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STAFF PAPER

Review of Burbank Water and Power's 2019 Integrated Resource Plan

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ABSTRACT

Senate Bill 350 (De León, Chapter 547, Statutes of 2015), (Public Utilities Code Section 9621) 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. Burbank Water and Power submitted its *2019 Integrated Resource Plan* and supplemental information, which the Burbank City Council adopted on December 11, 2018, to the Energy Commission for review April 1, 2019. This staff paper presents the results of the Energy Commission staff review of the Burbank Water and Power integrated resource plan.

Keywords: Publicly owned utility, integrated resource plan, demand, resources, portfolio, generation, transmission, distribution, Renewables Portfolio Standard, forecast, energy efficiency, transportation electrification, demand response, greenhouse gas, GHG, emissions, system reliability, integration, local reliability, energy storage, distributed generation.

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EXECUTIVE SUMMARY

Public Utilities Code (PUC) Section 9621 requires publicly owned utilities meeting an electrical demand threshold to adopt an integrated resource plan (IRP) that meets certain requirements, targets, and goals, including greenhouse gas emission reduction targets and renewable energy procurement requirements. The California Energy Commission'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 various targets and planning goals from 2018 to 2030. The Energy Commission must review the IRPs to ensure consistency with the requirements of PUC Section 9621.

The Burbank Water and Power (Burbank) IRP filing reflects the dramatic changes the utility industry is undergoing including the need to address climate change, the growth of cost-effective renewable energy and energy storage, and the changing needs of a zero-carbon electricity grid. The utility's long-term strategy is to reduce its reliance on fossil resources, including coal and natural gas, while investing in clean resources such as solar, wind, and energy storage. Because Burbank serves mostly commercial and residential customers, with little industrial load, it experiences relatively sharp peak demands. Burbank plans to reduce its peak demand needs using energy efficiency, demand response, and time of use rates, which will improve reliability and lower costs. Burbank also plans to procure storage resources to manage increasing amounts of solar photovoltaic and other renewable resources.

Burbank is fully resourced until 2025 when it plans to exit its contract with the coal-fired Intermountain Power Project in Utah. The utility evaluated twelve resource portfolios, identifying three preferred portfolios to replace Intermountain Power Project with combinations of wind from Wyoming, solar photovoltaic from Utah, compressed air energy, and battery storage near Intermountain Power Project, along with the transmission resources needed to deliver renewable energy. All three preferred portfolios meet the 60 percent by 2030 renewable energy procurement requirement established by Senate Bill 100 (De León, Chapter 312, Statutes of 2018). In addition, the three preferred portfolios all achieve greenhouse gas reductions just below the low end of the California Air Resources Board greenhouse gas reduction target range.

In reviewing the Burbank IRP and determining consistency with the PUC Section 9621, Energy Commission 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's review of the IRP filing results in the following conclusions with respect to consistency with the requirements of PUC Section 9621:

- *Achieving Greenhouse Gas Emissions Targets and Renewables Portfolio Standard Requirements:* The values reported in the standardized tables, along with the narrative discussion in the IRP filing, demonstrate 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 values reported in standardized tables, along with the analysis and discussion in the IRP filing, demonstrate Burbank intends to meet planning goals related to retail rates, reliability, transmission and distribution systems, localized air pollution, and disadvantaged communities as set forth in PUC Section 9621(b)(3).
- *Considering Peak Needs:* The values reported in the standardized tables, along with analysis and narrative discussion, demonstrate Burbank has considered the role of existing renewable generation, grid operational efficiencies, energy storage, and distributed resources (including energy efficiency) in helping to 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 IRP filing includes values reported in the standardized tables and narrative discussion that demonstrate Burbank has 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).

In addition to IRP requirements, Senate Bill 350 (De León, Chapter 547, Statutes of 2015) requires the Energy Commission to establish statewide and utility specific targets to achieve a statewide doubling of energy efficiency by 2030. The IRP is consistent with this IRP requirement in that energy efficiency and demand response are addressed. Staff observes that aggressive energy efficiency and demand response programs are needed for utilities and energy efficiency providers to meet the 2030 energy efficiency doubling targets and capture the benefits of demand response. As part of the *2019 Integrated Energy Policy Report*, the Energy Commission will report on progress in achieving the doubling targets, including those for Burbank Water and Power, and update the targets if necessary.

CHAPTER 1: Background, Demand Forecast, and Procurement

Introduction

California Public Utilities Code (PUC) Section 9621 requires publicly owned utilities (POUs) with an annual electrical demand exceeding 700 gigawatt hours (GWh) to develop integrated resource plans (IRPs). IRPs are electricity system planning documents that describe how utilities plan to meet its energy and capacity resource needs while achieving policy goals and mandates, meeting physical and operational constraints; and fulfilling other priorities such as reducing effects on customer rates. PUC Section 9621 requires the governing board of a POU to adopt an IRP and a process for updating it at least once every five years by January 1, 2019.[1]

Further, PUC Section 9621 requires the POUs meeting the size threshold to submit an IRP and updates to the Energy Commission for review to determine consistency with the requirements of PUC Section 9621. If the Energy Commission determines an IRP is inconsistent with these requirements the Energy Commission shall provide recommendations to correct the deficiencies. The Energy Commission adopted the *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines* (*POU IRP Guidelines*) to govern the submission of the POU's IRPs.[2] PUC Section 9622 requires the Energy Commission to review POU IRPs to ensure they achieve PUC Section 9621 provisions (see **Attachment I**).

This chapter outlines the Energy Commission's review process and provides an overview of Burbank Water and Power (Burbank) 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.

Energy Commission IRP Review Process

On April 1, 2019, Burbank Water and Power (Burbank) submitted its IRP and supporting documentation to the Energy Commission for review. Staff's review includes two stages. First, staff performed a completeness review to ensure the IRP filing contained the POU board-adopted IRP, the four standardized tables, and supporting information needed for

1 Public Utilities Code Article 16 (commencing with Section 399.11) of Chapter 2.3 of Part 1 of Division 1. See Appendix A.

2 California Energy Commission. *2018 Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines*. Revised Second Edition. Publication Number CEC-200-2018-004-CMF. https://efiling.energy.ca.gov/GetDocument.aspx?tn=224889.

staff to conduct the review. Then staff conducted a detailed review to determine consistency with the requirements of PUC Section 9621.

Staff assessed and analyzed the data in the standardized tables and narrative provided, conducted informal discussions with Burbank staff, and verified data and information as needed. Staff considered the data supporting the assertions in the IRP in assessing whether the IRP is consistent with the requirements of PUC Section 9621.

Staff relied on internal subject matter experts to review technical Sections of the IRP filing including energy and peak demand forecasts; projections for renewable resource additions and whether they achieved Renewables Portfolio Standard (RPS) requirements; energy efficiency savings projections and programs; and plans for transportation electrification.

Overview of Burbank Water and Power

Burbank is a vertically integrated, city-owned, not-for-profit electric and water utility in Los Angeles County, as described below.

- Burbank delivers roughly 1.1 million megawatt-hours (MWh) of energy to over 45,000 residents and 6,800 businesses
- Residential customers constitute up to 87 percent of total customer meters; however, commercial customers consume nearly 75 percent of the total load
- Burbank has little heavy industrial customer load, and primarily serves residential and commercial loads
- Being vertically integrated means Burbank owns generation, transmission, and distribution assets that deliver energy to its customers
- According to the U.S. Census Bureau, in 2017, nearly 12 percent of people in Burbank were in poverty[3]
- Burbank has 335 megawatts (MW) of generation capacity that serves a forecasted (2019) peak demand of 307 MW
- By 2007, Burbank was the first utility nationwide to commit to 33 percent RPS by 2020; they exceeded 30 percent (31.9) by 2017
- Burbank expects to have negative, or no growth, in energy demand over the planning period.

The elected City Council of Burbank has ultimate decision-making authority for Burbank Water and Power, with input from the Burbank governing board.

