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STAFF REPORT

Review of Hetch Hetchy Power 2023 Integrated Resource Plan

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California Energy Commission

Joseph Merrill

Primary Author

Elise Ersoy

Program and Project Supervisor

Reliability & Emergency Unit

Liz Gill

Branch Manager

Reliability Analysis Branch

David Erne

Deputy Director

Energy Assessments Division

Aleecia Gutierrez

Director

Energy Assessments Division

Drew Bohan

Executive Director

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California Energy Commission

Brian McCollough

Bryan Neff

Ingrid Neumann

Cynthia Rogers

Brian Samuelson

Charles Smith

Angela Tanghetti

Usman Muhammad

Hetch Hetchy Power

San Francisco Public Utilities Commission/Hetch Hetchy Power staff

ABSTRACT

Senate Bill 350 (De León, Chapter 547, Statutes of 2015), established Public Utilities Code Section 9622, which requires the California Energy Commission to review the integrated resource plans of identified publicly owned utilities to ensure they meet various requirements specified in the law, including greenhouse gas emission reduction targets and renewable energy procurement requirements.

Integrated resource plans are long-term planning documents that outline how publicly owned utilities will meet demand reliably and cost effectively while achieving state policy goals and mandates. Hetch Hetchy Power submitted its Integrated Resource Plan and supplemental information for review on April 30, 2024. This staff paper presents the results of the California Energy Commission staff review of the *Hetch Hetchy Power 2023 Integrated Resource Plan*.

Keywords: Publicly owned utility, integrated resource plan, San Francisco Public Utilities Commission, SFPUC, City and County of San Francisco, San Francisco, Hetch Hetchy Power, HHP, demand, resources, portfolio, generation, transmission, distribution, Renewables Portfolio Standard, forecast, energy efficiency, transportation electrification, demand response, greenhouse gas, GHG, emissions, system reliability

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TABLE OF CONTENTS

Acknowledgements	i
Abstract	ii
Table of Contents.....	iii
List of Tables	iv
List of Figures.....	iv
Executive Summary.....	1
CHAPTER 1: Demand Forecast and Procurement.....	3
Introduction.....	3
Hetch Hetchy Power	3
HPP Planning Process	4
Energy and Peak Demand Forecast, Method and Assumptions	4
Resource Procurement Plan	5
Existing Resources	6
Resource Portfolio Evaluation.....	6
Procurement Strategy.....	7
CHAPTER 2: Review for Consistency with PUC Section 9621 Requirements.....	8
Greenhouse Gas Emission Reduction Targets	8
Renewables Portfolio Standard Planning Requirements	9
Retail Rates	10
System and Local Reliability	10
Local Capacity Needs.....	10
Flexible Capacity Needs	11
Transmission and Distribution Systems	11
Transmission System.....	11
Distribution System	12
Disadvantaged Communities and Localized Air Pollutants.....	12
Net Energy Demand in Peak Hours.....	13
Additional Procurement Goals	13
Energy Efficiency and Demand Response Resources.....	13
Energy Storage	14
Transportation Electrification.....	15
Portfolio Diversification	16
APPENDIX A: Abbreviations	A-1
APPENDIX B: Glossary	B-1

LIST OF TABLES

Table 1: Planned HHP 2030 Greenhouse Gas Emissions.....	9
---	---

LIST OF FIGURES

Figure 1: Map of Hetch Hetchy Power System.....	4
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EXECUTIVE SUMMARY

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) requires publicly owned utilities with annual electrical demand exceeding 700 gigawatt-hours to adopt integrated resource plans that meet certain requirements, targets, and goals, including greenhouse gas emission reduction targets and renewable energy procurement requirements identified in Public Utilities Code Section 9621.

The California Energy Commission's (CEC) *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines* require the utilities to file an integrated resource plan with data and supporting information sufficient to demonstrate that they meet these requirements as well as the targets and planning goals from 2018 to 2030. Pursuant to PUC Section 9622, the CEC must review the integrated resource plans for consistency with the requirements of Public Utilities Code Section 9621.

Hetch Hetchy Power is a public utility owned and operated by the San Francisco Public Utilities Commission, a department of the City and County of San Francisco. Hetch Hetchy Power primarily provides power to San Francisco municipal departments and tenants on city property, as well as some commercial and residential customers within the city. Most of the power generated to serve Hetch Hetchy Power comes from three large hydroelectric facilities in the Sierra Nevada Mountains operated to meet San Francisco's water needs. Currently, Hetch Hetchy Power's generation profile produces net zero greenhouse gas emissions. Hetch Hetchy Power plans to meet the 2030 goals pertaining to the Renewables Portfolio Standard and 40 percent reduction of greenhouse gas emissions compared to 1990 levels.

In reviewing the *Hetch Hetchy Power 2023 IRP* and determining consistency with the requirements of Public Utilities Code Section 9621, CEC staff relied on the four standardized reporting tables and narrative descriptions in the integrated resource plan filing, as well as analysis and verification of the materials submitted. Staff presents the following conclusions in accordance with the requirements:

- *Achieving Greenhouse Gas Emissions Targets and Renewables Portfolio Standard Requirements:* Hetch Hetchy Power plans to meet the greenhouse gas emission reduction requirements of Public Utilities Code Section 9621(b)(1), and the renewable energy procurement requirement of Public Utilities Code Section 9621(b)(2). Hetch Hetchy Power plans to meet the Renewables Portfolio Standard using generation from the large, in-state hydroelectric facilities that it owns and operates, with the remainder of its energy procured from eligible renewable resources. This satisfies the alternate Renewables Portfolio Standard compliance mechanism of Public Utilities Code Section 399.30(j). Hetch Hetchy Power must use this alternate compliance mechanism because large hydroelectric generation would otherwise be ineligible to meet the Renewables Portfolio Standard. The filing shows net zero greenhouse gas emissions currently and plans for greenhouse gas emissions below the target range set by the California Air Resources Board for 2030. Hetch Hetchy Power owns and operates hydroelectric

generation that currently fully meets its energy and load requirements with zero greenhouse gas emissions. As Hetch Hetchy Power's load increases, Hetch Hetchy Power will need to supplement its generation in future years and plans to do so by fully supplementing its generation with Renewables Portfolio Standard eligible resources.

