	48.6	1
Net interstate flow of electricity	659.4	8%
Total	7,883.3	100%

SOURCE: EIA 2018

NOTE: Btu = British thermal units

3.8.3 Regulatory Setting

This section discusses federal, state, and regional and local plans, policies, regulations, and laws, and ordinances pertaining to energy resources.

Future permitted restoration projects that would be implemented under the Order may be subject to the laws and regulations listed below, as well as other local or individual restoration projects requirements, depending on the project location. The federal and state governments regulate power production and energy efficiency measures.

Federal

Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the interstate transmission of energy (electricity, natural gas, and oil). FERC also reviews proposals to build liquefied natural gas terminals and interstate natural gas pipelines, and for licensing of hydropower projects (FERC 2020a).

FERC Order Numbers 888 and 889

California's energy market is regulated by FERC Order Nos. 888 and 889. These orders, issued in 1996 and 1997, respectively, apply to public utilities that own, control, or operate facilities for transmitting electricity in interstate commerce.

Under Order No. 888, the affected public utilities must offer open-access, nondiscriminatory transmission tariffs with minimum terms and conditions of service. The utilities may seek to recover the justifiable stranded costs (the potential losses to electric power utilities as their industry is deregulated [CBO 1998]) of providing open-access transmission services (FERC 2020b).

FERC Order No. 889 requires public utilities to participate in the Open Access Same-Time Information System. This participation is intended to inform current and potential open-access transmission customers regarding available transmission capacity, prices, and other relevant data (FERC 2020b).

Federal Power Act

The Federal Power Act (U.S. Code Title 16, Section 4[e] [16 USC 4(e)]) grants FERC the authority to issue licenses for hydropower projects of any size that fall into any of the following categories:

- ◆ Located on navigable waters
- ◆ Located on non-navigable waters that are under the jurisdiction of Congress under the Commerce Clause, were constructed after 1935, and affect the interests of interstate or foreign commerce
- ◆ Located on public lands or reservations of the United States
- ◆ Using surplus water or water power from a federal dam

There are 74 hydropower projects in California pending relicense by FERC (FERC 2020c). Relicensing projects typically incur increased costs for environmental protection and project enhancement, which in turn can increase the costs of power generation. As a result, the power generation and operational flexibility of relicensed projects often decreases. For these reasons, future relicensing efforts have the potential to change the number of operating hydroelectric facilities.

North American Electric Reliability Corporation

The North American Electric Reliability Corporation is an international regulatory authority that develops and enforces standards for power system reliability, and assesses seasonal and long-term energy reliability. The North American Electric Reliability Corporation is subject to FERC oversight (NERC 2020).

Western Electricity Coordinating Council

With delegated authority from the North American Electric Reliability Corporation and FERC, the Western Electricity Coordinating Council is a regional entity that promotes bulk power system reliability and security in the Western Interconnection, which extends across 14 Western U.S. states; Alberta and British Columbia, Canada; northern Baja California, Mexico (WECC 2020). The Western Electricity Coordinating Council participates in the development of reliability standards, then enforces the standards.

Energy Policy Act of 2005

The Energy Policy Act (42 USC 13201 et seq.) addresses topics related to U.S. energy production: energy efficiency; renewable energy; oil and gas; coal; vehicles and motor fuels, including ethanol, electricity, hydropower, and geothermal energy; and climate change technology. For example, the law increases the amount of biofuel that must be mixed with gasoline sold in the United States (EPA 2017).

Federal Fuel Efficiency Standards

The Energy Independence and Security Act of 2007 (Public Law 110-140; 42 USC 7545[o][2]) increased the supply of alternative fuels by setting a Renewable Fuel Standard, which requires the blending of 36 billion gallons of renewable fuel in transportation fuels by 2022. The Energy Independence and Security Act also tightened the Corporate Average Fuel Economy (CAFE) standards that regulate average fuel economy in the vehicles produced by each major automaker. The law required that these standards be increased such that, by 2020, new cars and light trucks would deliver a combined fleet average of 35 miles per gallon (mpg) (EPA 2017).