[3] To see how the U.S. Census Bureau measures poverty, see: https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html

Burbank Water and Power's Planning Process

Although Burbank's board of directors is ultimately responsible for developing and adopting an IRP, public input plays an integral part. Burbank sought the perspectives of its customers on the utility's energy future in developing its IRP. In August 2018, Burbank conducted two town hall meetings and made available a customer survey on the IRP process. Over 1,200 customers responded to the survey, up from 100 in Burbank's 2015 IRP process. Some of the key issues discussed at the town hall meetings and in the survey include renewable energy, greenhouse gas (GHG) reductions, natural gas use for reliability and renewable integration, electrification efforts, and support for disadvantaged communities. Burbank staff developed the IRP with assistance from consultants.

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.[4] In addition, under the POU IRP Guidelines (Chapter 2.E.2), the POU must provide information on the method used in developing the demand forecast, if a POU uses a forecast other than the Energy Commission's adopted demand forecast.[5] Staff reviewed the demand forecast and supporting information provided in the IRP filing and determined that it presents an adequate estimation of future energy and peak demand that meets the *POU IRP Guidelines* requirements.

Energy and Peak Forecast, Methodology and Assumptions

Burbank uses the Energy Commission's demand forecast (*California Energy Demand 2018-2030 Revised Forecast*) to estimate its future net energy for load (or energy) and peak capacity needs, as it is close to its own long-term demand forecast.[6] Although the Energy Commission forecast for Burbank contains some impacts from customer-owned generation (rooftop solar, for example), Burbank adjusted the forecast to account for additional incremental customer-side energy resources, such as large customer rooftop solar, backup generation at hospitals, electric vehicle load, demand response, and energy efficiency.

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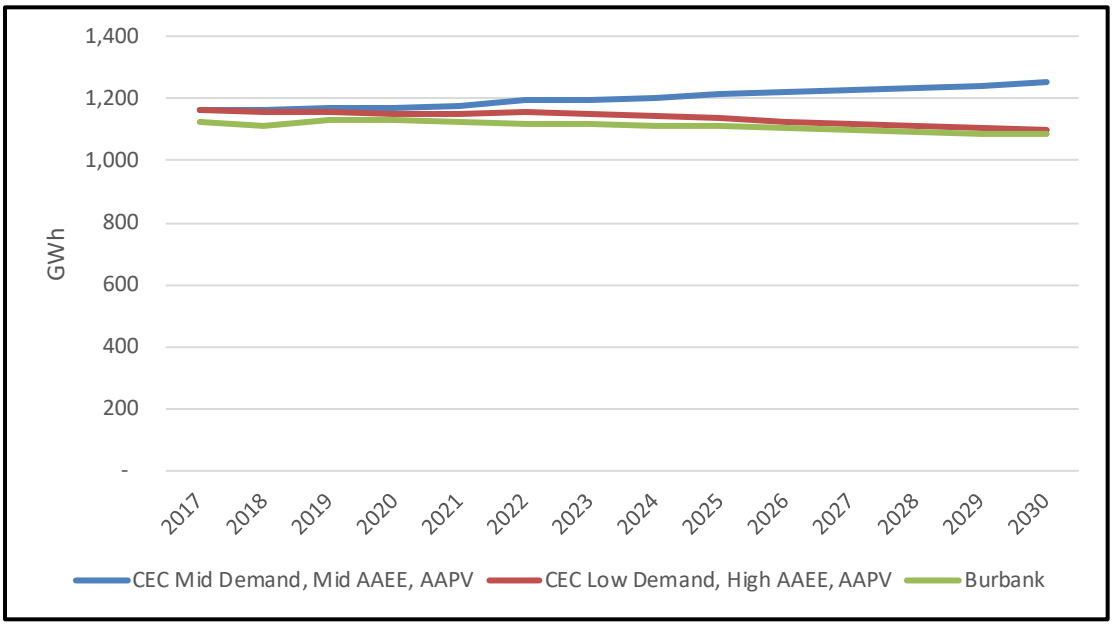
4 *POU IRP Guidelines*, Chapter 2, E., Pp 5-6

5 The most recently adopted demand forecast is for the *2018 Integrated Energy Policy Forecast Update*. https://www.energy.ca.gov/2018_energypolicy/documents/

6 For the purposes of IRP flings, a load-serving entity's net energy for load is the total amount of energy that it must generate or purchase to meet its retail load obligations. It includes retail consumption and transmission, distribution, storage and other losses, but excludes energy needed to meet wholesale sales obligations.

Figure 1: Burbank and Energy Commission Energy Forecasts 2018-2030 (GWh)

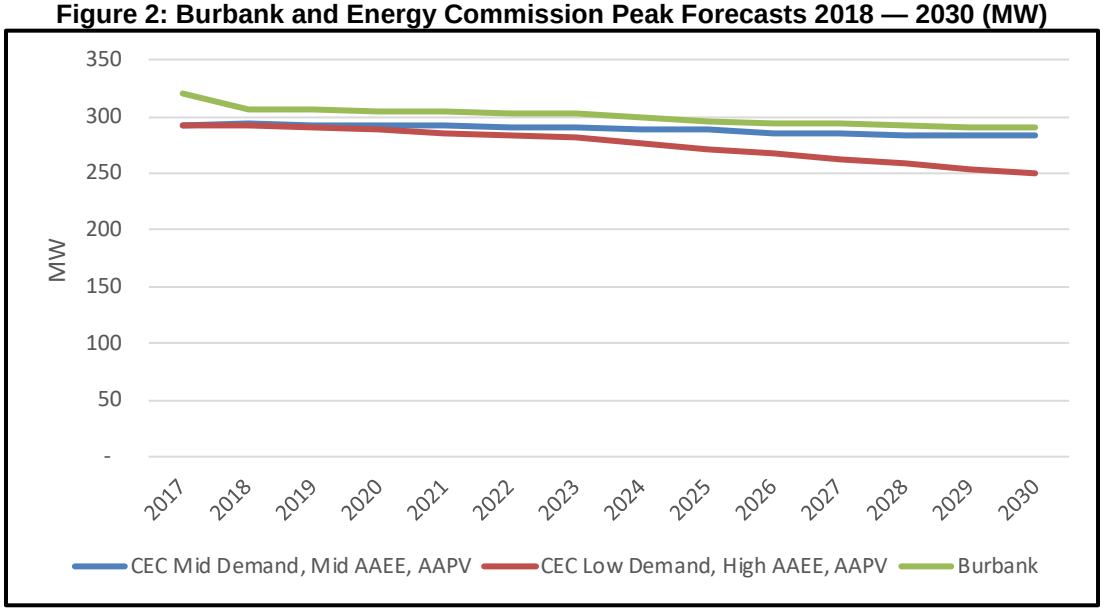


Source: California Energy Commission staff, Energy Assessments Division

Figure 1 compares Burbank's energy forecast with the Energy Commission's forecasts, showing that Burbank's energy forecast is lower than the Energy Commission's mid demand forecast and almost identical to the low demand forecast.[7] Burbank's energy forecast shows a slight decrease in demand, with an average annual growth rate of roughly -0.3 percent from 2019 to 2030, compared to an increase in demand, with a growth rate of roughly 0.6 percent in the Energy Commission's mid demand forecast. The difference between the Burbank and the Energy Commission mid demand forecast is 37 gigawatt-hour (GWh) in 2019, and grows to 164 GWh by 2030. The decrease in Burbank's forecasted energy demand likely comes from its efforts to reduce annual energy and peak capacity needs through energy efficiency, distributed generation, time of use rates, and demand response programs. This also may explain why Burbank's forecast is closer to the Energy Commission low demand forecast, which reflects higher levels of demand reduction.

7 The Energy Commission develops three demand forecasts as part of its Integrated Energy Policy Report: the Mid Demand, Mid AAEE Mid AAPV" (mid demand), the "Low Demand, High AAEE High AAPV" (low demand), and the "high demand, low AAEE low AAPV" (high demand) forecast. AAEE refers additional achievable energy efficiency and AAPV refers to additional achievable Photovoltaics.

