DOCKETED	
Docket Number:	18-IRP-01
Project Title:	Integrated Resource Plan
TN #:	260490
Document Title:	Review of City of Burbank Water and Power 2024 Integrated Resource Plan
Description:	N/A
Filer:	TJ Singh
Organization:	California Energy Commission
Submitter Role:	Commission Staff
Submission Date:	12/5/2024 9:55:33 AM
Docketed Date:	12/5/2024

CALIFORNIA ENERGY COMMISSION

CALIFORNIA NATURAL RESOURCES AGENCY

California Energy Commission

STAFF REPORT

Review of City of Burbank Water and Power 2024 Integrated Resource Plan

November 2024 | CEC-200-2024-019

California Energy Commission

Bryan Neff
Primary Author

Elise Ersoy
Program and Project Supervisor
RELIABILITY & EMERGENCY UNIT

Liz Gill
Branch Manager
RELIABILITY ANALYSIS BRANCH

Aleecia Gutierrez
Director
ENERGY ASSESSMENTS DIVISION

Drew Bohan
Executive Director

ACKNOWLEDGEMENTS

The California Energy Commission appreciate the contributions from the following staff:

California Energy Commission

Brian McCollough

Usman Muhammad

Ingrid Neumann

Charles Smith

ABSTRACT

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) 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. City of Burbank Water and Power submitted its *2024 Integrated Resource Plan* and supplemental information for review on December 8, 2023. The City of Burbank Water and Power Integrated Resource Plan filing includes detailed technical analysis performed in partnership with a consultant and was developed with input from a public stakeholder process. This staff paper presents the results of the California Energy Commission staff review of the City of Burbank Water and Power 2024 Integrated Resource Plan.

Keywords: Publicly owned utility, integrated resource plan, City of Burbank Water and Power, demand, resources, portfolio, generation, transmission, distribution, Renewables Portfolio Standard, forecast, energy efficiency, transportation electrification, demand response, greenhouse gas, GHG, emissions, system reliability

Please use the following citation for this report:

Neff, Bryan, Brian McCollough. 2024. *Review of City of Burbank Water and Power 2024 Integrated Resource Plan*. California Energy Commission. Publication Number: CEC-200-2024-019.

TABLE OF CONTENTS

LIST OF TABLES

EXECUTIVE SUMMARY

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) requires publicly owned utilities with an annual electrical demand exceeding 700 gigawatt-hours to adopt an integrated resource plan (IRP). Those plans must meet certain requirements, targets, and goals, including greenhouse gas emission reduction targets and renewable energy procurement requirements identified under Public Utilities Code Section 9621. The California Energy Commission's (CEC's) *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines* require the utilities to file an IRP with data and supporting information sufficient to demonstrate that they meet these requirements and the targets and planning goals from 2018 to 2030. Under PUC Section 9622, the CEC must review the IRPs for consistency with the requirements of PUC Section 9621.

City of Burbank Water and Power (BWP) is a vertically integrated municipal utility owned and operated by the City of Burbank as a not-for-profit that generates, transmits, and distributes power to its customers at cost.

BWP has a goal to provide reliable and cost-competitive electricity to its residential and commercial customers, while transitioning to clean energy. BWP plans to meet the 60 percent Renewables Portfolio Standard goal in 2030 and the zero-carbon goal by 2040. BWP's resource planning process includes a focus on decarbonization strategies while meeting statutory and regulatory requirements for reliability, greenhouse gas emissions, renewable portfolio standard requirements, transportation electrification, and energy efficiency. To meet its renewable energy and zero-carbon goals, BWP developed a series of planning scenarios, with extensive focus on two of them. The first scenario focuses on:

- **Proven clean technologies**: Use of carbon-free technologies available at utility-scale today, including solar, wind, geothermal energy, and battery storage.
- **New transmission to reach new renewable resource areas:** New high-voltage transmission would expand the possibility of bringing generation from new wind and solar facilities built in Arizona and New Mexico.
- **Repowering of Intermountain Power Plant (IPP)**: IPP will switch fuels from coal-fueled to natural gas-fueled. BWP modeling includes IPP switching fuels again in 2030, from natural gas to hydrogen. The hydrogen would be generated through electrolysis powered by solar photovoltaics.
- **Repowering of natural gas plants in the Los Angeles Basin area**: Switching fuels for BWP-owned combustion turbines from natural gas to hydrogen. The hydrogen would be generated through electrolysis powered by solar photovoltaics.

In the second scenario, BWP focuses on:

- **Proven clean technologies**: Use of carbon-free technologies available at utility-scale today, including solar, wind, geothermal energy, and battery storage.

- **Small modular reactor:** Contracting with a small modular nuclear reactor outside California that would provide reliable base load energy.
- **Repowering of IPP**: IPP will switch fuels from coal-fueled to natural gas-fueled. BWP modeling includes IPP switching fuels again in 2030, from natural gas to hydrogen. The hydrogen would be generated through electrolysis powered by solar photovoltaics.
- **Repowering of natural gas plants in the Los Angeles Basin**: Switching fuels for BWP-owned combustion turbines from natural gas to hydrogen. The hydrogen would be generated through electrolysis powered by solar photovoltaics.