Since then, several changes to the CAFE standards have occurred:

- ◆ In 2009, the standard for passenger cars and light trucks was increased to 35.5 mpg by model year 2016. Guidelines were made stricter, requiring that averages rise approximately 5 percent annually, roughly setting passenger cars at 39 mpg and light trucks at 30 mpg.
- ◆ In 2010, CAFE standards were proposed for medium-duty and heavy-duty trucks. Fuel economy improvements were to be 20 percent for tractors and 10 percent for gasoline trucks and diesel trucks by model year 2018.
- ◆ In 2011, an agreement was announced with 13 large automakers to increase fuel economy for passenger cars and light trucks to 54.5 mpg.
- ◆ A 2016 mid-term review analyzed how the industry was progressing with the new standards in place. Although the industry was found to be making improvements, the mid-term review found the 54.5 mpg projection to be unrealistic. In part, the mix of vehicles on which the projections were based on used more passenger vehicles while the actual market was closer to 50 percent passenger cars and 50 percent trucks and sport utility vehicles.
- ◆ In August 2018, the U.S. Environmental Protection Agency and U.S. Department of Transportation proposed the Safer Affordable Fuel-Efficient Vehicle Rules. This proposal would roll back some of the goals from 2012 and freeze the fuel economy goals to the 2021 target of 37 mpg.

State

California Energy Commission

The California Energy Commission (CEC) is the state's primary energy policy and planning agency. CEC is committed to reducing the cost of energy and environmental impacts of energy use while ensuring a safe, resilient, and reliable energy supply. The

commission's core responsibilities include advancing state energy policy, achieving energy efficiency, certifying thermal power plants, investing in energy innovation, transforming transportation, developing renewable energy, and preparing for energy emergencies (CEC 2020a).

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates privately owned electricity and natural gas companies. CPUC requires hydroelectric power companies to certify their compliance with O&M standards for each generating unit (CPUC 2017). Regulated utilities must obtain a CPUC certificate of Public Convenience and Necessity to construct transmission lines 200 kilovolts and greater, or a Permit to Construct for facilities between 50 and 200 kilovolts. Facilities operated by the California Department of Water Resources are not subject to CPUC oversight.

California Independent System Operator Corporation

The California Independent System Operator is an independent operator of approximately 80 percent of the statewide wholesale power grid, and is responsible for system reliability and scheduling of available transmission capacity (CAISO 2017).

California Renewable Energy Resources Act

The California Renewable Energy Resources Act added and amended various sections of the Fish and Game Code, Public Resources Code, and Public Utilities Code. This law codified California's commitment to expanding the Renewables Portfolio Standard to include 33 percent renewable power by 2020. Updates to the California Renewables Portfolio Standard were subsequently codified in 2011 (33 percent renewable power by 2020), 2015 (50 percent renewable power by 2030), and 2018 (60 percent renewable power by 2030 and 100 percent renewable power by 2045).

All electricity retail sellers had an interim target between compliance periods to serve at least 27 percent of their load with Renewables Portfolio Standard–eligible resources by December 31, 2017 (CPUC 2020). In general, retail sellers either met or exceeded the interim 27 percent target and are on track to achieve their compliance requirements. California's three large investor-owned utilities collectively served 36 percent of their 2017 retail electricity sales with renewable power. The small and multi-jurisdictional utilities and electric service providers served roughly 27 percent of retail sales with renewables and community choice aggregators collectively served 50 percent of retail sales with renewable power (CPUC 2020). All retail sellers use a mix of renewables portfolio standard resources such as wind, solar photovoltaic, solar thermal, hydroelectricity, geothermal, and bioenergy to meet their renewable procurement targets (CPUC 2020).

In 2015, Pacific Gas and Electric Company served 29.5 percent of its retail customers with renewable energy, while Southern California Edison served its customers with 24.3 percent, and San Diego Gas and Electric Company with 35.2 percent (CPUC 2017).

Title 24 Building Energy Efficiency Standards (2019)

Title 24 of the California Code of Regulations is the California Building Code, which governs all aspects of building construction. The code includes standards mandating the use of energy efficiency measures in new construction. Since they were established in 1977, the building efficiency standards (along with energy efficiency standards for appliances) have helped to reduce the costs of electricity and natural gas for consumers in California. The standards are updated every 3 years to allow consideration of new energy efficiency technologies. The latest update to Title 24 standards became effective on January 1, 2020. The standards contain energy and water efficiency requirements (and indoor air quality requirements) for newly constructed buildings, additions to existing buildings, and alterations to existing buildings (CEC 2019).