Figure 2: Burbank and Energy Commission Peak Forecasts 2018 — 2030 (MW)



Source: California Energy Commission staff, Energy Assessments Division

Burbank's peak forecast is higher than the Energy Commission's mid and low demand peak forecasts as shown in **Figure 2**. The peak forecasts show small annual average decreases, -0.46 percent for Burbank and -0.25 percent for the Energy Commission mid demand forecast. Burbank's peak forecast is higher than the Energy Commission's peak forecast in each year of the planning period. In 2019, the difference is 14 megawatt (MW) (5 percent), and by 2030, this difference decreases to 6 MW or (2 percent).

Resource Procurement Plan

The Energy Commission's *POU IRP Guidelines* require that a POU report the mix of resources they plan to use to meet demand from 2018 to 2030.[8] The guidelines also require a POUs to provide an IRP with data and supporting information sufficient to demonstrate that the POU is meeting the various targets and goals. Based on staff's review, Burbank's IRP filing meets these guideline requirements. The following discusses Burbank's existing resources, its procurement strategy, the portfolio analysis underlying resource selections, and the resources in 2030 identified in the standardized tables.

Existing Resources

Currently, Burbank has a diverse portfolio of resources including coal, nuclear, natural gas, large hydroelectric, and renewables. In the 1930s, Burbank entered into a contract with the Western Area Power Administration to purchase hydroelectric energy and capacity from Hoover Dam, which it plans to continue through 2067. In the late 1950s, and early 1960s, Burbank increased its local natural gas generation through the construction of the Olive Unit 1 and 2 steam turbines that provide capacity and

8 *POU IRP Guidelines*, Chapter 2.F., P. 6.

reliability benefits to the utility. In the 1980s, Burbank acquired a share of the Intermountain Power Project (IPP) coal facility, which is still operating. The Lake One natural gas peaker plant was installed in the early 2000s.[9] The utility plans to operate the Lake 1 gas turbine through 2030 and beyond, and exit its contract with IPP by 2027. The Magnolia combined cycle natural gas plant came on-line in 2005 and is expected to operate through 2030 and beyond. Under Burbank's contract with the Palo Verde nuclear plant, the utility expects to receive power from the facility through 2047. Burbank worked with Southern California Public Power Authority and other entities for joint participation in several of these projects including IPP, Palo Verde, Magnolia, and Hoover.

In 2017, Burbank reached an RPS of 33 percent, procuring most of its renewable resources under contracts rather than ownership. Burbank's current renewable portfolio includes several small facilities such as the Chiquita Hills landfill gas facility, the Copper Mountain solar facility, the Don Campbell 1 and Wild Rose geothermal plants, and the Pleasant Valley, Milford 1, and Pebble Springs wind resources. Burbank's existing renewable resources are described in more detail in the Section on Renewables Portfolio Standard Planning Requirements on pages 13 to 15.

Burbank currently has baseload, intermittent, peaking, and flexible fast ramping resources in its portfolio. The utility plans to procure primarily renewable resources, and only procure additional natural gas resources if needed to maintain reliability, integrate intermittent renewables, and address over-generation and evening ramping needs caused by increasing amounts of solar PV resources.[10]

Resource Portfolio Evaluation

Burbank is currently fully resourced and will not need to procure additional resources to meet load until 2025 when it exits its IPP contract. Burbank developed twelve resource portfolios for replacing IPP that it evaluated for cost, reliability, and risk. The initial twelve portfolios included a combined cycle natural gas plant at the IPP site, wind in Wyoming, solar PV in Utah, battery and compressed air energy storage, and natural gas powered internal combustion engines. Burbank eliminated six of the portfolios that included the natural gas combined cycle resource as it found these portfolios were not cost-effective and resulted in GHG emissions that exceeded its GHG emission reduction target.

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[9] Natural gas peaker plants, or just peaker, are power plants that generally only run when there is a high demand, and only run for a few hours a year.

10 Large amounts of solar generation cause two operational issues. First, high levels of solar generation during the middle of the day may result in total electric generation exceeding demand ("over-generation") and requiring the curtailment of solar generators. Second, as the sun rises in the morning and sets in the late afternoon and early evening, solar output will change must faster than demand, requiring large amounts of non-solar generation capacity to ramp up (in the evening) and down (in the morning) quickly to keep output and demand in balance.

Through additional modeling and analysis, Burbank selected three preferred resource portfolios that would allow for replacing power from IPP, integrating additional renewable energy (exceeding a 60 percent RPS by 2030), and mitigating solar ramping needs. Because it is not cost-effective to contract with IPP when it converts to a combined cycle natural gas plant, Burbank excluded this option from further consideration. Each of the preferred scenarios includes the same set of existing resources, and similar types of new renewable and energy storage resources

- Portfolio A includes 46 MW of Wyoming wind, 44 MW of Utah solar, and 54 MW compressed air, and 27 MW of battery energy storage
- Portfolio B includes 46 MW Wyoming wind, 44 MW of Utah solar, and 113 MW of battery energy storage
- Portfolio C includes 46 MW of Wyoming wind, 44 MW Utah solar, 50 MW of battery energy storage, and 54 MW of efficient internal combustion engines

Burbank's analysis found the three preferred resource portfolios to be the most cost effective when considering how weather variations can affect market prices, and all three preferred portfolios provide for reliability and low, stable rates. The three preferred portfolios also had the least amount of risk compared to the other portfolios.

Burbank estimated the total resource costs of each portfolio, including market risk, over their planning period (2019-2038).[11] The costs are measured in net present value, in 2025 dollars. Although Portfolio A had the lowest total cost, all three preferred portfolios had similar costs:

- Portfolio A: $898 million
- Portfolio B: $906 million
- Portfolio C: $919 million

Because the three preferred portfolios have similarly low costs, Burbank has flexibility in negotiations with POUs and other parties to fund joint projects where participants can share the large investments necessary to achieve economies of scale, while maintaining low rates.

Procurement Strategy

Burbank's long-term planning strategy includes procuring enough renewable resources to reach at least a 60 percent RPS by 2030 and meet the SB 100 goal of 100 percent renewable and zero-carbon energy by 2045. Burbank plans to procure additional energy storage and demand response resources to mitigate solar over-generation and ramping needs. As most of Burbank's load is from residential and commercial customers, its load

11 Burbank defined total resource costs to include: energy efficiency and demand response program costs, costs of capital investments in power plants, fuel, operation, and maintenance costs of supply resources, power purchase agreement costs to meet RPS requirements, transmission costs for existing and new resources, GHG emission costs, and costs of market energy purchases.

factor is around 40 percent, meaning Burbank's electric system has relatively sharp peak demands.[12] Burbank plans to focus on energy efficiency and demand response, including residential time of use rates, to reduce its peak capacity and energy needs, and manage peak demand and evening ramps.

Although Burbank did not choose a single preferred portfolio, staff reviewed the standardized tables from Portfolio A, which was the most cost-effective of the preferred portfolios and includes the following strategies:

- Meet a minimum RPS level of 60 percent by 2030 and mitigate the impact from solar over-generation and morning and evening ramping.
- Implement residential time of use rates to incentivize customers to shift their electricity use to times when renewable supply is more abundant.
- Work with Los Angeles Department of Water and Power (LADWP) and others to maintain Burbank's share in the Southern Transmission System (STS) once it exits the IPP contract.[13]
- Identify options and costs for transmission delivery of large amounts of renewable energy resulting from SB 100.