- *Meeting Planning Goals:* Hetch Hetchy Power intends to meet planning goals related to retail rates, reliability, transmission and distribution systems, as set forth in Public Utilities Code Section 9621(b)(3). The integrated resource plan demonstrates consideration for minimizing costs and other goals over the planning period, including minimizing impacts to ratepayers. The utility plans for adequate generation to meet capacity requirements and considers the impacts of the various options on the utility's transmission and distribution systems. Hetch Hetchy Power anticipates current distribution, transmission and local generation will be adequate to maintain reliability considering the load growth expected through 2030 but anticipates the need for long-term procurement of additional renewable resources after 2032.
- *Considering Peak Needs:* Hetch Hetchy Power considered the role of existing hydroelectric generation, energy storage, energy efficiency, transportation electrification, long-term renewable procurement and local capacity resources in helping ensure the utility's energy and reliability needs in the hours that encompass the peak hour as set forth in PUC Section 9621(c). The utility's modeling indicates sufficient existing capacity to meet its resource adequacy requirements, including a 15 percent planning reserve margin through 2030.
- *Addressing Resource Procurement Types:* The utility addressed the procurement requirements for energy efficiency and demand response, energy storage, transportation electrification, portfolio diversification, and resource adequacy as set forth in PUC Section 9621(d). The utility expects to exceed its individual energy efficiency doubling goal by 2030.

CHAPTER 1:

Demand Forecast and Procurement

Introduction

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) requires publicly owned utilities (POU) with an annual electrical demand exceeding 700 gigawatt-hours to develop integrated resource plans (IRPs).¹ IRPs are electricity system planning documents that describe how utilities plan to meet their energy and capacity resource needs while achieving policy goals and mandates, meeting physical and operational constraints, and fulfilling other priorities such as reducing impacts on customer rates. SB 350 requires the governing board of a POU to adopt an IRP and a process for updating it at least once every five years starting no later than January 1, 2019.² Hetch Hetchy Power (HHP) filed its initial IRP with the CEC on April 24, 2019, and was deemed compliant by the CEC in September of 2019.

Public Utilities Code (PUC) Section 9622 requires the California Energy Commission (CEC) to review POU IRPs to ensure they achieve PUC Section 9621 provisions. If the CEC determines an IRP is inconsistent with the requirements of PUC Section 9621, the CEC shall provide recommendations to correct the deficiencies. The CEC adopted the *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines (Guidelines)* to govern the submission and review of the POUs' IRPs.³

This chapter outlines the CEC's review process and provides an overview of HHP and its IRP development process. In addition, the chapter addresses the *Guidelines* requirements that POUs provide a demand forecast and a procurement plan as part of its IRP.

Hetch Hetchy Power

Hetch Hetchy Power (HHP) is a publicly owned utility (POU) owned and operated by the San Francisco Public Utilities Commission (SFPUC), a department of the City and County of San Francisco (San Francisco). HHP primarily powers San Francisco municipal departments and tenants on city property, including San Francisco International Airport and the Port of San Francisco. HHP also services some retail customers within the city. Most of the power generated to serve HHP comes from three hydroelectric facilities in the Sierra Nevada Mountains, the Holm, Kirkwood, and Moccasin Powerhouses, operated to meet San Francisco's

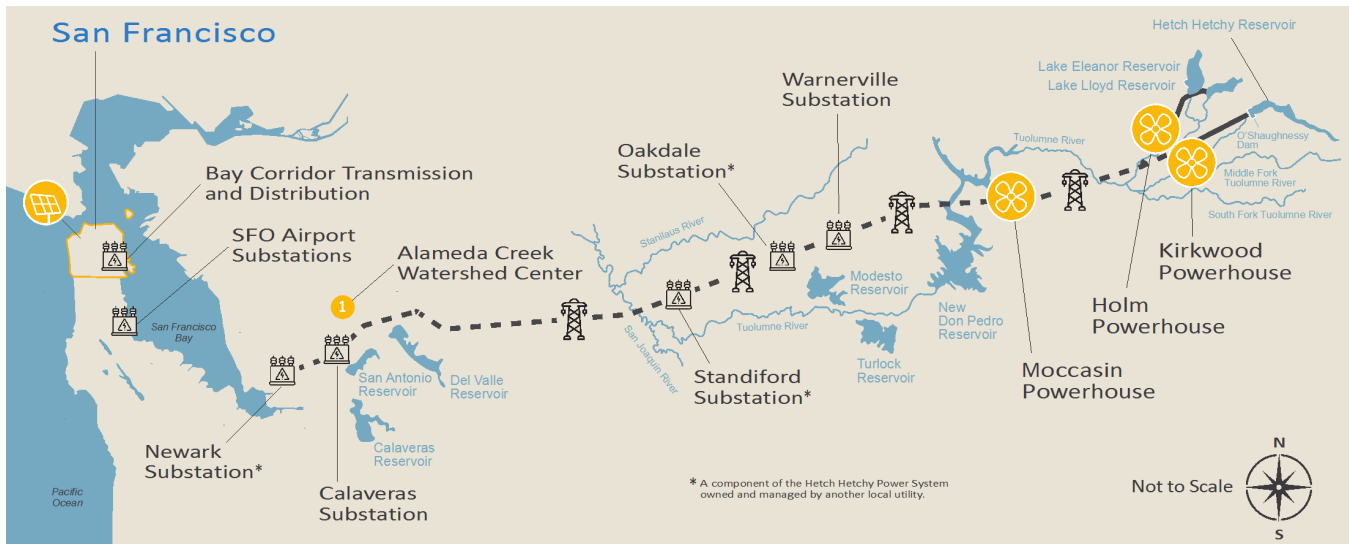
1 Public Utilities Code § 9621.