In reviewing the BWP IRP and determining consistency with the requirements of PUC Section 9621, CEC staff relied on the four standardized reporting tables and narrative descriptions in the IRP 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:* The utility plans to meet the greenhouse gas emission reduction requirements of PUC Section 9621(b)(1) and the renewable energy procurement requirement of PUC Section 9621(b)(2).
- *Meeting Planning Goals:* The utility intends to meet planning goals related to retail rates, reliability, transmission and distribution systems, as set forth in PUC Section 9621(b)(3).
- *Considering Peak Needs:* The utility has considered the role of existing renewable generation, grid operational efficiencies, energy storage, and distributed resources (including energy efficiency) 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).
- *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).

CHAPTER 1:
Demand Forecast and Procurement

Introduction

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) (SB 350) requires publicly owned utilities (POU) with an annual electrical demand exceeding 700 gigawatt-hours (GWh) 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]

Further, Public Utilities Code (PUC) Section 9622 requires the California Energy Commission (CEC) to review POU IRPs to ensure they achieve PUC Section 9621 provisions.[3] 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* (POU IRP Guidelines) to govern the submission and review of the POUs' IRPs.[4]

This chapter outlines the CEC's review process and provides an overview of the City of Burbank Water and Power (BWP) and its IRP development process. In addition, the chapter addresses the POU IRP Guidelines requirements that POUs provide a demand forecast and a procurement plan as part of its IRP.

City of Burbank Water and Power

BWP is a vertically integrated municipal utility owned and operated by the City of Burbank as a not-for-profit that generates, transmits, and distributes power to its customers at cost. The City of Burbank is home to many film and animation studios, many smaller businesses, and about 105,000 people who depend on reliable and cost-competitive electric service. BWP serves about 46,290 residential, 6,880 commercial, and 82 large commercial accounts.

---

1 PUC Section 9621.

2 PUC Article 16 (commencing with Section 399.11) of Chapter 2.3 of Part 1 of Division 1.

3 PUC Section 9622.

4 *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines*, https://www.energy.ca.gov/publications/2022/publicly-owned-utility-integrated-resource-plan-submission-and-review-guidelines.

In compliance with SB 350, BWP filed its initial IRP with the CEC in 2019, which was found consistent with SB 350 and the requirements of PUC Section 9621.

BWP developed its 2024 IRP with public input and the help of a technical contractor. BWP engaged with the public throughout its IRP process, which included a stakeholder technical advisory group, an IRP website, four community meetings, and a community survey with a robust response (952 responses from members of the public).

Black & Veatch Management Consulting, LLC, performed the detailed technical analysis. This analysis included creating a production cost model, seven planning scenarios spanning a 25-year period (2023 through 2047), and an extended study of two of the preferred scenarios. On December 5, 2023, the City of Burbank approved the 2024 BWP IRP.[5]

Demand Forecast

The POU IRP Guidelines (Chapter 2.E.1) 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.[6] The POU IRP 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.[7] The demand forecast and supporting information provided present an adequate representation of future energy and peak demand that meets the POU IRP Guidelines requirements.

Energy and Peak Forecast Method and Assumptions

BWP used a multistep process to forecast its demand. This process compiles the gross energy demand of residential, commercial, future development, and electric vehicles, then subtracts energy efficiency and distributed generation to yield its net energy demand. Residential and commercial energy demand used historical data and applied separate compound annual growth rates to calculate future demand. New developments are included with a historical load factor and chance of success before being phased in over a seven-year period.

Electric vehicle demand is based on a blend of the CEC's *2022 Integrated Energy Policy Report Update (2022 IEPR Update)* Additional Achievable Transportation Electrification (AATE) scenarios. BWP blended three transportation scenarios together to account for the electric vehicle adoption, a rate that is anticipated to increase over time.

BWP's energy efficiency savings was developed using data taken from the CEC's *2022 IEPR Update* Additional Achievable Energy Efficiency (AAEE) Scenario 3. BWP's additional distributed generation, beyond what is already present in the city, was based on data taken from the CEC's *2022 IEPR Update* baseline forecast. The *2022 IEPR Update* baseline forecast annual

5 Burbank Water and Power 2024 Integrated Resource Plan: https://www.burbankwaterandpower.com/2024-irp.

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

7 The most recently adopted demand forecast is for the California Energy Demand Forecast 2023–2040.

distributed generation data was available only through 2035; therefore, BWP extrapolated it through the end of the planning horizon using the same method used for the AATE data.

BWP used a regression model to develop the annual peak demand values for BWP's nonelectric vehicle gross energy demand, composed of residential, commercial, and nonelectric vehicle development demands. The 2018 energy demand profile was used as BWP found 2018 to be the most weather "normal" year based on historical data.

Electric vehicle energy demand was modeled using a separate regression because of the drastically different hourly demand profile. The *2022 IEPR Update* electric vehicle hourly demand profile for the California Independent System Operator planning scenario was scaled down to match BWP's forecast electric vehicle demand. Scenario 3 from the *2022 IEPR Update* AAEE and Additional Achievable Fuel Substitution forecasts was used in conjunction with the *2022 IEPR Update* AAEE Hourly Impacts forecast to create the hourly energy efficiency forecast for the entire planning horizon.