As outlined in the standardized tables, Burbank plans to meet future energy and peak demand through a mix of utility-owned generation (including Palo Verde and fossil resources), existing long-term contracts for renewable resources, new contracts for renewable resources and, energy storage, as well as wholesale energy purchases. Burbank plans to update the IRP within the next five years as it evaluates new resource needs to meet energy and peak demand and achieve RPS procurement requirements and GHG emission reduction targets. **Table 1** summarizes the energy resources in the utility's selected portfolio in 2019, 2025, and 2030. Burbank plans to add 173 GWh of solar and 329 GWh of wind between 2019 and 2030. The utility forecasts energy from small hydroelectric, biomass, and geothermal will remain relatively constant over the planning period. In 2026, Burbank plans to procure a compressed air energy storage resource that will help integrate variable renewable resources. **Appendix B** includes a table identifying energy resources by type for 2019 through 2030, see **Table B-1**.

Energy from natural gas resources decreases by roughly 20 percent between 2019 and 2030. Burbank will eliminate coal resources by fully divesting from IPP, reducing the contribution of coal in Burbank's portfolio from 40 percent in 2019 to zero by 2025. Burbank projects a 15 percent increase in spot-market purchases and sales between 2019 and 2030. Energy from the Hoover large hydro and nuclear from Palo Verde are projected to remain relatively flat over the planning period. Burbank's increasing

12 The average system load factor is the average load compared with the annual peak load. The lower the load factor, the sharper the peak demand.

13 The Southern Transmission System consists of a high voltage direct current transmission line from the IPP site near Delta, Utah, to Adelanto in Southern California that currently deliver the output from IPP. Burbank is in discussions with LADWP and others to ensure continued access to this transmission to deliver replacement resources for IPP including out-of-state renewables.

renewable procurement results in a capacity surplus throughout the planning period, which ranges from 24 MW in 2019 to 91 MW in 2030. The increase in spot-market sales may reflect economic sales of these surplus resources.

Table 2 summarize the capacity resources relied on to meet peak demand and reliability requirements in 2019, 2025, and 2030. The capacity resources Burbank procures shows similar trends for its energy resources, with increases in renewables and decreases in fossil resources. Burbank plans to procure 14 MW of battery storage in 2025 and an additional 27 MW of energy storage in 2030. **Appendix B** includes a table identifying capacity resources by type for 2019 through 2030, see **Table B-2**.

Table 1: Energy Resources by Type 2019, 2025, and 2030 (MWh)

		2019	2025	2030
Total Net Energy for Load		**1,131,017**	**1,110,388**	**1,087,672**
Non-RPS	Coal	455,493	180,137	0
	Large Hydroelectric	20,934	20,928	22,011
	Natural Gas	586,010	507,264	466,448
	Nuclear	85,848	85,848	85,848
	Storage (compressed air)	0	0	106,349
	Spot Purchases	260,337	246,911	299,887
	Spot Sales	(431,824)	(640,399)	(493,448)
RPS Resources	Biofuels	4,818	4,666	4,756
	Geothermal	26,230	26,255	26,256
	Small hydroelectric	28,845	28,845	28,845
	Solar PV	91,137	268,476	263,822
	Wind	75,865	464,616	404,410
	Undelivered RPS energy	(72,677)	(83,160)	(127,513)
Total Energy Procured		1,131,017	1,110,388	1,087,672
Surplus/(Shortfall)		**0**	**0**	**0**

Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP filing

Table 2: Capacity Resources by Type for 2019, 2025, and 2030 (MW)

		2019	2025	2030
Peak Demand		308	310	310
Planning Reserve Margin		28	24	26
Peak Procurement Requirement		335	320	316
Non-RPS	Coal	74	0	0
	Large Hydroelectric	20	20	20
	Natural Gas	226	261	226
	Nuclear	10	10	10
	Storage (compressed air)	0	27	54
	Storage (Battery)	0	14	27
	Biofuels	1	1	1
RPS Resources	Geothermal	2	2	2
	Small hydroelectric	6	6	6
	Solar PV	12	31	31
	Wind	8	36	30
Total Capacity Procured		359	410	407
Surplus/(Shortfall)		24	90	91

Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP filing

CHAPTER 2:
Review for Consistency with Public Utility Code Section 9621 Requirements

This chapter summarizes the main elements of Burbank's 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 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 Energy Commission and California Public Utilities Commission.[14] These GHG targets reflect the electricity sector's percentage in achieving the economy-wide GHG emission reductions of 40 percent from 1990 levels by 2030. Energy Commission staff reviewed the GHG emissions associated with Burbank'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 Burbank's portfolio to ensure consistency with other data available to staff.

Staff finds that Burbank plans to achieve the GHG emission target range established by CARB of 129 and 228 thousand metric tons of carbon dioxide equivalent (MT CO_2e). Burbank's resource portfolio results in roughly 73 MT CO_2e, which more than 50 MT below the low end of the range, and is consistent with the requirement of PUC Section 9621(b)(1). To achieve emissions reductions to this amount, Burbank reduces output from its natural gas resources by 20 percent (from 2019 to 2030) and procures 76 percent of its resources from renewables by 2030. To estimate portfolio emissions, Burbank multiplied a specific plant or spot market emission intensity by the total generation from each plant and the amount of spot-market purchases.

Table 3 shows GHG emissions for Burbank's portfolio of resources in 2019, 2025, and 2030. The largest single source of GHG emissions reductions comes from Burbank's elimination of coal resources. **Appendix B** includes **Table B-3** that identifies the emission intensities and total emissions for individual resources for all years.

14 Public Utilities Code Section 9621(b)(1).

Table 3: Greenhouse Gas Emissions from Burbank's Resources Portfolio

	Fuel Type	GHG Intensity (mt CO_2e/MWh)	Total Emissions (MT CO_2e)		
			2019	2025	2030
Lake 1 CT	natural gas	0.550	8	12	7
Olive 1 ST	natural gas	0.650	0	0	0
Olive 2 ST	natural gas	0.650	0	0	0
Magnolia CC	coal	0.40	225	192	179
Intermountain	coal	0.930	421	167	0
Storage (compressed air)	storage	0.230	0	0	25
Spot market purchases	system	0.428	111	106	128
Portfolio emissions	portfolio	NA	767	476	339
Emissions adjustments					
Undelivered RPS energy (MWh)	NA		72,677	83,160	127,513
Emissions adjustment from undelivered RPS energy	NA	0.428	(31)	(36)	(55)
Emissions adjustment due to spot market sales	system	0.428	(185)	(274)	(211)
Adjusted Portfolio emissions	**portfolio**	**NA**	**551**	**167**	**73**

Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP filing (CT means combustion turbine, ST means stream turbine, and CC means combined cycle)

Renewables Portfolio Standard Planning Requirements

PUC Section 9621(b)(2) requires that POU IRPs ensure procurement of at least 50 percent renewable energy resources under the Renewables Portfolio Standard (RPS) by 2030 consistent with Article 16 (commencing with Section 399.11) of Chapter 2.3.[15] Staff reviewed the renewable procurement standardized reporting table, the discussion in the IRP filing, and the renewable procurement plan submitted. Staff finds that Burbank's plans are consistent with the RPS procurement requirements in 2030 and all interim compliance periods and are consistent with requirements of PUC Section 9621(b)(2).

Burbank plans to exceed the current RPS requirements of PUC Section 9621(b)(2) and SB 100 requirements by acquiring RPS-eligible resources to meet 76 percent of retail sales by 2030. Meeting this RPS target requires that Burbank procure an annual average of 46 GWh of renewable energy from 2019 to 2030. Burbank's resource portfolio meets the 2030, as well as the interim, renewable energy procurement requirements.