2 Public Utilities Code § 9621(b).

3 CEC. October 2018. *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines, 2nd ed.* Chapter 2.E.1. <https://efiling.energy.ca.gov/GetDocument.aspx?tn=224889&DocumentContentId=55481>.

water needs. Holm and Moccasin are large hydroelectric facilities. Kirkwood is a small hydroelectric facility. Currently, HHP's generation portfolio produces zero GHG emissions. Generation from the Hetch Hetchy Power system is transmitted by 167 miles of transmission owned and operated by SFPUC, fed into the California ISO system and delivered to most HHP customers through PG&E's distribution system.

Figure 1: Map of Hetch Hetchy Power System



Source: Hetch Hetchy Power

HPP Planning Process

The *Hetch Hetchy Power 2023 Integrated Resource Plan (2023 HPP IRP)* assesses needs over the 2024-2045 planning horizon to meet load growth with adequate reserves for system reliability, while meeting policy requirements and other constraints. The IRP evaluates generation resources, including renewable and long-term market options, and prepares preferred portfolios evaluated in detail using economic and risk assessments assuming a range of industry and market conditions. The 2023 HPP IRP was approved by the SFPUC's five-member Commission on November 28, 2023.

Energy and Peak Demand Forecast, Method and Assumptions

The *Guidelines* identify the need for a forecast of energy and peak demand to determine whether a POU's IRP is consistent with the requirements of PUC Section 9621.⁴ The *Guidelines* also state that the POU must provide information on the method used in developing the demand forecast if a POU uses a forecast other than the CEC's adopted demand forecast. The

⁴ POU IRP Guidelines, Chapter 2, E., pgs. 5–6.

demand forecast and supporting information provided present an adequate representation of future energy and peak demand that meets the *Guidelines* requirements.

HHP used its demand forecast submitted to the CEC for the Integrated Energy Policy Report (IEPR)⁵, supplemented with additional years beyond the IEPR planning period through 2045. The HHP load forecast considers real estate development trends within its service territory and major load changes among key customers, including San Francisco International Airport and the San Francisco Municipal Transportation Agency (SFMTA). Airport loads are expected to grow annually as indicated in the airport's Master Plan.⁶ SFMTA loads are expected to grow due to the new Central Subway extension and transitioning its bus fleets to all electric or fuel cell buses to meet the California Air Resources Board (CARB) Innovative Clean Transit Rule.⁷ Non-municipal energy growth is expected due to large redevelopment projects in southeastern San Francisco and in-fill projects throughout the city. HHP assumes 4 percent annual growth of residential customer energy use through 2033 and assumes 1 percent annual growth for 2034-2045 due to uncertainty. HHP expects net energy for load will be 984 GWh in 2024 and 1,290 GWh in 2030, and peak demand will be 159 MW in 2024 and 208 MW in 2030, reflecting an annual average growth of 4.6 percent.

The HHP IRP analyzes resource portfolio options based on four temperature scenarios: 1-in-2, 1-in-5, 1-in-10 and 1-in-20 year. These scenarios represent yearly temperature peaks occurring in the top 50 percent, 20 percent, 10 percent and 5 percent of years, respectively. Energy usage is expected to grow by 5 percent annually on average between 2024 and 2034 in the 1-in-2 year base case. HHP also considered three hydroelectric generating conditions for dry, normal, and wet years. HHP modeling anticipates its generation will be sufficient to meet its 1-in-2 load forecast under normal hydrological conditions through 2032 supplemented with spot market purchases. Beginning in 2033, HHP anticipates needing additional resources. IRP Figure 3-2, "Load Forecast and Hydroelectric Generation Scenarios", indicates that additional spot market purchases or other energy procurement may be needed in dry years beyond the energy loads assumed in the IRP Energy Balance Table.

Resource Procurement Plan

The *Guidelines* require that POUs report the mix of resources they plan to use to meet demand through 2030.⁸ POUs are also required to provide an IRP with data and supporting information sufficient to demonstrate that the POUs' plan to meet the various targets and

⁵ [Hetch Hetchy Power's \(City and County of San Francisco\) 2023 IEPR load forecast](https://efiling.energy.ca.gov/GetDocument.aspx?tn=250844&DocumentContentId=85743) is available at <https://efiling.energy.ca.gov/GetDocument.aspx?tn=250844&DocumentContentId=85743>.

⁶ Airport Commission Resolution No. 23-0263, November 7, 2023.

⁷ Innovative Clean Transit Regulations 13 C.C.R. §§ 2023-2023.11.