An hourly solar generation profile for the Los Angeles area was used together with the annual distributed generation forecast described above to create the hourly contributions from distributed generation within the City of Burbank. All these demand profiles were then combined on an hourly basis to create the final hourly demand forecast.

The forecast from 2023 to 2047 assumes that demand will return to "pre-COVID" levels and will increase largely due to new residential and commercial developments and the increasing adoption of electric vehicles. This increased demand is spread across all hours, including peak demand. The effect of the adoption of electric vehicles is particularly evident in winter, where the peak is shifted toward the overnight hours due to electric vehicle charging. BWP's forecast net energy demand is estimated to increase from 1,004 GWh in 2023 to 1,334 GWh in 2030. BWP's forecast net-energy peak demand is estimated to increase from 277 MW in 2023 to 323 MW in 2030.

Resource Procurement Plan

The POU IRP 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 goals. Staff has determined that BWP's IRP filing meets these requirements. The following is a discussion of the utility's existing resources, procurement strategy, the portfolio analysis underlying resource selections, and the resources in 2030 identified in the standardized reporting tables.

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

Existing Resources

BWP has a diverse range of resources in its existing resource portfolio. BWP owns part of two natural gas-fired generation facilities, Magnolia and Lake 1. BWP is in long-term contracts with two wind facilities (Milford I and Pebble Springs), two solar PV facilities (Copper Mountain and Desert Harvest Solar), small hydroelectric (Tieton), geothermal (Don Campbell I), nuclear (Palo Verde), a generator powered by landfill gas (Ameresco), and large hydroelectric (Hoover Dam). BWP also contracts with Intermountain Power Project (IPP), which is fueled by coal but is transitioning to natural gas in 2025. BWP holds transmission access rights to capacity on the Southern Transmission System, a high-voltage direct current line that connects from IPP in Utah to Southern California. This transmission line access is highly valued as it provides the opportunity to access Renewable Portfolio Standard (RPS)-eligible energy from new renewable generation developments in Utah in the future.

Resource Portfolio Evaluation

BWP submitted standard tables for its two preferred scenarios: "New Tx & PPAs" and "SB1020+SMR." The first scenario refers to building new transmission and signing new renewable generation power purchase agreements, and the second scenario refers to Senate Bill 1020 (Laird, Chapter 361, Statutes of 2022) (SB 1020) and acquiring power from a small modular reactor. SB 1020 revised state emission targets so eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035; 95 percent by December 31, 2040; and 100 percent by December 31, 2045.[9] The two scenarios have much in common. The discussion below details the common elements of the scenarios, then the uniqueness.

BWP plans for a mix of transitioning its natural gas-fueled facilities to hydrogen fuel and procuring a mix of renewable resources (solar, wind, and geothermal). BWP replaces the fuel of its utility owned natural gas generation facilities with hydrogen in 2035. IPP is undergoing a fuel switch from coal to natural gas, a transition that will be complete by 2025. BWP assumes that this facility will again switch fuels in 2035, this time transitioning from natural gas to hydrogen. The hydrogen for BWP's owned and contracted facilities will come from electrolysis powered by solar PV, contributing heavily to both its GHG reduction and RPS targets. The timing of the resource fuel transitions from natural gas to hydrogen plays a major role in BWP's estimated GHG emissions. The implications of this transition are discussed in Chapter 2 under "Greenhouse Gas Emission Reduction Targets."

BWP plans a 3 MW solar plus storage facility in Burbank to come on-line in 2027. BWP plans to use its transmission rights on the Southern Transmission System to import solar and geothermal power from projects in Utah starting in 2027. Some of BWP's long-term RPS eligible contracts expire in 2026, 2028, and 2033.

9 PUC Section 454.53(a).

The interim years of 2025 to 2027 fall short of capacity requirements. This situation is rectified in 2028 and for the remainder of the forecast period (through 2047). BWP has an agreement with Los Angeles Department of Water and Power (LADWP) that calls for BWP to pay LADWP to meet all of BWP's reserve obligations. The shortfall in these years is 41 MW, 60 MW, and 5 MW, respectively. These capacities as a percentage of forecasted peak demand are 14 percent, 19 percent, and 2 percent, respectively. The main reason for the shortfall in capacity is that IPP will have a smaller nameplate capacity when it converts to natural gas. Resource additions in 2027 and 2028 reduce and then eliminate this shortfall. Any potential shortfall during these years will be purchased by BWP through its LADWP agreement. Despite this slight capacity shortfall, BWP's resource portfolio meets its net-energy requirements in all years of the forecast. Beyond this, the scenarios differ as to how BWP plans to address additional resource procurement.

In the first scenario, "New Tx & PPAs," BWP relies on new solar, wind, and geothermal resources, some of which require new transmission to connect BWP to resources in New Mexico and Arizona. Solar resources are procured in LADWP territory and PacifiCorp East, coming on-line in 2028, and Arizona Power System, coming on-line in 2033.[10] Wind energy carried by the new transmission to New Mexico and Arizona is planned for 2035. Additional resources procured in 2035 include solar plus storage in California, as well as geothermal in California.