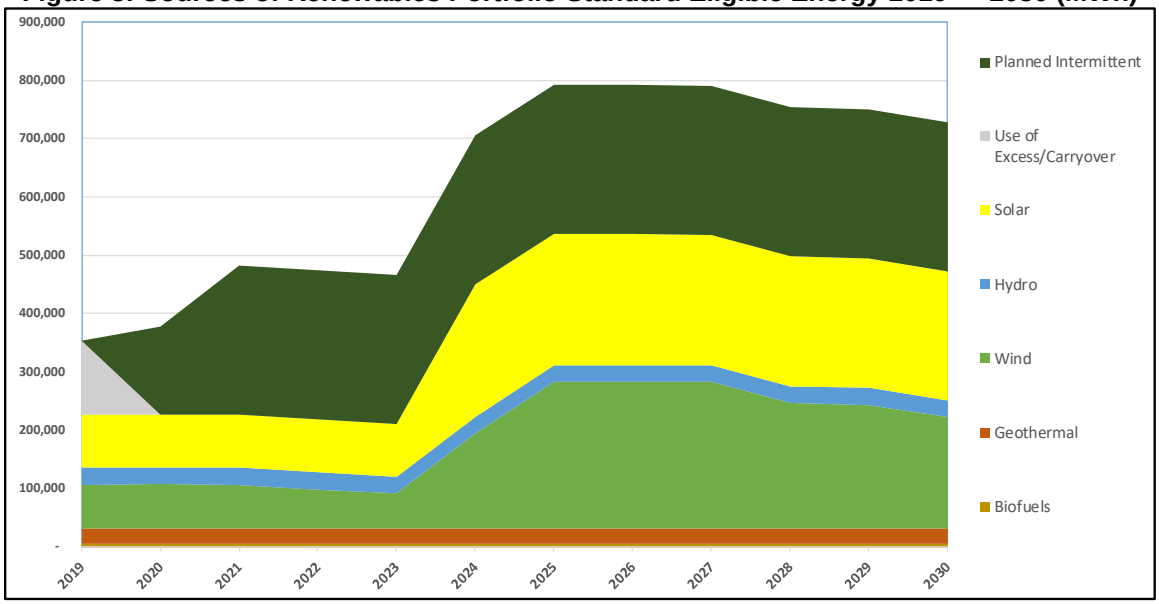
15 PUC Section 9621(b) requires the governing board of POUs to adopt an IRP on or before January 1, 2019, while PUC Section 9621(b)(3) requires the IRP ensure procurement of at least 50 percent eligible renewable resources by 2030. SB 100 (de León, Chapter 312, Statutes of 2018) increases the RPS requirement for 2030 from 50 to 60 percent. However, since the POUs were required to adopt their IRPs before SB 100 went into effect, the POU was only required to plan for the 50 percent RPS target in their IRP. Future POU IRPs will need to meet RPS requirements in effect when these updates are filed.

The utility expects to use its energy storage resources to help integrate increased amounts of renewable resources and address over-generation and ramping needs from solar. **Figure 3** and **Figure 4** show the increase in renewable generation from 2019 to 2030. Burbank expects to reach the following RPS levels over the planning period:

- 38 percent of retail sales by 2020
- 71 percent of retail sales by 2024
- 81 percent of retail sales by 2027
- 76 percent of retail sales by 2030

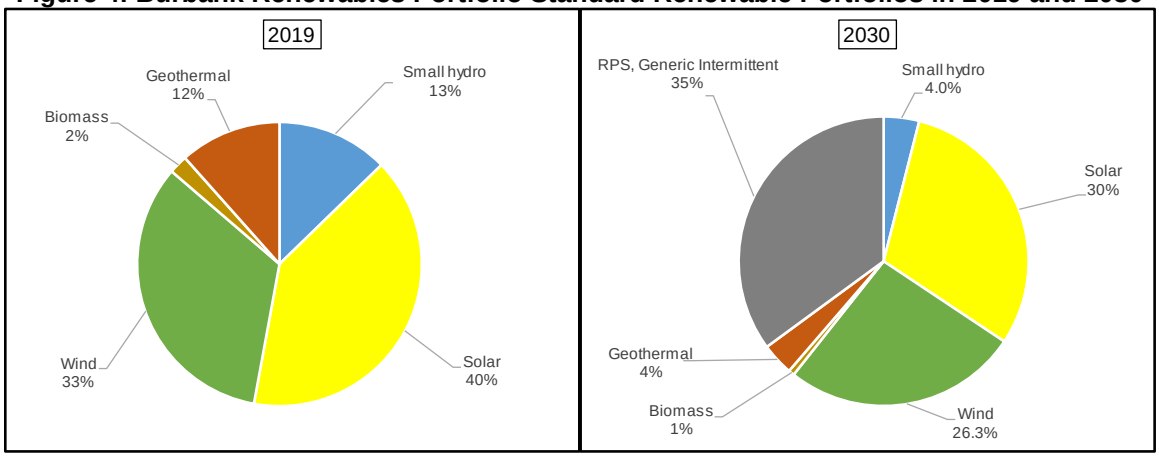
Burbank has a number of existing renewable resources it uses to meet both load and RPS requirements. Burbank contracts for eight MW of wind resources in Wyoming and Oregon. The Milford wind contract is expected to remain through 2030, while the utility plans to exit the wind contract with Pleasant Valley by 2023 and Pebble Springs wind plant by 2027. The utility contracts for 12 MW of Solar PV from the Copper Mountain solar facility in Boulder City, Nevada, and expects this contract will provide capacity and energy through 2030. Burbank also contracts for eight MW from the Tieton small hydroelectric facility in Washington, and expects the contract to remain through the planning period. Burbank also has a contract for two MW from the Don Campbell (Wild Rose) geothermal plant in Nevada, and expects to receive energy and capacity from this resource through 2030.

Figure 3: Sources of Renewables Portfolio Standard Eligible Energy 2019 — 2030 (MWh)



Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP filing

Figure 4: Burbank Renewables Portfolio Standard Renewable Portfolios in 2019 and 2030



Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP filing

Burbank expects to meet its additional RPS requirements primarily with solar and wind resources, while maintaining other existing biomass, wind, solar, and geothermal resources from its portfolio including:

- One landfill gas facility, Chiquita Canyon that supplies nearly 1 percent of total renewable energy supply.
- Three solar PV facilities (Copper Mountain, IPP solar, and a generic solar facility) that together supply 36 percent of total renewable energy supply.
- Two wind facilities (Wyoming wind, and a generic wind facility) that together supply 55 percent of total renewable energy supply.
- One geothermal facility (Don Campbell 1 also known as Wild Rose) that supplies 4 percent of total renewable energy supply.
- One small hydroelectric facility (Tieton Hydropower) that supplies 4 percent of total renewable energy supply.

Along with generation resources, Burbank purchases portfolio content category (PCC)[16] 1, PCC 2, and PCC 3 resources in compliance period 3 (2017-2020), to meet RPS procurement requirements. From 2020 to 2030, the utility stops purchasing PCC resources, and instead relies on its existing and planned generation resources. By 2027, Burbank exits two of its wind resource contracts, making up the difference with spot-market purchases; this explains why Burbank's RPS percentage drops slightly between 2027 and 2030.

16 The RPS defines three categories of RPS procurement. Category 1 is renewable energy produced in or transmitted directly to California. Category 2 is renewable energy that is produced out-of-state and purchased by a California load-serving entity, but provided to an out-out-state utility in exchange for an often smoother stream of electricity ("firmed and shaped") from unspecified generation sources. Category 3 is renewable energy credits that are purchased without the underlying renewable energy ("unbundled RECs"). At least 75 percent of a utility's RPS procurement must be in Category 1, no more than 10 percent can be in Category 3.

Retail Rates

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 and minimize impacts in ratepayer bills. Staff reviewed the analysis and information Burbank presented on the rate and bill impacts from resource portfolios it evaluated. Staff finds the IRP is consistent with PUC Section 9621(b)(3).

Burbank offers a number of rate schedules depending on customer type, including reduced rates for low-income customers, time of use rates, and EV charging rates. Burbank has some of the lowest rates among other POUs and IOUs in southern California. It has maintained rate increases below the long-run rate of inflation, and plans to continue this practice.

When setting rates, Burbank uses a cost of service study to ensure all customers are paying their fair share of operating and maintaining the electric utility. In 2007, Burbank started to implement time of use rates for its commercial customers to reflect the true cost of delivering electricity, which vary depending on the time of day, season, and observation of holidays. In 2020, Burbank plans to make time of use rates available to residential customers.