California Integrated Energy Policy

In 2002, the California Legislature enacted Senate Bill 1389. The legislation reconstituted the state's responsibility to develop an integrated energy plan for electricity, natural gas, and transportation fuels. CEC adopts and transmits to the Governor and Legislature a report of findings biannually. Reports have been prepared since 2002.

Most recently, CEC published the draft 2019 Integrated Energy Policy Report in November 2019 (CEC 2019). The report assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors; provides policy recommendations to conserve resources, protect the environment, ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (CEC 2020b). The report covers such topics as decarbonizing buildings, integrating renewables, energy efficiency, energy equity, integrating renewable energy, updates on Southern California electricity reliability, climate adaptation activities for the energy sector, natural gas assessment, transportation energy demand forecast, and the California Energy Demand Forecast (CEC 2019).

Senate Bill 350

Effective January 1, 2016, Senate Bill 350 raised the Renewables Portfolio Standard for both investor-owned and publicly owned utilities. The law increased the amount of electricity that such utilities must generate and sell to retail customers per year from eligible renewable energy resources, from 33 percent to 50 percent by 2030 (SB 350 2015).

Regional and Local

The study area encompasses multiple counties with multiple cities throughout the entire geographic extent of California. Each county and city has local regulations and a general plan with unique energy generation and transmission policies that guide development. The policies may include reducing per-capita energy consumption, shifting toward use of a greater share of renewable sources of energy, and reducing peak demands.

3.8.4 Impacts and Mitigation Measures

Methods of Analysis

Energy resource impacts from the types of restoration projects permitted under the Order are evaluated in terms of how typical construction and operation of project components could impact existing energy resources. However, the precise locations and detailed characteristics of potential future individual restoration projects are yet to be determined. Therefore, this energy resource analysis focuses on reasonably foreseeable changes from implementation of the types of projects and actions that might be taken in the future consistent with the level of detail appropriate for a program-level analysis. Potential impacts on energy resources from restoration projects permitted under the Order generally fall into three categories:

- ◆ Impacts of construction activities on energy consumption
- ◆ Impacts on energy consumption or hydroelectric generation from O&M of constructed facilities, or on pumping as a result of changes in water levels and conveyance
- ◆ Potential conflicts with applicable plans, policies, or regulations of local counties that have been adopted for the purpose of improving energy efficiency or reducing consumption of fossil fuels

The approach to assessing energy resources impacts was to identify and review existing environmental studies, data, model results, and other information for projects that are consistent with those identified in Section 2.6, *Categories of Restoration Projects in the Order*, and Section 2.7, *Typical Construction, Operation, and Maintenance Activities and Methods*.

Direct energy consumption includes the use of petroleum, natural gas, or electricity by construction vehicles and equipment and for the O&M of facilities. *Indirect energy consumption* includes energy used for the extraction of raw materials, manufacturing, and transportation associated with manufacturing. Indirect energy use can also be a reduction in the generation of power (e.g., hydroelectric).

Permanent impacts are considered those that would result from indefinite environmental conditions created by projects permitted under the Order (e.g., new infrastructure such as pumps would be located indefinitely in one location, resulting in the permanent need for electricity for the constructed infrastructure). Temporary impacts are considered those that would be temporary in nature (e.g., construction-related energy demands).

Thresholds of Significance

In accordance with Appendices F and G of the State CEQA Guidelines, an impact related to energy resources is considered significant if the types of projects that would be permitted under the Order would do either of the following:

- ◆ Cause a substantially inefficient, wasteful, or unnecessary consumption of energy resources during project construction or operation

- ◆ Conflict with or obstruct a state or local plan for renewable energy or energy efficiency

Pursuant to State CEQA Guidelines Appendix F, *Energy Conservation*, this section also evaluates the following impact topics:

- ◆ Potential for an irreversible commitment of energy resources
- ◆ Short-term gains versus long-term impacts on energy resources
- ◆ Estimated energy consumption attributable to growth inducement by restoration projects permitted under the Order

See Chapter 5, *Other CEQA Considerations*, for additional information regarding significant irreversible environmental changes, and for an analysis of the growth inducement potential of the restoration projects permitted under the Order.