In the second scenario, "SB1020+SMR," BWP relies primarily on new solar and battery resources and a small modular reactor. BWP has new solar resources coming on-line in 2028 in LADWP and Southern California Edison territory, followed by a 24 MW hybrid solar-plus-storage facility and a 2 MW stand-alone battery storage system in LADWP territory coming on-line in 2030. BWP assumes that it will be able to procure a purchased power contract for 25 MW of capacity from a small modular reactor starting in 2030. Small additions of hydrogen powered combustion turbine capacity are added near the end of the forecast to add peaking power and compliment the baseload power from the nuclear facility. These additions are sourced from LADWP and PacifiCorp East, and added in 2042 and 2044, respectively.

Procurement Strategy

BWP is transitioning away from fossil-fueled resources to renewable and carbon emission-free resources. BWP's near-term strategy is to take advantage of IPP's transition from being coal-fueled to natural gas-fueled, a process that is underway. Both scenarios rely on new solar resources and solar plus storage resources, as well as sourcing renewable energy in Utah, made possible by its existing transmission rights. These near-term plans provide the basis for exploring the two scenarios submitted.

10 PacifiCorp East is a balancing authority spanning Utah, eastern Idaho, and western Wyoming. Arizona Power System is a balancing authority in central and southwestern Arizona.

Both scenarios, "New Tx & PPAs" using new transmission and "SB1020+SMR" using a small modular reactor, meet the 60 percent RPS by 2030, 90 percent carbon-free resources by 2035, and 100 percent zero-emissions by 2040 targets. However, implementing these long-term plans is based on the availability of technology and ability to secure additional transmission service agreements with LADWP. BWP recognizes the challenges of meeting the goal of having 100 percent zero-carbon resources and its reliance on not-yet commercially available technologies: "Some of these energy technologies have not reached high levels of developmental maturity or have not yet seen widespread adoption. Risks associated with the delayed deployment of these necessary technologies could impact the planning forecasts in this IRP and the ability of BWP to achieve its stated emissions reduction goals in a timely and cost-effective way."[11] In addition, these plans to transition to clean energy come at significant cost, a topic discussed in the next chapter under "Retail Rates."

11 Burbank Water and Power 2024 Integrated Resource Plan, pgs. 2-8.

CHAPTER 2:
Review for Consistency with PUC Section 9621 Requirements

This chapter summarizes the main elements of BWP's 2024 IRP and provides staff's findings regarding the consistency of the IRP filing with PUC Section 9621 requirements, as well as the POU IRP Guidelines. These findings include whether the utility meets 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, 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 CPUC.[12] 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 brought into alignment with CARB's *2022 Scoping Plan for Achieving Carbon Neutrality* (2023 CARB Update) adopted in September 2023.[13,14] This electricity sector GHG planning target range of 30–38 million metric tons of carbon dioxide equivalent ($MMTCO_2e$), retains the lower bound of 30 $MMTCO_2e$ from CARB's *2020 Update* but reduces the upper bound from the 53 $MMTCO_2e$ to 38 $MMTCO_2e$ found in the *2020 Update*. [15]

The 2020 planning target range for the City of Burbank was 129,000–228,000 metric tons of carbon dioxide equivalent ($MTCO_2e$), while the 2023 planning target range is 129,000-163,000 $MTCO_2e$. The 2023 CARB Update was published after BWP completed its 2024 IRP analysis. BWP's modeled scenarios used the 2020 CARB GHG target and the corresponding results are reported on the GHG emissions accounting in the standardized reporting tables. The GHG emissions associated with BWP's two preferred scenarios, Scenario 1 and Scenario 2, are summarized in **Table 1** and **Table 2**, respectively.

12 PUC Section 9621(b)(1).

13 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.

14 CARB's *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.

15 CARB's *Senate Bill 350 Integrated Resource Planning Electricity Sector Greenhouse Gas Planning Targets: 2020 Update*, https://ww2.arb.ca.gov/sites/default/files/2021-04/sb350-final-report-2020.pdf.

Table 1: Greenhouse Gas Emissions from BWP Resource Portfolio, Scenario 1

Power Source	Fuel Type	GHG Intensity (MT CO2e/MWh)	Total Emissions (MT CO2e) 2023	Total Emissions (MT CO2e) 2025	Total Emissions (MT CO2e) 2030
Magnolia	Natural Gas	0.39	176,000	163,000	116,000
Lake 1	Natural Gas	0.67	4,000	42,000	8,000
Intermountain Power Plant	Coal	0.88	163,000	28,000	NA
Intermountain Power Plant	Natural Gas	0.35	NA	41,000	63,000
Net Spot market purchases (sales)	System	0.428	45,000	82,000	14,000
Total Portfolio Emissions	**NA**	**NA**	**388,000**	**356,000**	**201,000**

Source: CEC, Energy Assessments Division, based on BWP 2024 IRP filing

Scenario 1, associated with new transmission and relies on new out-of-state renewable generation, has an estimated total portfolio emissions of 201,000 $MTCO_2e$. This amount is within the 2020 planning target cap for the City of Burbank of 228,000 $MTCO_2e$ but exceeds the 2023 planning target cap of 163,000 $MTCO_2e$.