To reduce price risks and volatility, Burbank developed both short- and long-term energy procurement strategies, as well as an energy risk management policy, which are regularly updated. Under these policies, Burbank's risk oversight committee meets to discuss power supply risk, market conditions, and transactions needed to maintain reliable and affordable customer rates.

System and Local Reliability

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) requires filing POUs to adopt an IRP that ensures system and local reliability and addresses resource adequacy requirements.[17] Energy Commission staff reviewed Burbank's capacity reporting table and discussion and finds that Burbank has planned for sufficient resources to maintain a reliable electric system. Burbank'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 reliability requirements in PUC Section 9621(b)(3) and resource adequacy requirements in PUC Section 9621(d)(1)(E).

System Reliability and Resource Adequacy

Burbank is a distribution utility that is a member of the LADWP balancing authority (BA), which is responsible for continuously balancing supply and demand for electricity within its area and between other balancing authorities. BAs must also meet technical and operating standards established by the Western Electricity Coordinating Council to

17 Public Utilities Code section 9621(b)(3).

ensure reliability.[18] Even though Burbank is a member of LADWP's BA, it still must provide for its own reserve requirements to cover unforeseen events, including a share of generating facilities and transmission lines. Historically, Burbank has met this reserve requirement using its local generating facilities. However, starting in 2015, under a renegotiated service agreement, Burbank has the opportunity to purchase its reserve obligations from LADWP instead of using its own resources. Burbank's reserve obligation includes 40 MW of spinning reserve and 40 MW of supplemental capacity for 80 MWs of reserve capacity.

Although the LADWP is responsible for reliability on the bulk transmission system (above 69 kV), Burbank is studying the need for transmission developments to access and deliver large amounts of new renewable resources. A discussion of potential transmission needs is described in the next section on pages 18 to 19.

California utilities in the state are generally required to plan for a 15 percent reserve margin, which requires they procure enough excess capacity to exceed a one-in-two system peak demand by at least 15 percent.[19] Burbank's three preferred portfolios provide a range of planning reserve margins of 8 to 11 percent in Portfolio A to 22 to 27 percent in Portfolio B, with Portfolio C at 12 to 16 percent. Portfolio A has a lower planning reserve margin compared to Portfolios B and C, as portfolio A includes compressed air energy storage, which can store energy for up to 48 hours. This technology is expected to provide more reliability than 4-hour battery storage in Portfolio B and internal combustion engines in Portfolio C. Thus, a lower planning reserve margin is required in Portfolio A to maintain the same level of reliability.

Burbank expects system peak demand need, including the planning reserve margin, to decrease from 335 MW in 2019 to 316 MW by 2030, a 5 percent decrease. A growing surplus of capacity is expected over the planning period with a 24 MW surplus in 2019 growing to 91 MW in 2030; the surplus grows from 8 percent of peak in 2019 to 30 percent of peak in 2030. While the bulk of new planned capacity will come from solar PV, wind, and battery energy storage, Burbank plans to maintain its existing natural gas resources to ensure system reliability.

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18 WECC establishes reserve criteria to ensure reliability in the event of contingencies such as equipment failures and natural disasters in accordance with North American Electric Reliability Corporation reliability standards, which is overseen by the Federal Energy Regulatory Commission.

19 One-in-two system peak demand is the peak demand that can be expected to occur 50 percent of the time and reflects normal or average weather conditions.

The planning reserve margin, measured as a percentage, is the ratio of excess capacity (maximum available capacity less the highest expected peak demand) to peak demand. A 15 percent reserve margin means that an electric system has excess capacity in the amount of 15 percent of expected peak demand. It is used to maintain the reliable operation of the utility's electric system while meeting unforeseen increases in demand, and unexpected outages of generation or transmission.

Local and Flexible Capacity Needs

The LADWP does not specify requirements for local or flexible capacity needs for Burbank. LADWP treats Burbank effectively as a sub-balancing authority that must balance its own loads against supply under its service agreement with LADWP. Burbank currently has enough capacity from its local natural gas resources to meet its local capacity needs, and the utility plans to purchase additional capacity resources from LADWP when needed. Although Burbank did not identify a specific local capacity need, it is procuring battery and compressed air energy storage resources to address potential future local capacity needs.

After 2025, Burbank starts increasing its procurement of renewable resources, which may require additional flexible capacity to address ramping and intra-hour renewable intermittency. Burbank's Lake 1 and Magnolia Power Project are expected to be on line through the planning period to provide flexible capacity. Burbank plans to procure energy storage resources (potentially at the IPP site) to meet additional flexible capacity needs.[20] Burbank is also evaluating further improvements in the operational flexibility of Magnolia Power Project to integrate renewables and ensure reliability.

Transmission and Distribution Systems

PUC Section 9621(b)(3) also requires filing POUs to adopt an IRP that ensures that the POU achieves the goal of strengthening the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities. Energy Commission staff reviewed data and information presented in Burbank's IRP filing to ensure it adequately plans to maintain and enhance its transmission and distribution systems. Staff finds Burbank has planned for enough transmission to deliver resources to its service area to meet the requirement as discussed below. Staff also finds that Burbank conducts adequate planning to address the adequacy of its distribution system. As such, staff finds the IRP is consistent with the transmission and distribution requirements set forth above.

Transmission System

Burbank contracts with Southern California Public Power Authority, LADWP, and others for transmission resources to import power into its service territory. Some of the delivered energy comes from LADWP, and some comes from outside of California. LADWP operates Burbank's transmission system, so it is responsible for ensuring bulk transmission system reliability. Some of Burbank's transmission resources include:

- A 115 MW share of the Pacific Northwest 500 kV DC Intertie Transmission System that brings power from northern Oregon to Sylmar, California. Burbank

20 Although Burbank did not specify an amount of flexible capacity need, it plans to procure 27 MW of 4-hour battery storage to address this need.

uses this system to import Pacific Northwest renewables and purchase and sell spot market energy to and from Burbank.

- A 108 MW share (4.5 percent) in the Southern Transmission System 500 kV DC transmission system that delivers power from IPP in central Utah to the Adelanto switching station near Victorville, California. Burbank uses this system to bring power from IPP and its Milford wind plant to the LA basin.
- A 38 MW share of the Northern Transmission System that consists of two, 50-mile-long, 345 kV AC transmission lines that bring power from IPP in Utah to the Mona substation in Utah, and to the Gonder substation in Nevada. Burbank primarily uses these lines for wholesale trading and buying short-term market power.
- A 25 MW share of the Mucullough-Victorville Line 2 that consists of a 500 kV AC transmission line that brings power from the Mucullough transmission hub near Las Vegas to Victorville, California. Burbank uses this transmission line to make power transactions with Nevada, New Mexico, and Arizona.
- A 20 MW firm capacity right using LADWPs transmission system to bring hydroelectric power from Hoover to Burbank.
- An 84 MW firm transmission capacity right at the 500 kV bus of the Adelanto Switching station. This agreement allows Burbank to import power from IPP, as well as transactions with other utilities in Utah and Nevada.

To enable delivery of new renewable resources to its service territory, Burbank plans to upgrade its existing transmission system and procure new transmission resources. Burbank also plans to ensure it has continued access to the Southern Transmission System after exiting the IPP contract to deliver out-of-state renewables. One of the action items identified in the Burbank's IRP is the analysis and selection of transmission options and costs for delivery of renewables to meet SB 100.

Distribution System

Burbank's distribution system covers 17 square miles and includes 69, 34.5, 12, and 4 kV lines that distribute energy to residential and commercial customers. A large portion of Burbank's distribution system was built in the 1940s and used 4 kV lines. To increase reliability and reduce power loss, Burbank has already upgraded and will continue updating the distribution system to 12 kV lines. Burbank is also planning for increased amounts of customer-owned distributed energy resources and is monitoring distribution system voltages and circuit loading using its advanced metering infrastructure.