Impacts Not Evaluated Further

The restoration projects permitted under the Order would not likely affect production of crude oil, natural gas, or geothermal energy. The geographic extent of proven oil, natural gas, and geothermal fields is quite large, and these resources can be accessed in many locations. The restoration projects permitted under the Order would affect only a portion of the full geographic extent of these energy fields. The projects also would not preclude ongoing and future exploration and extraction of oil and natural gas resources or development of future geothermal facilities. Therefore, this section does not further evaluate access to oil, natural gas, and geothermal energy resources.

The extent to which the Order would result in any particular action resulting from individual restoration projects is yet determined and as such, impacts are considered at a programmatic level and the reasonable forecasting of effects. For future restoration projects that develop proposals consistent with the Order, and would be expected to result in significant energy costs over the projects' lifetime (i.e., short-term gain versus long-term impacts) would be required to be evaluated in project-level CEQA documents. Therefore, the impact of such costs is not discussed further in this section.

Project-Specific Impacts and Mitigation Measures

Table 3.8-2 summarizes the impact conclusions presented in this section for easy reference.

As part of the State Water Board or Regional Board's issuance of a NOA for a restoration project under the Order, compliance with the general protection measures and mitigation measures listed below would be required when applicable to a given project. Not all general protection measures and mitigation measures would apply to all restoration projects. The applicability of the general protection measures and mitigation measures would depend on the individual restoration activities, project location, and the potentially significant impacts of the individual restoration project. Implementation of the mitigation measures would be the responsibility of the project proponent(s) under the jurisdiction of the State Water Board, appropriate Regional Board, or other authorizing regulatory agency.

**Table 3.8-2
Summary of Impact Conclusions—Energy Resources**

Impact Statement	Construction Activities	Constructed Facilities and Operations and Maintenance
3.8-1: Implementing restoration projects permitted under the Order could result in substantial inefficient, wasteful, or unnecessary long-term consumption of energy resources or changes to hydropower generation.	LTS	LTS
3.8-2: Implementing restoration projects permitted under the Order could conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	LTS

SOURCE: Data compiled by Environmental Science Associates in 2019 and 2020

NOTE: LTS = less than significant

Impact 3.8-1: Implementing projects permitted under the Order could result in substantial inefficient, wasteful, or unnecessary long-term consumption of energy or changes to hydropower generation.

Effects of Project Construction Activities

Construction activities for restoration projects permitted under the Order (e.g., culverts, bridges, fish screens, ladders, and pilings; removal of small dams, tide gates, flood gates, and legacy structures; placement of bioengineered stabilization materials; grading and excavation to reconnect, set back, or breach levees; reconnection of stream and river channels; creation of depressions, berms, and drainage features; installation of cofferdams during construction) would require both direct and indirect use of energy resources:

- ◆ *Direct energy use* would involve using petroleum products and electricity to operate construction equipment, such as trucks or barges, earthmoving equipment, and power tools. For example, excavation and grading for a large restoration project could use gas- or diesel-powered construction equipment.
- ◆ *Indirect energy use* would involve consuming energy to extract raw materials, manufacture items, and transport the goods and people necessary for construction activities. For example, workers would commute to the project sites.

Although construction-related energy consumption would be limited to the construction period, these activities would cause irreversible commitments of finite nonrenewable energy resources, such as gasoline and diesel fuel.

Depending on the project, various types of fuel-consuming equipment would be necessary for actions such as excavating, grading, demolishing structures, transporting materials, and transporting construction workers to and from the worksites.

Construction activities for restoration projects permitted under the Order would incorporate all feasible control measures to improve equipment efficiency and reduce energy use, as required by local air pollution control or management districts. These measures may include best management practices to meet the efficiency standards for

on-site construction vehicles and exhaust control plans to reduce unnecessary equipment idling. The projects would also implement other policies consistent with state and local legislation and policies for energy conservation to help reduce energy use during project construction.

For example, constructing a large restoration project (e.g., widening a floodplain) would increase energy consumption. However, the increase would be limited because the work would be temporary and would not require the substantial long-term use of energy.

Construction activities for the restoration projects permitted under the Order would not be expected result in the inefficient, wasteful, or unnecessary use of energy. Therefore, this impact would be **less than significant**. The Order does not include any general protection measures applicable to this impact.