Table 2: Greenhouse Gas Emissions from BWP Resource Portfolio, Scenario 2

Power Source	Fuel Type	GHG Intensity (MT CO2e/MWh)	Total Emissions (MT CO2e) 2023	Total Emissions (MT CO2e) 2025	Total Emissions (MT CO2e) 2030
Magnolia	Natural Gas	0.39	176,000	163,000	46,000
Lake 1	Natural Gas	0.67	4,000	42,000	7,000
Intermountain Power Plant	Coal	0.88	163,000	28,000	NA
Intermountain Power Plant	Natural Gas	0.35	NA	41,000	52,000
Net Spot market purchases (sales)	System	0.428	45,000	82,000	1,000
Total Portfolio Emissions	**NA**	**NA**	**388,000**	**356,000**	**106,000**

Source: CEC, Energy Assessments Division, based on BWP 2024 IRP filing

Scenario 2, associated with a small modular reactor, has an estimated total portfolio emissions of 106,000 $MTCO_2e$. This amount is below the low end of both the 2020 planning target range and the 2023 planning target range for the City of Burbank of 129,000 $MTCO_2e$. While the updated and reduced electricity sector GHG emission targets were adopted subsequent to BWP's 2024 IRP filing, both of BWP's preferred scenarios meet the 2020 CARB GHG target range, and Scenario 2 also meets the 2023 CARB GHG target range.

CEC staff reviewed the GHG emissions associated with BWP's portfolio of resources in 2030, as identified in its IRP and standardized reporting tables. Staff independently assessed the

emission factors associated with various resources in BWP's portfolio to ensure consistency with other data available to staff. Staff finds that BWP plans to achieve the CARB-established GHG emission target range of 30–38 MMT CO_2e. BWP's resource portfolio results in roughly 106,000 $MTCO_2e$, consistent with the requirement of PUC Section 9621(b)(1).

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 of Part 1 of Division 1 of the PUC. In 2018, Senate Bill 100 (De León, Chapter 312, Statutes of 2018) increased the RPS requirement for 2030 from 50 to 60 percent.[16] Staff reviewed the renewable procurement table, the discussion in the IRP filing, and the renewable procurement plan submitted. Staff finds that BWP's plans are consistent with the RPS procurement requirements and all interim compliance periods, as well as the requirements of PUC Section 9621(b)(2).

BWP's renewable procurement plans include additions of new renewable resources starting in 2027, and BWP anticipates that RPS-eligible renewables will exceed the required 60 percent of retail sales in 2030.

Retail Rates

SB 350 (PUC Section 9621[b][3]) requires POUs 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, as required in PUC Section 454.52 (a)(1)(C)-(D). Staff reviewed the analysis and information BWP presented in its IRP filing on the rate and bill impacts from different resource portfolios they evaluated. Staff finds the BWP IRP is consistent with the rates discussion, as required in PUC Section 9621(b)(3).

BWP has also developed short-term as well as long-term energy procurement strategies to reduce price risks and volatility. To do this, BWP maintains and regularly updates a financial and demand forecast model that looks forward 10 years to help plan power supply needs and rate adjustments. For this IRP, BWP modeled the rate impact analysis for each of the seven supply forecast scenarios.

To design just and reasonable rates, BWP uses a cost-of-service analysis to determine each customer class's fair share of the annual revenue requirement and to inform rate design. BWP has five major customer classes: residential, small commercial, medium commercial, large commercial, and extra-large commercial. Street lighting is also included as a separate class. Once the class cost of service is determined for each customer class, rates can be designed to recover that amount.

16 PUC Section 399.11(a).

BWP believes electric rates should be designed to reflect the impacts of when and how costs are incurred to send appropriate price signals. Currently, all commercial customers are subject to time-of-use energy charges. BWP believes that time-of-use rates are a useful demand side management tool for reducing overall system costs. Special customer rates are available for residential service including service for lifeline customers and electric vehicle owners. BWP's residential electric rates remain among the lowest in the region including other municipal utilities, as well as investor-owned utilities.

BWP highlights the challenges of achieving 100 percent zero-carbon energy while keeping rates affordable for its customers. Under the "New Tx & PPAs" scenario the average bill would increase by 4.03 percent annually, or be 158 percent higher in 2047 than what the average bill is currently. Under the "SB1020+SMR" scenario, the average bill would increase by 4.96 percent annually, or be 213 percent higher in 2047 than what the average bill is currently. As a point of reference, if rates were increased by 2 percent per year to keep pace with general inflation, customer bills in 2047 would only be 67 percent higher than they are today.