In 2015, Burbank developed a 20-year Distribution Master Plan. This plan provides a long-term strategy for maintaining and improving the safety, reliability, and operational efficiency of the distribution system, and implementing grid modernizations. Using the plan as a guide, Burbank has updated and modernized its distribution system and is looking forward to address increased use of distributed energy resources. These

upgrades are discussed in more detail below. Burbank's plans are consistent with the requirement of PUC Section 9621(b)(3).

As part of its Distribution Master Plan, Burbank established a 20-year capital improvement plan to address reliability on the distribution system. The following recent and planned projects include:

- Construction of a new 67 MVA, 12 kV electrical substation, the Ontario Substation, to provide additional 12 kV capacity to convert and retire two of its oldest 4 kV electrical substations, the Victory and Winona Substations.
- Installation of microprocessor relays on all of its distribution feeders along with a robust Wi-Fi mesh network throughout its electrical distribution system to address challenging protective relaying issues presented by larger penetrations of distributed resources in the future.
- Use of advanced metering infrastructure by implementing three systems to transmit and maintain meter read data including:
    - Digital water and electric meters.
    - Water and electric wireless meter reading systems with two-way secure mesh radio communication.
    - Meter Data Management System to store and manage meter data.

Burbank performed an assessment of the existing software applications for system operators in its Energy Control Center including Supervisory Control and Data Acquisition, Automatic Generation Control, load forecasting, and an Outage Management System. To meet its current needs and adapt to future requirements, Burbank is considering upgrading its systems to an Advanced Distribution Management System (ADMS). Burbank plans to update is Distribution Master Plan regularly.

Disadvantaged Communities and Localized Air Pollutants

PUC Section 9621(b)(3) requires POUs to minimize localized air pollutants and GHG emissions with early priority on disadvantaged communities. Energy Commission staff reviewed information presented in Burbank's IRP filing to determine the extent to which they are minimizing local air pollutants with a priority placed on disadvantaged communities. Staff finds that Burbank has made efforts to address these issues in selecting the resources they plan to include in its portfolio consistent with the requirement.

Burbank used the California Environmental Protection Agency's (CalEPA) California Communities Environmental Health Screening Tool (CalEnviroScreen) to identify disadvantaged communities in its service area. Most of the disadvantaged communities in Burbank's service territory are along Interstate 5 and Highway 134, which are sources of significant air emissions from gasoline and diesel fueled vehicles. The Lake 1, Magnolia, and Olive 1 and 2 natural gas power plants, owned by Burbank, emit air

emissions near disadvantaged communities. These natural gas plants came online in the early 2000s to replace older, less efficient plants that emitted significantly more air pollution near disadvantaged communities.

Burbank offers programs for residents and businesses in disadvantaged and low-income communities including:

- Installation of 16 electric vehicle chargers at the Burbank Town Center, an area identified as a Disadvantaged Community, partly due to its proximity to Interstate 5. This program will incentivize the purchase of electric vehicles for nearby residents and improve air quality in the area.
- During fiscal year 2016-2017, Burbank expanded the Home Improvement Program to customers served by the McCambridge distribution feeder, which includes thousands of homes in disadvantaged communities. Through this targeted program, Burbank saw a reduction in peak demand of between 1 and 2 percent. More importantly, Burbank residents in this area have been able to realize increased comfort in their homes and significant bill savings.

Going forward, Burbank plans to develop (with customer input) and implement programs to target disadvantaged communities with selected energy efficiency, demand response, and beneficial electrification programs.

Net-Energy Demand in Peak Hours

PUC Section 9621(c) requires POUs to consider 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. Burbank's IRP discusses the use of preferred resources in its portfolio, compared to other resources, to meet peak demand requirements and is consistent with the above requirement.

During summer days in Burbank's service territory renewable generation matches well with peak load. However, on spring days, the non-dispatchable renewable generation generally exceeds peak demand. Burbank will need to sell this excess power to another utility, store it with energy storage for later use, or curtail the energy. Ramping needs caused by intermittent solar resources pose challenges for Burbank, during and around the peak hour.

The utility plans to implement additional time of use rates to shift peak demand to periods of abundant solar generation and remedy over-generation from solar resources. To reduce net-peak demand, Burbank plans to implement additional demand response and energy efficiency programs. The utility also plans to procure additional battery and compressed air energy storage to reduce the intermittency, meet ramping needs of non-dispatchable, variable renewable resources, and reduce peak capacity needs that are normally met with expensive gas fired peaking resources.

Burbank also considers how different types of resources (baseload, load following, peaking, and intermittent) fit with its load profile when making procurement decisions.

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 below. The resource adequacy provisions of this code section are discussed in system reliability section on pages 16 to 18.

Energy Efficiency and Demand Response Resources

Staff finds that Burbank'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 they plan to implement and quantifies the amount of energy efficiency savings they plan to achieve.

Burbank has existing programs for business and residential customers, such as the Energy Solutions programs, providing rebates to businesses for any energy efficiency project or retrofit. This program is the largest commercial program, and saved businesses 6,700,486 kWhs in fiscal year 2016/2017. In fiscal year 2016/2017, Burbank completed its sixth year of providing home energy reports to residential customers to motivate behavioral changes and energy savings. This is Burbank's largest and most efficient residential energy efficiency program, and to date has saved residents 4.6 million kWh.

During fiscal year 2016/2017, Burbank's energy efficiency programs saved businesses and residents 14,145,863 kWhs of energy and 4,551 kWs in peak savings. Burbank plans to continue and expand these and additional energy efficiency programs.

In 2019, Burbank expects to save 160,000 kWh of energy and 400 kW of demand from its programs. By 2030, cumulative energy savings are expected to increase to 349,000,000 kW. The cumulative delivery cost for these programs is estimated at roughly $5 million in 2019 increasing to $94 million by 2030.

Comparing the energy efficiency savings to the SB 350 targets, Burbank meets the energy efficiency doubling goals starting in 2026 and each year after, and reaches 349 GWh of cumulative savings by 2030. **Table 4** compares Burbank's projected energy efficiency savings estimates to its savings target under SB 350.

Burbank worked with a contractor to assess and expand current energy efficiency programs and potential future programs. Some current and future programs:

- Residential AC tune-up and retirement of old in-efficient AC units
- Residential time of use rates
- Decrease EV charging level during outages or periods of low supply
- Home energy reports and residential home improvement programs

- Direct equipment installs and rebate program for businesses

Table 4: Burbank Additional Achievable Energy Efficiency Estimates (GWh)

	AAEE (GWh)	SB 350 targets (GWh)
2018	47.0	47.0
2019	47.2	57.0
2020	47.4	67.0
2021	52.2	78.0
2022	61.8	89.0
2023	76.5	101.0
2024	96.6	113.0
2025	122.4	125.0
2026	154.4	137.0
2027	193.1	148.0
2028	238.8	159.0
2029	291.7	169.0
2030	349.3	

Source: Burbank 2019 IPR filing

Energy Storage

Staff finds that Burbank'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) requires POUs to evaluate the potential of energy storage systems as a resource and establish procurement targets.

Although Burbank currently has no energy storage resources, it is investigating customer, distribution, and transmission level storage resources. For customer-owned storage, Burbank is investigating a form of thermal energy storage by pre-cooling a home. This involves running a home air conditioner during the day when energy is plentiful and cheap so that it does not have to run in the late afternoon and early evening peak, when energy is scarce and prices are expensive.

As previously discussed, Burbank is also exploring a number of supply-side storage technologies including 1/2-hour, 1-hour, 4-hour battery storage, and compressed air energy storage. Burbank is considering the use of compressed air energy storage or long-term batteries to integrate wind and solar resources into the utility's service area, using existing transmission capacity near the IPP site. Burbank's three preferred portfolios include either battery storage, compressed air energy storage, or a combination of both. By 2030, in its preferred portfolio A, Burbank procured 81 MW of energy storage capacity (batteries and compressed air), or roughly 25 percent of its peak capacity requirement.

The utility is working with Southern California Public Power Authority to investigate potential distribution level storage projects to enhance the distribution system. Burbank is looking at decommissioned substations, where the infrastructure is already in place to tie into the existing distribution system, as places to develop battery storage projects.