⁸ POU IRP Guidelines, Chapter 2.F., pg. 6.

goals. Staff determines the *2023 HHP IRP* filing meets these requirements. The following is a discussion of the utility's existing resources, procurement strategy, portfolio analysis underlying resource selections, and the resources in 2030 identified in the standardized reporting tables.

Existing Resources

HHP's current mix of resources is almost exclusively hydroelectric generation, comprising 99 percent of annual HHP generation: large hydro from the 165 MW Holm Powerhouse, 116 MW Kirkwood Powerhouse, and 100 MW Moccasin Powerhouse, and small hydro from the 4 MW Moccasin Low-head. HHP currently has enough hydroelectric generation capacity within this fleet to meet its demand through 2032 supplemented with spot market purchases. Because HHP owns and operates large hydroelectric generation facilities able to meet more than 67 percent of its power needs, HHP meets its Renewables Portfolio Standard obligations by meeting the remainder of its energy needs with Renewables Portfolio Standard eligible generation. This satisfies the alternate Renewables Portfolio Standard compliance mechanism of Public Utilities Code Section 399.30 (j), which is included as Footnote 1. About 8 MW of in-city solar, including the 5 MW Sunset Reservoir Solar Project, provides power to the HHP system. HHP's generation resources provide about 1,250,000 MWh per year during normal hydrological conditions. About 900,300 MWh are supplying about 6,000 HHP customers as of 2022. The excess is sold to California ISO markets, CleanPowerSF, and other qualified third parties.

Resource Portfolio Evaluation

HHP submitted standard tables for the Forecast Total Peak-Hour 1-in-2 Demand scenario. HHP expects to fully meet its capacity requirements, including its 15 percent planning reserve margin (PRM). Currently, HHP fully meets its capacity and PRM requirements with 380 MW of existing resources available to fulfill about 150 MW of customer load during peak demand. HHP is forecasting increasing demand over the 2024 – 2045 planning horizon, which will require procuring additional generation capacity after 2032 to meet its peak demand plus PRM.

HHP considered four resource scenarios:

- Scenario A: 100 MW of southern California solar starting in 2033, and 25 MW of Humboldt area offshore wind and 25 MW of geothermal starting in 2035.
- Scenario B: 100 MW of northern California solar starting in 2033, and 25 MW of onshore wind and 25 MW of geothermal starting in 2035.
- Scenario C: 100 MW of northern California solar starting in 2033, and 25 MW of Morro Bay area offshore wind and 25 MW of geothermal starting in 2035.
- Scenario D: 100 MW of southern California solar starting in 2033, and 50 MW of geothermal starting in 2035.

HHP anticipates offshore wind resources becoming available in the next ten years. Otherwise, the renewable resources considered in these scenarios are currently available. HHP modeling

assumes the 1-in-2 demand forecast and normal hydroelectric generation for each scenario. Based on its modeling, HHP expects to meet the 1-in-2 demand forecast through 2032 without new long-term procurement.

HHP performed portfolio cost analysis for each of four scenarios as well as the “Do Nothing” scenario. Scenarios A and D were the least cost scenarios, with scenario D being the most cost-effective. HHP uses the least cost Scenario D for its planning and results in the Standardized Tables. HHP modeling anticipates sufficient net qualifying capacity to meet forecasted annual resource adequacy requirements through 2045, assuming long-term procurement of 75 MW of battery storage starting in 2027 and the renewable resources in Scenario D starting in 2033.

Procurement Strategy

HHP plans to continue relying on generation from its fleet of large hydroelectric generators supplemented in future years by contracting for Renewables Portfolio Standard eligible renewable resources. Currently, HHP’s hydroelectric generation exceeds its customer peak load and annual energy usages, but additional generation will be needed in future years to fully meet its resource adequacy requirements, including a 15 percent PRM requirement. HHP plans to procure 75 MW of battery storage capacity starting in 2027, 100 MW of southern California solar PV starting in 2033, and 50 MW of geothermal starting in 2035.

CHAPTER 2:

Review for Consistency with PUC Section 9621 Requirements

This chapter summarizes the main elements of the *2023 HHP IRP* and provides staff's findings regarding the consistency with PUC Section 9621 requirements, as well as the *Guidelines*. These findings include whether the utility meets greenhouse gas (GHG) emission reduction targets and RPS energy procurement requirements, as well as planning goals for retail rates, reliability, transmission and distribution systems, net load, and disadvantaged communities. In addition to the above elements, the IRP must address procurement of energy efficiency and demand response, energy storage, transportation electrification and portfolio diversification.

Greenhouse Gas Emission Reduction Targets

POUs are required to meet the GHG targets established by the California Air Resources Board (CARB), in coordination with the CEC and California Public Utilities Commission.⁹ The initial GHG targets set by CARB reflect the electricity sector's percentage in achieving the economywide GHG emission reductions of 40 percent from 1990 levels by 2030. The 2030 electricity sector GHG planning target range was updated with CARB's *2022 Scoping Plan for Achieving Carbon Neutrality* adopted in September 2023.^{10,11}

The 2030 planning target range set for HHP by CARB in 2023 is 12,000-15,000 metric tons of carbon dioxide equivalent (MTCO_{2e}). Currently, HHP can fully meet its annual energy and peak load from its existing fleet of hydroelectric resources with zero GHG emissions. In future years additional generation will be needed and the HHP plans in those years to fully supplement its existing zero GHG emitting hydroelectric generation fleet with zero or very low GHG emitting RPS eligible resources. The GHG Emissions Accounting Table (GEAT) in the IRP Standardized Tables indicates HHP's GHG emissions expected in 2030 will be zero. HHP's planned GHG emissions are reported on the GHG Emissions Accounting Table in the standardized reporting tables and are summarized in **Table 1**.