During the City of Burbank's city council meeting where BWP's 2024 IRP was presented and approved, customer billing rates and impact were discussed with great concern. City council members questioned the ability of ratepayers to keep up with bills that increase at a rate higher than inflation for two decades, as BWP staff highlighted the reality of the investment costs required to transition to clean energy resources. City council members questioned if these plans were fiscally attainable without causing significant duress to ratepayers. BWP staff noted that time had passed since the IRP modeling occurred and costs had increased more than what was initially estimated, meaning that the average billing estimates are a low-end estimate of what the actual costs may be. City council members and BWP staff all agreed that state and federal investment and financial support will be essential for BWP to successfully transition away from fossil fuels to clean energy resources.

System and Local Reliability

SB 350 requires filing POUs to adopt an IRP that ensures system and local reliability and addresses resource adequacy requirements.[17] Staff reviewed the BWP 2024 IRP filing capacity reporting table and discussion and finds that BWP has planned for sufficient resources to maintain a reliable electric system. In addition, BWP's selected portfolio of resources contains sufficient capacity to meet anticipated resource adequacy requirements in 2030. Staff finds that the IRP is consistent with the SB 350 reliability requirements in PUC Section 9621(b)(3) and resource adequacy requirements in PUC Sections 9620 and 9621(d)(1)(E).

17 PUC Section 9621(b)(3).

System Reliability

BWP is a member of LAWDP Balancing Authority. Bulk transmission and system reliability is at higher voltage than exists on BWP's distribution system and is the responsibility of LADWP. In 2015, BWP reached an agreement with LADWP that will have BWP paying LADWP to meet all of BWP's reserve obligations instead of using BWP's own assets and limited market access to provide for the reserves. BWP's reserve obligations are 40 MW of spinning capacity and 40 MW of supplemental capacity for a total of 80 MW of reserve capacity. This represents a reserve margin greater than 20 percent of BWP's peak demand in 2030 of 323 MW.

Local Capacity Needs

The City of Burbank has enough capacity from its local natural gas resources to meet its local capacity needs. BWP has a balancing authority area service agreement with LADWP, through which BWP has the option to procure backstop capacity when needed.

Flexible Capacity Needs

BWP's Lake 1 and Magnolia Power Project are expected to be on-line through the planning period to provide flexible capacity. Intermountain Power Project's switch from coal-fueled to natural gas-fueled will increase ramping rates and flexible capacity abilities.

BWP plans for a 3 MW solar plus storage project located at the Burbank Airport to come on-line in 2027, which will allow BWP control over this 4-hours storage resource and add local flexible capacity. In future procurement of solar resources, BWP plans to include storage with 50 MW of new solar PV, which will also provide additional flexible capacity.

Transmission and Distribution Systems

SB 350 (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 determined that the BWP 2024 IRP filing demonstrates plans to maintain and enhance its transmission and distribution systems. Staff finds that BWP is planning for enough transmission to adequately deliver resources to its service area to meet the requirement as discussed below. Staff also finds that the BWP 2024 IRP demonstrates progress toward increasing the capacity and reliability of its distribution system. As such, staff finds the IRP is consistent with the transmission and distribution requirements set forth above.

Transmission System

BWP is a member of the LADWP Balancing Area. As such, bulk transmission (that is, above 69 kV) is the responsibility of the LADWP. Accordingly, bulk transmission system reliability is not a Burbank responsibility outside operating its electric system and resources in accordance with the conventions established by the Western Electricity Coordinating Council and commonly accepted utility practices.

BWP has transmission rights to lines outside LADWP, which allow it to access resources outside the City of Burbank. The City of Burbank has historically worked with the Southern California

Public Power Authority and other entities to participate in major new transmission projects so that BWP can move power from generation facilities, or other entities, throughout the western United States. One of these lines, the Southern Transmission System, which connects to Utah, will be key to accessing additional renewable energy resources outside BWP.

BWP designed its baseline forecast so it could meet its forecasted needs through the study period (2047) without new transmission lines, though transmission expansion was included in preferred Scenario 1. As more renewable energy is added or replaced or both, it may be necessary to acquire additional transmission service or participate in the development of new transmission lines. Because of the long development periods necessary for such acquisitions or upgrades, BWP will continue to monitor its transmission margins on an ongoing basis to ensure future shortfalls do not occur.

Distribution System

BWP provides the City of Burbank with electrical service through a distribution network that includes electric substations, subtransmission lines, distribution lines, and transformers. BWP monitors its electric system performance to measure and maintain electric reliability. BWP has a long-term vision and approach to maintenance planning, carefully tracking and replacing distribution assets when they near the end of the anticipated operational life. This approach allows BWP to maintain its high availability rate to customers while maintaining reliability.

BWP is updating distribution lines and substations from 4 kV to 12 kV. This update allows BWP to deliver three times as much energy, reducing power losses in the system and improving reliability. The 12 kV substations are served primarily from the 34.5 kV systems. BWP is upgrading the 34.5 kV systems to 69 kV system where possible, allowing BWP to realize additional efficiency and reliability.

BWP's grid modernization has enhanced its distribution system with advanced technology including digital meters, energy storage, renewable energy sources, and other improvements. These improvements have allowed BWP to better analyze and understand load growth, circuit loading, and power quality. This improved understanding, in turn, has allowed BWP to make targeted improvements in BWP's distribution system and helped with better sizing of transformers. These improvements and actions have improved system performance and operational characteristics and increased system reliability during times of high load. BWP also uses these enhanced data to provide numerous benefits to customers, such as supporting a larger penetration of sustainable, customer-owned DER and empowering customers with information about their energy consumption.