Effects of Constructed Facilities (Natural or Artificial Infrastructure) and Operations and Maintenance of those Facilities

Similar to construction, O&M activities for restoration projects permitted under the Order would require both direct and indirect use of energy resources and irreversible commitments of finite nonrenewable energy resources. However, the effect would occur to a lesser degree. For example, O&M could include such activities as monitoring restoration projects, cleaning fish screens, and occasionally maintaining offstream water conservation projects. In addition, the restoration projects would not change patterns of reservoir releases or substantially alter water surface elevations at existing pumping or generating facilities; thus, they would not affect hydropower generation or power usage.

Routine O&M activities for restoration projects permitted under the Order would not be expected to result in the inefficient, wasteful, or unnecessary use of energy. Therefore, this impact would be **less than significant**. The Order does not include any general protection measures applicable to this impact.

Impact 3.8-2: Implementing restoration projects permitted under the Order could conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Effects of Project Construction Activities

Construction activities for restoration projects permitted under the Order would require both direct and indirect use of energy resources. Such activities would incorporate all feasible control measures to improve equipment efficiency and reduce energy use, as required by local air pollution control or management districts. These measures may include best management practices to meet the efficiency standards for on-site construction vehicles and exhaust control plans to reduce unnecessary equipment idling. The projects would also implement other policies consistent with state and local legislation to help reduce energy use during construction.

Energy standards such as those in the Energy Policy Act of 2005 and Title 24 (the California Building Code) promote strategic planning and building standards intended to reduce the consumption of fossil fuels, increase the use of renewable resources, and enhance energy efficiency. In general, these regulations and policies specify

strategies for reducing fuel consumption and increasing fuel efficiency and energy conservation. It is anticipated that construction of restoration projects permitted under the Order would conform to applicable state and local plans, policies, and regulations related to energy use.

Construction activities for restoration projects permitted under the Order would require land for development (e.g., proposed project site; staging areas; access and haul routes; site preparation; preparation of barrow sites; site restoration and demobilization). These activities could occur on undeveloped land which are scarce, less expensive, and often sought after by various entities meeting various needs (e.g., restoration, mitigation, housing, and alternative energy) and could result in potentially obstructing development or implementation of other state or local plans for renewable energy or energy efficiency. However, impacts associated with the loss of development or implementation of other state or local plans for renewable energy or energy efficiency would be expected to be less than significant as construction activities for restoration projects would be limited to the construction period and would not involve long-term obstruction of undeveloped land.

Therefore, energy use by construction activities for restoration projects permitted under the Order would not likely conflict with any applicable state or local plans, policies, or regulations establishing energy standards and this impact would be **less than significant**. The Order does not include any general protection measures applicable to this impact.

Effects of Constructed Facilities (Natural or Artificial Infrastructure) and Operations and Maintenance of those Facilities

Routine O&M activities for restoration projects permitted under the Order would require direct and indirect use of energy resources similar to the use identified for construction, but to a lesser degree. For example, O&M could include such activities as monitoring restoration projects, cleaning fish screens, and occasionally maintaining offshore water conservation projects.

Restoration projects would incorporate all feasible control measures to improve equipment efficiency and reduce energy use, as required by local air pollution control or management districts. The projects would also implement other policies consistent with state and local legislation to help reduce energy use during O&M activities.

Energy standards such as those in the Energy Policy Act of 2005 and Title 24 (the California Building Code) promote strategic planning and building standards intended to reduce the consumption of fossil fuels, increase the use of renewable resources, and enhance energy efficiency. In general, these regulations and policies specify strategies for reducing fuel consumption and increasing fuel efficiency and energy conservation. It is anticipated that operational activities for restoration projects permitted under the Order would conform to applicable state and local plans, policies, or regulations related to energy use.

Restoration projects (e.g. setback levees, water conservation project, etc.) could be located on undeveloped land which are scarce, less expensive, and often sought after

by various entities meeting various renewable energy needs (e.g., alternative energy sources such as solar or wind farms). However, the constructed infrastructure would not be expected to obstruct a state or local plan for renewable energy as renewable projects could be built in other locations throughout the state.

Energy use during the operation of restoration projects permitted under the Order would not likely conflict with applicable state, regional, or local plans, policies, or regulations establishing energy standards. Therefore, this impact would be **less than significant**. The Order does not include any general protection measures applicable to this impact.