9 Public Utilities Code § 9621(b)(1).

10 CARB. September 2023. [Senate Bill 350 Integrated Resource Planning Electricity Sector Greenhouse Gas Planning Targets: 2023 Update](https://ww2.arb.ca.gov/sites/default/files/2023-09/sb350-final-report-2023.pdf). <https://ww2.arb.ca.gov/sites/default/files/2023-09/sb350-final-report-2023.pdf>.

11 CARB. [2022 Scoping Plan for Achieving Carbon Neutrality](https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents). <https://ww2.arb.ca.gov/our-work/programs/ab-32-climate-change-scoping-plan/2022-scoping-plan-documents>.

Table 1: Planned HHP 2030 Greenhouse Gas Emissions

Power Source	Fuel Type	GHG Intensity (MT CO2e/MWh)	Total Emissions (MT CO2e) 2025	Total Emissions (MT CO2e) 2030
Holm Powerhouse	Large Hydro	0.0	0	0
Moccasin Powerhouse	Large Hydro	0.0	0	0
Kirkwood Powerhouse	Large Hydro	0.0	0	0
Moccasin Low-head	Small Hydro	0.0	0	0
Sunset Reservoir Solar	Solar PV	0.0	0	0
Total Portfolio Emissions	NA	NA	0	0

Source: CEC, Energy Assessments Division, Based on 2023 HHP IRP filing

Renewables Portfolio Standard Planning Requirements

PUC Section 9621(b)(2), as established by SB 350, requires that POU IRPs ensure procurement of at least 50 percent renewable energy resources by 2030, consistent with Article 16 (commencing with Section 399.11) of Chapter 2.3. In 2018, SB 100 (De León, Chapter 312, Statutes of 2018) increased the RPS requirement for 2030 from 50 to 60 percent by 2030.¹² Because HHP owns and operates large hydroelectric generation facilities able to meet more than 67 percent of its power needs, HHP meets its Renewables Portfolio Standard obligations by fully supplementing this generation with Renewables Portfolio Standard eligible generation. This satisfies the alternate Renewables Portfolio Standard compliance mechanism of Public Utilities Code Section 399.30 (j).

Public Utilities Code Section 399.30 (j) states:

“A local publicly owned electric utility in a city and county that only receives greater than 67 percent of its electricity sources from hydroelectric generation located within the state that it owns and operates, and that does not meet the definition of a “renewable electrical generation facility” pursuant to Section 25741 of the Public Resources Code, shall be required to procure eligible renewable energy resources, including renewable energy credits, to meet only the electricity demands unsatisfied by its hydroelectric generation in any given year, in order to satisfy its renewable energy procurement requirements.”

Staff reviewed the renewable procurement table, the discussion in the IRP filing, and the renewable procurement plan submitted. Staff finds HHP’s plans consistent with the RPS procurement requirements and all interim compliance periods, as well as the requirements of PUC Section 9621(b)(2).

¹² Public Utilities Code § 399.11(a).

Retail Rates

PUC Section 9621(b)(3) requires POU's to develop IRPs that enhance each POU's ability to fulfill its obligation to serve its customers at just and reasonable rates, minimizing impacts to ratepayer bills. Staff reviewed the analysis and information HHP presented in its IRP filing on the rate and bill impacts from its planned resource portfolio and finds the *2023 HHP IRP* consistent with the rates discussion required in PUC Section 9621(b)(3).

HHP considered and performed cost modeling for four resource planning scenarios, as well as a "do nothing" scenario. HHP performed its additional analyses and provided the results reporting based on the lowest cost scenario, Scenario D, which they consider the most likely to be their preferred path moving forward. The IRP concludes that HHP, under Scenario D, will not require any significant investment in new renewable resources or other procurement until 2033. The IRP also highlights seasonal strategies in place to minimize costs and reduce exposure to price increases or spikes.

System and Local Reliability

SB 350 requires filing POU's to adopt an IRP that ensures system and local reliability and addresses resource adequacy requirements.¹³ Staff reviewed the *2023 HHP IRP* filing capacity reporting table and discussion and finds HHP planned for sufficient resources to maintain a reliable electric system. HHP's selected portfolio of resources also contains sufficient capacity to meet anticipated resource adequacy requirements in 2030. Staff finds this IRP consistent with the reliability requirements in PUC Section 9621(b)(3) and resource adequacy requirements in PUC Section 9621(d)(1)(E).

HHP is required to meet a System RA requirement of 15 percent above its forecasted monthly peak demand. The net qualifying capacity of the Hetch Hetchy hydroelectric system is 307 MW in all months except for September when it is 239 MW. This capacity is currently capable of fully meeting HHP's system resource adequacy requirement, including meeting its 15 percent PRM, and HHP expects the current generation portfolio to meet this requirement through 2030. After 2030 HHP expects load growth will require procuring additional resources to continue meeting its system resource adequacy requirement.

Local Capacity Needs

HHP does not own sufficient local capacity resources to meet its local resource adequacy requirement, which is typically about half of its system resource adequacy requirement, about 82 MW of local capacity. Traditionally, HHP has purchased local capacity from third party resources to meet this requirement. HHP is within the PG&E transmission access charge (TAC)

¹³ Public Utilities Code § 9621(b)(3); Public Utilities Code § 454.52(a)(1)(E).

area and anticipates procuring sufficient resources within a local reliability area within the PG&E TAC area to meet its local resource adequacy requirements.¹⁴

Flexible Capacity Needs

Currently, HHP does not own and operate generation able to meet the flexible resource obligation assigned to HHP by the California ISO each year and procures flexible generation to meet this requirement. HHP is considering long-term procurement of energy storage in its preferred scenario starting in 2027 to meet its flexible resource obligation in the future.