Disadvantaged Communities and Localized Air Pollutants

BWP is making efforts to minimize localized air pollutants and GHG emissions with early priority on disadvantaged communities, consistent with the statutory requirements of PUC Section 454.52(a)(1)(I) established by SB 350. BWP's IRP includes reducing the combustion of fossil fuel-fired generation, which will also reduce air pollution in communities near power plants, including disadvantaged communities.

BWP is also developing and implementing programs to target disadvantaged communities with energy efficiency and electrification programs that will lower natural gas consumption and improve local air quality. BWP is located along Interstate 5 and State Highway 134, which are sources of significant air pollutants. BWP promotes the use of transportation electrification as a strategy to reduce GHG emissions and helps customers overcome barriers to the adoption of electric vehicles. Customers living in disadvantaged communities can qualify for an increased rebate for an EV charging station and electric panel upgrade. BWP's priority for increased electrification and supporting the transition to electric vehicles is consistent with the requirement.

Net Energy Demand in Peak Hours

Senate Bill 338 (Skinner, Chapter 389, Statutes of 2017) requires POUs to consider existing a renewable generation portfolio, grid operation efficiency, energy storage, distributed energy resources, and energy reduction measures to reduce the need for new or additional gas-fired generation and distribution and transmission resources.[18] BWP's IRP discusses how renewable resources, grid equipment upgrades, energy storage (both in front of and behind the meter), and distributed energy resources, including energy efficiency and demand response, were considered for meeting energy and reliability needs during the net-peak hours. BWP's IRP is consistent with the requirement set forth above.

BWP recognizes the value and role of energy storage, distributed energy resources, and energy reduction play in helping meet its peak demand. BWP has modeled the potential system impact of energy storage resources in BWP's energy future to confirm the role it will play in its diversified resource portfolio.

Additional Procurement Goals

SB 350 (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 system reliability section above.

Energy Efficiency and Demand Response Resources

CEC staff finds that BWP's IRP is 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.

18 PUC Section 9621(c).

BWP manages a comprehensive portfolio of energy efficiency (EE) programs for home and business to assist with energy conservation and peak-shaving measures. These programs include a:

- Home improvement program.
- Refrigerator exchange program.
- Shade tree program.
- Air conditioning replace it before it breaks program.
- Residential and commercial rebate programs for the purchase and installation of high-efficiency retrofit measures.

These existing levels of energy efficiency (EE) measures were incorporated into the residential and commercial demand forecasts.

In measuring incremental EE savings, BWP used the incremental EE forecast from the CEC's 2022 Demand Forecast, AAEE Scenario 3 (mid set of assumptions) for BWP in its modeling scenarios and created the hourly energy efficiency forecast for the entire planning period. BWP estimated its AAEE will generate roughly 200 GWh of savings between 2026 and 2029. The *Revised SB 350 Doubling Energy Efficiency Savings by 2030* report targets a POU cumulative EE savings target of 169 GWh. BWP scaled down its EE estimates to meet this amount.

BWP did not offer any demand response (DR) programs while developing the planning scenarios of this IRP. However, BWP is aiming to expand DR offerings across its customer base such as a bring your own device (BYOD) program for residential and small commercial customers and the facilitation of an expanded demand-side grid services program for larger commercial customers. A BYOD program allows utility customers to enroll certain types of devices in a program and have the devices receive signals to reduce electricity usage during DR events. In return, customers earn a monetary incentive each year by participating in the program. The most common type of BYOD program is for customers with smart thermostats, allowing precooling. BWP started its BYOD smart thermostat program in September 2023. Summer 2024 will be the first year of full participation. Programs for larger commercial customers involve similar load management strategies including smart thermostats and other demand response measures.

Energy Storage

CEC staff finds that BWP's IRP is consistent with the requirement in PUC Section 9621(d)(1)(B) to address procurement of energy storage as it discussed the potential role of energy storage on its system. Assembly Bill 2514 (Skinner, Chapter 469, Statutes of 2010) also requires POUs to evaluate the potential of energy storage systems as a resource and establish procurement targets, if appropriate.

BWP recognizes the value and role of energy storage will have in meeting peak demand and ramping needs and integrating intermittent renewable generation. BWP has modeled the potential system impact of energy storage resources in BWP's energy future to confirm the

role it will play in its diversified resource portfolio, both as stand-alone storage and in hybrid solar plus energy storage systems as discussed in Chapter 1 of BWP's two preferred scenarios. BWP recognizes the potential future need for battery storage at decommissioned substations for the installations of energy storage facilities as strategic, cost-effective locations for connecting energy storage to BWP's subtransmission and distribution systems.

Transportation Electrification

CEC staff finds that BWP's IRP is consistent with the requirement of PUC Section 9621(d)(1)(C) as it addresses transportation electrification, projecting for light-duty electric vehicle growth. Electric vehicles are an essential to BWP's strategy of reducing GHG emissions and further accommodate integration of clean energy.