Transmission and Distribution Systems

PUC Section 9621(b)(3) requires filing POUs to adopt an IRP that achieves the goal of strengthening the diversity, sustainability, and resilience of the bulk transmission and distribution systems and local communities, as further specified in PUC Section 454.52(a)(1)(G).

Staff determines the *2023 HHP IRP* filing demonstrates plans to maintain and enhance its transmission and distribution systems and is planning for enough transmission to adequately deliver resources to its service area to meet the requirement as discussed above. Staff also finds that the *2023 HHP IRP* demonstrates progress toward increasing the reliability of its distribution system. As such, staff finds the IRP consistent with the transmission and distribution requirements set forth above.

Transmission System

HHP has adequate transmission to deliver power from its generation portfolio almost entirely composed of hydroelectric resources in the Sierra Nevada Mountains but is pursuing options to more directly and redundantly supply the distribution system delivering the power to its customers. HHP generation is delivered to HHP customers via 110 miles of 115 kilovolt (kV) and 50 miles of 230 kV transmission and four substations owned and operated by SFPUC with minimal congestion¹⁵ or constraints. SFPUC transmission interconnects with the California ISO system and relies on the PG&E distribution system to deliver power to HHP customers in San Francisco and the Peninsula. SFPUC is working with PG&E to create or upgrade interconnection

¹⁴ For background on load serving entity local resource adequacy compliance within the PG&E TAC, see [Report on the 2021-2023 Central Procurement Entity Framework](https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/resource-adequacy-homepage/resource-adequacy-compliance-materials/useful-resources/final-report-on-the-2021-2023-cpe-framework.pdf), <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/resource-adequacy-homepage/resource-adequacy-compliance-materials/useful-resources/final-report-on-the-2021-2023-cpe-framework.pdf>

¹⁵ Transmission congestion is the opportunity cost in dollars that occurs when transmission facilities reach the limit of their capacity to deliver power. A common example would be the cost of procuring more expensive power compared to cheaper power options unavailable due to transmission constraints.

points to allow the SFPUC transmission system to connect with HHP loads at higher voltage levels to facilitate delivering power independent of the PG&E distributions system. Recently, SFPUC completed interconnection of the Bay Corridor Transmission and Distribution Project which interconnects at a 230 kV distribution substation, providing a redundant energy source for the local distribution grid. SFPUC is evaluating options to reduce congestion and facilitate interconnection and transmission of energy in the east-west corridor between the City of Oakdale and Newark.

Distribution System

PG&E provides distribution service to most HHP customers, while HHP provides distribution service for new neighborhoods under redevelopment in San Francisco, such as Hunter's Point and Treasure Island. As these developments are completed, HHP will own and operate the distribution system providing service to these communities. SFPUC participates in Federal Energy Regulatory and California Public Utilities Commission proceedings to ensure distribution services provided to HHP customers and all San Francisco residents receive reliable and reasonably priced service.

Disadvantaged Communities and Localized Air Pollutants

HHP is making efforts to minimize localized air pollutants and GHG emissions with early priority on disadvantaged communities, consistent with the statutory requirements of Public Utilities Code Section 454.52 (a)(1)(I) established by SB 350.

HHP provides power to eight census tracts, and operates in the vicinity of four additional tracts, classified as disadvantaged communities for having an CalEnviroScreen score at the 76th or greater percentile ranking or having a pollution burden score in the top 25 percent of tracts. HHP provides primarily zero GHG emission energy to its customers with no localized air pollutants.

San Francisco worked with the state energy agencies to successfully close its polluting power powerplants in the Hunter's Point and Potrero Areas. With these two large projects closed in 2006 and 2011, there are no large-scale, fossil-fueled polluting power plants left in the city, and substantial efforts are ongoing and planned to clean up and redevelop these areas.

SFPUC recently decided to stop operating the 2 MW Southeast Cogeneration Plant in the disadvantaged Bayview/Hunter's Point area, which had produced localized air pollutants, primarily nitrogen oxide (NO_x). SFPUC is replacing the Southeast Cogeneration Plant with a new Biogas Utilization Facility, expected to come online in 2027, that will enhance biogas to natural gas quality to be compressed and injected into the natural gas system.

HHP's Community Assistance Program (CAP) provides a 30 percent discount for its income-qualified residential customers. HHP is reviewing CAP regarding affordability and arrearage management to ensure it meets customer affordability needs.

HHP also provides incentives for solar installations for low-income homeowners in disadvantaged communities that are no longer offered to other customers. HHP is in the process of developing new programs to support disadvantaged communities and other goals, including offering additional electric mobility incentive programs targeted at disadvantaged communities.

Net Energy Demand in Peak Hours

Senate Bill 338 (Skinner, Chapter 389, Statutes of 2017) requires POUs to consider an existing renewable generation portfolio, grid operation efficiency, energy storage, distributed energy resources, and energy reduction measures such as energy efficiency and demand response to reduce the need for new or additional gas-fired generation and distribution and transmission resources (PUC Section 9621(c)). Staff finds the *2023 HHP IRP* consistent with these requirements.

Currently, HHP's generation portfolio includes enough capacity available during peak demand to fully meet the peak load. HHP has 380 MW of hydroelectric generation which is typically able to meet its peak load of approximately 150 MW. HHP anticipates needing to supplement this generation in future years with additional generation and possibly storage to meet growing demand.

HHP's IRP modeling demonstrates the additional resource procurement described in its most likely and lowest cost resource scenario, Scenario D, paired with 75 MW nameplate, 63 MW net qualifying capacity (NQC) of 4-hour energy storage would be sufficient to meet its net peak demand through 2045. Resource Scenario D would mean procuring 100 MW nameplate, 6 MW NQC of southern California solar starting in 2033, and 50 MW nameplate, 48 MW NQC of geothermal starting in 2035.

Additional Procurement Goals

PUC Section 9621(d)(1) requires filing POUs to address procurement of energy efficiency and demand response, energy storage, transportation electrification, and a diversified portfolio, which are discussed in the next section. The resource adequacy provisions of this code section are discussed in the system reliability section above.

Energy Efficiency and Demand Response Resources

CEC staff finds the *2023 HHP IRP* consistent with the requirement in PUC Section 9621(d)(1)(A), as it includes a discussion of energy efficiency and demand response programs it plans to implement and measures the amount of energy efficiency savings it plans to

achieve. HHP expects 37.4 GWh of cumulative energy efficiency savings by 2030 compared to 2015,¹⁶ exceeding its SB 350 target of 37 GWh of cumulative savings.¹⁷

HHP primarily serves municipal departments, and its residential customers are limited to new developments in San Francisco. HHP residential efficiency programs are currently limited because its residential customers live in new buildings constructed under the latest code and energy efficiency standards. HHPs residential efficiency programs have still saved 50,000 MWh, about 5 percent of retail sales, and 2 million thermal units of natural gas each year. HHP does not currently offer a demand response program but may consider one in future years.

HPP generally tailors its commercial, industrial, and agricultural energy efficiency programs for each customer, which are mostly other city departments. These programs include:

- General Fund Program: Complete retrofit services and customized incentives for municipal departments.
- Civic Center Sustainability District: Green, renewable, and energy efficient technology demonstration projects to serve as national models for sustainability, including free energy audits, design, construction management, construction services, and full funding to buildings in the City's Civic Center historic district.
- Energy Benchmarking Program: Required annual benchmarking of non-residential buildings over 10,000 square feet and disclosure of building energy performance.
- Upgrade for Savings: Customized incentives and technical support for customers making significant upgrades to equipment, systems, and operational practices.
- Blueprint for Savings: Design assistance and payments to building owners and design teams planning to construct highly efficient buildings 50,000 square feet or larger.

Energy Storage

CEC staff finds HHP's discussion of the potential role of energy storage on its system consistent with the requirement in PUC Section 9621(d)(1)(B). This code also requires POUs to evaluate the potential of energy storage systems as a resource and establish procurement targets, if appropriate.

In response to the requirements of Assembly Bill 2514, SFPUC evaluated the potential to procure viable and cost-effective energy storage systems and determined no near-term need for energy storage except potentially for meeting local resource adequacy requirements.

16 HHP. July 21, 2025. [HHP Response to CEC Staff July 2025](https://efiling.energy.ca.gov/GetDocument.aspx?tn=264936&DocumentContentId=101709).
<https://efiling.energy.ca.gov/GetDocument.aspx?tn=264936&DocumentContentId=101709>

17 CEC. October 2017. [Revised SB 350 Doubling Energy Efficiency by 2030 Report](https://efiling.energy.ca.gov/GetDocument.aspx?tn=224615&DocumentContentId=5), pg. A-21.
<https://efiling.energy.ca.gov/GetDocument.aspx?tn=224615&DocumentContentId=5>.

SFPUC found energy storage for local resource adequacy was not cost effective in 2014 and continues to assess energy storage as a utility-scale option and for demonstration projects.

HHP has begun developing behind-the-meter energy storage projects to demonstrate local reliability benefits and maximizing solar resources. HHP currently has one solar plus battery storage project in operation, a second project expected to start construction, and a third project in design phase.

HHP considers the cost effectiveness of energy storage to be bolstered by recent increases in resource adequacy capacity prices, price volatility in California ISO energy markets, and unavailability of renewable resources due to curtailments. Energy storage could increase utilization of HHP hydroelectric generation, particularly in March, April and May when spring runoff coincides with increased solar generation within the California ISO system.

HHP does not recommend an energy storage procurement target in the 2023 IRP but plans to engage with energy storage developers, continue assessing energy storage options and include these results in its subsequent IRP. HHP's 2023 IRP modeling assumes their most likely and cost-effective generation resource scenario paired with 75 MW nameplate, 63 MW NQC of battery storage starting in 2027.

Transportation Electrification

CEC staff finds the *2023 HHP IRP* consistent with the requirements of PUC Section 9621(b)(4) and (d)(1)(C) as it addresses transportation electrification, projecting for the growth of transit electrification. HHP considers the load impact of increasing transportation electrification to ensure adequate generation supporting the transition. Anticipated growth of fleet electrification, onshore power service and customer vehicle electrification are considered in development of HHP's demand forecast. HHP has adopted electric rates to support its vehicle electrification programs.

HHP provides 100 percent renewable and GHG emission free power to the SFMTA, which operates the nation's largest fleet of electric public transit. SFMTA currently uses 65,000 MWh per year and this is expected to increase as SMFTA plans to upgrade six bus yards and fleets to accommodate 100 percent electric battery-powered bus operation by 2040. HHP provides onshore power for ships docked at the Port of San Francisco that would otherwise use diesel generation.