BWP promotes the adoption of transportation electrification through education and program development that helps customers overcome barriers to the adoption of electric vehicles. BWP is pursuing the installation of BWP-owned EV chargers in high-density residential areas and public parking lots. Burbank has 93 EV charging ports at 22 sites with plans to install an additional 116 ports by 2032. During the same period, BWP also anticipates providing rebates for the installation of another 779 privately owned charging ports.

BWP is also looking into providing technical assistance to help facilitate private workplace and fleet charging for interested businesses. In fiscal year 2023, BWP continued implementing a used EV rebate program, residential EV charger rebate program, and a commercial EV charger rebate program. Customers living in a disadvantaged community area can qualify for increased rebate amounts. BWP is at the forefront of fleet EV adoption as a fundamental component of its commitment to sustainability. Sixty percent of BWP's fleet cars are either all-electric, plug-hybrid, or hybrid; four hybrid bucket trucks are in service.

In terms of quantitative reporting, BWP's 2024 IRP includes an estimate of increased electrical load from EV charging for light duty plug-in EVs (Standard Tables — EBT), and increased peak from EV charging for light duty plug-in EVs (Standard Tables — CRAT).

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, electricity-related, and demand-response products. BWP's IRP and BWP's standardized tables demonstrated use of modeling and reliability analyses to balance a diverse resource portfolio including new resource procurement. The resource mix contains an array of zero-emission resources, including solar, wind, geothermal, zero-carbon thermal generation (using green hydrogen created through electrolysis powered by solar PV), battery storage, and small modular reactor. Resource development is spread throughout the planning period and includes both in-state and out-of-state resources, adding geographical diversity. Based on CEC staff's review, BWP's IRP meets this portfolio diversification requirement.

APPENDIX A: Abbreviations

Acronym	Term
AAEE	Additional achievable energy efficiency
AATE	Additional achievable transportation electrification
BWP	Burbank Water and Power
BYOD	Bring your own device
CARB	California Air Resources Board
CEC	California Energy Commission
CPUC	California Public Utilities Commission
DR	Demand Response
EE	Energy Efficiency
EV	Electric vehicle
GHG	Greenhouse gas
GWh	Gigawatt-hours
IEPR	*Integrated Energy Policy Report*
IPP	Intermountain Power Plant
IRP	Integrated resource plan
LADWP	Los Angeles Department of Water and Power
MMTCO2e	Million metric tons of carbon dioxide equivalent
MTCO2e	Metric tons of carbon dioxide equivalent
MW	Megawatt
MWh	Megawatt-hour
POU	Publicly owned utility
PPA	Power purchase agreement
PUC	Public Utilities Code
RPS	Renewables Portfolio Standard
SB 1020	Senate Bill 1020 (Laird, Chapter 361, Statutes of 2022)

SB 350	Senate Bill 350 (De León, Chapter 547, Statutes of 2015)
SMR	Small modular reactor
Tx	Transmission

APPENDIX B: Glossary

Term	Definition
Additional achievable energy efficiency (AAEE)	Energy efficiency savings not yet considered committed but deemed likely to occur, including impacts from future updates of building codes and appliance standards and utility efficiency programs expected to be implemented.
Additional Achievable Fuel Substitution	Energy demand from consumption changing from fossil fuels to electricity, such as building electrification, not yet considered committed but deemed likely to occur.
Additional achievable transportation electrification (AATE)	Energy demand from transportation electrification not yet considered committed but deemed likely to occur.
Behind-the-meter resources	Generation and storage located at the customer site. More generally, it can refer to any device located at the customer site that affects the consumption of grid-provided energy (appliance control systems, for example)
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.

Term	Definition
	• 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.
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 (CO2), methane (CH4),

Term	Definition
	nitrous oxide (N2O), halogenated fluorocarbons (HCFCs) , ozone (O3), perfluorinated carbons (PFCs), and hydrofluorocarbons (HFCs).
Integrated Energy Policy Report (IEPR)	Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the Energy Commission to prepare a biennial integrated energy report. The report contains an integrated assessment of major energy trends and issues facing California's electricity, natural gas, and transportation fuel sectors. The report 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.
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.
Plug-in electric vehicle (EV)	A vehicle that uses one or more electric motors for propulsion. Electric vehicles include battery-electric and plug-in hybrid vehicles.
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.
Renewable Portfolio Standard (RPS)	A regulation that requires a minimum procurement of energy from renewable resources, such as wind, solar, biomass, and geothermal.
Senate Bill 1020 (Laird, Chapter 361, Statutes of 2022) (SB 1020)	This bill revised state policy to require eligible renewable energy resources and zero-carbon resources supply 90 percent of all retail sales of electricity to California end-use customers by December 31, 2035, 95 percent of all retail sales of electricity to California end-use customers by December 31, 2040, 100 percent of all retail sales of electricity to California end-use customers by December 31, 2045, and

Term	Definition
	100 percent of electricity procured to serve all state agencies by December 31, 2035, as specified
Senate Bill 350 (De León, Chapter 547, Statutes of 2015) (SB 350)	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.