HHP provides incentives and technical assistance to support customer vehicle electrification. EV Charge SF helps developers comply with San Francisco's EV Readiness Ordinance, which requires a certain percentage of parking spots for new buildings or significant alterations to be EV charger ready. HHP provides developers incentives for EV chargers and other related costs.

HHP has developed a stand-alone EV charging rate for customers with stand-alone charging units, although no customers currently qualify. HHP will gather and analyze data related to this rate as customers become eligible. HHP is developing a new electric mobility incentive program targeted at disadvantaged communities.

Portfolio Diversification

PUC Section 9621(d)(1)(D) requires that POUs address the procurement of a diversified portfolio of resources consisting of both short-term and long-term electricity, and demand-response products. Currently, HHP owns and operates significant hydroelectric generation fully capable of meeting its peak demand but procures other resources to meet local capacity and flexibility requirements. HHP expects the current approach to provide sufficient resource adequacy through 2030, after which long-term procurement of new renewable resources and battery storage are anticipated.

HHP analyzed four renewable resource scenarios to support portfolio diversification, projected load growth and environmental objectives. HHP's resource scenarios considered different mixes of northern California solar, southern California solar, onshore wind, Humboldt area offshore wind, Morro Bay offshore wind, geothermal, and battery storage. Each scenario is intended to deliver approximately 425 to 700 GWh per year supply from renewable energy resources with complimentary seasonal production characteristics.

APPENDIX A:

Abbreviations

Abbreviation	Term
BESS	Battery Energy Storage System
California ISO	California Independent System Operator
CARB	California Air Resources Board
CEC	California Energy Commission
DER	Distributed Energy Resource
EV	Electric vehicle
GHG	Greenhouse gas
HHP	Hetch Hetchy Power
IRP	Integrated resource plan
ISO	Independent System Operator
MTCO ₂ e	Metric tons of carbon dioxide equivalent
MW	Megawatt
MWh	Megawatt-hour
POU	Publicly owned utility
PUC	Public Utilities Code
RPS	Renewables Portfolio Standard
SB 350	Senate Bill 350 (De León, Chapter 547, Statutes of 2015)
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission

APPENDIX B:

Glossary

Term	Definition
California Air Resources Board (CARB)	The "clean air agency" in California government. CARB's main goals include attaining and maintaining healthy air quality, protecting the public from exposure to toxic air contaminants, and providing innovative approaches for complying with air pollution rules and regulations.
California Energy Commission (CEC)	The state agency established by the Warren-Alquist State Energy Resources Conservation and Development Act in 1974 (Public Resources Code, Sections 25000 et seq.) responsible for energy policy. The Energy Commission's seven major areas of responsibilities are: • Forecasting statewide energy demand. • Licensing of power plants and transmission lines sufficient to meet those needs. • Promoting energy conservation and efficiency measures. • Promoting the development of renewable energy. • Promoting the transition to clean transportation fuels. • Investing in energy innovation. • Planning for and supporting the state's response to energy emergencies. Funding for the Commission's activities comes from the Energy Resources Program Account, Federal Petroleum Violation Escrow Account, and other sources.
Demand forecast	A forecast of electricity demand served by the electric grid, measured by peak demand and energy consumption. Some factors that determine load forecast include economics, demographics, behind-the-meter resources, and retail rates.
Demand response	Providing wholesale and retail electricity customers with the ability to choose to respond to time-based prices and other incentives by reducing or shifting electricity use, particularly during peak demand periods, so that changes in customer demand become a viable option for addressing pricing, system operations and reliability, infrastructure planning, operation and deferral, and other issues.

Term	Definition
Distributed energy resources	Small-scale power generation technologies (typically in the range of 3 to 10,000 kilowatts) located close to where electricity is used (for example, a home or business) to provide an alternative to or an enhancement of the traditional electric power system.
Greenhouse gas (GHG)	Any gas that absorbs infra-red radiation in the atmosphere. Greenhouse gases include water vapor, carbon dioxide (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), halogenated fluorocarbons (HCFCs), ozone (O ₃), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs).
Integrated resource plan (IRP)	A plan adopted by the governing board of a POU under PUC Section 9621.
IRP filing	An IRP adopted by the filing POU's governing board that is electronically submitted to the Energy Commission, along with the standardized tables and supporting Information, by the filing POU or authorized representative.
Public Utilities Code (PUC)	The set of laws that regulates public utilities in California, including natural gas, telecommunications, private energy producers, and municipal utility districts.
Renewables Portfolio Standard (RPS)	A regulation that requires a minimum procurement of energy from renewable resources, such as wind, solar, biomass, and geothermal.
Senate Bill 350 (De León, Chapter 547, Statutes of 2015)	Also known as the Clean Energy and Pollution Reduction Act, this bill established clean energy, clean air, and greenhouse gas reduction goals, including reducing greenhouse gas to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050. The California Energy Commission is working with other state agencies to implement the bill.
Standardized Tables	The four tables that are required with the IRP filing submitted to the Energy Commission. These tables include information and data necessary to help staff determine if the IRP is consistent with PUC Section 9621. The four standardized tables are Capacity Resource Accounting Table (CRAT), Energy Balance Table (EBT), Renewable Procurement Table (RPT), and Greenhouse Gas Emissions Accounting Table (GEAT).
Zero-emission resources	An engine, motor, process, or other energy source, that emits no waste products that pollute the environment or disrupt the climate.