Transportation Electrification

Staff finds that Burbank's IRP is consistent with the requirement of PUC Section 9621(d)(1)(C), in that it addressed transportation electrification, primarily for light-duty vehicles.

Burbank has various programs to encourage the use of electric vehicles (EV) including EV charger rebates, time of use rates for EV charging, EV ride and drive events, workplace and public charging, and marketing and education. Burbank plans to expand the above programs and incentivize EV charging during the day when there is the potential to mitigate solar over-generation.

Burbank's public charging program started in 2011, and by 2015, Burbank had installed 27 public access level two chargers. In 2016, Burbank installed its first DC fast charger. The utility recently installed an additional 16 level two chargers in the Burbank town center area, which is located in a disadvantaged community. With these charger installations, Burbank now has roughly one EV charger for every 2,500 residents. The utility plans to facilitate additional EV charging throughout the city by requiring new EV charging infrastructure for new or retrofitted developments. This includes pre-installing panel, conduit, wire, and other equipment necessary to run electricity to potential EV chargers and providing sufficient electric capacity for the proposed charging infrastructure.

Burbank used the Energy Commission's light-duty plug-in electric vehicle calculator to help estimate the penetration and impact of EVs within Burbank's service area. Burbank plans to meet its share of the statewide light duty EVs (1.5 million by 2025, statewide). By 2025, Burbank forecasts up to 5,000 EVs in its service territory, with 3,250 registered in Burbank and 1,750 registered elsewhere that use charging infrastructure in Burbank. By 2030, EVs registered in Burbank are expected to increase to roughly 13,000.

The cumulative annual load increase in 2030 due to light duty EV charging is estimated at 15 GWh, or roughly 1.5 percent of Burbank's total energy requirements. This value is consistent with Energy Commission staff estimates of the electrical load associated with the projected number of vehicles. The utility expects light duty EV charging to increase peak demand by 2.6 MW, or 0.8 percent of its peak capacity requirement.

Portfolio Diversification

PUC Section 9621(d)(1)(D) requires that POUs address the procurement of a diversified portfolio of resources consisting of short-term and long-term electricity, electricity related, and demand response products. Based on staff's review of Burbank's existing

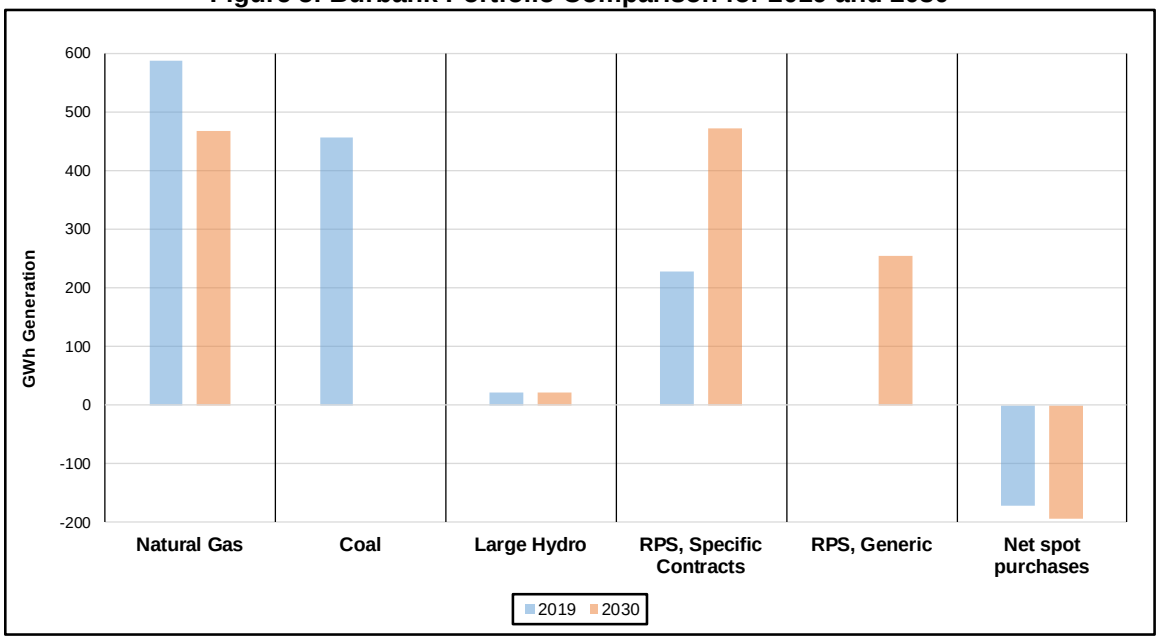
resources, its portfolio analysis, and the selection of resource additions in its IRP, staff concludes that Burbank has fulfilled this requirement.

By 2025, Burbank plans to end its contract with IPP and considers various replacement resources. As previously discussed, Burbank evaluated 12 portfolios and selected three preferred portfolios that would allow for replacing IPP generation, integrating additional renewable energy, and mitigating solar ramping needs. All three preferred portfolios were balanced with roughly half baseload and half intermittent resources. When IPP retires, the utility plans to procure Wyoming wind, Utah solar, battery, and compressed air energy storage to integrate intermittent renewables. To fulfill any RPS shortfalls over the planning horizon, Burbank added generic renewable resources including wind in New Mexico, Nevada, and Arizona, as well as solar in the LADWP service area. To help integrate renewables and reduce costs, Burbank buys and sells in the spot market, and is a net seller for each year in the planning period.

By 2030, Burbank will have transitioned from coal to a portfolio emphasizing solar PV, wind, energy storage, and spot market purchases and sales of energy. This portfolio also maintains the same level of output for the utility's existing renewable and GHG-free resources such as geothermal, nuclear, biofuels, and hydroelectric.

Figure 5 shows a comparison of the energy mix by resource in Burbank's preferred portfolio in 2019 and 2030.

Figure 5: Burbank Portfolio Comparison for 2019 and 2030



Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP filing Energy Balance Table

ACRONYMS

Acronym	Term
AAEE	Additional achievable energy efficiency
AAPV	Additional achievable photovoltaic
Barriers Study	Low-Income Barriers Study, Part A: *Overcoming Barriers to Energy Efficiency and Renewables for Low-Income Customers and Small Business Contracting Opportunities in Disadvantaged Communities*
CARB	California Air Resources Board
CO_2e	Carbon dioxide equivalent
CC	Natural gas combined cycle power plant
CRAT	Capacity Resource Accounting Table
CT	Natural gas combustion turbine
EBT	Energy Balance Table
GEAT	GHG Emissions Accounting Table
GHG	Greenhouse gas
IRP	Integrated resource plan
mt	Metric ton
MT	Thousand metric tons
MMT	Million metric tons
MW	Megawatt
MWh	Megawatt-hour
POU	Publicly owned utility
PUC	Public Utilities Code
RPS	Renewables Portfolio Standard
RPT	RPS Procurement Table
SB 350	Senate Bill 350 (De León, Chapter 547, Statutes of 2015)
ST	Natural gas steam turbine

APPENDIX A: DEFINITIONS

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 photovoltaic (AAPV): Distributed PV developed as a result of the requirement in the California Building Standards that new residential construction include solar PV as of January 1, 2020.

Assumption: A statement made about the future for a given load forecast, or demand-side or supply-side energy resource, that should be used for procurement and transmission modeling.

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)

Bundled renewable energy credit: A renewable energy credit from an eligible renewable energy resource that is procured as part of the same contract or ownership agreement with the underlying energy from that resource.

Committed energy efficiency: Energy efficiency savings estimated to occur from utility and public agency programs, codes, standards, legislation, and ordinances having final authorization, firm funding, and a design that can be readily translated into evaluable characteristics.

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.

Excess balance: Any amount of RPS-eligible RECs that a utility holds at the end of a compliance period that may be used to meet its compliance obligation in the next compliance period. Excess balance can include excess procurement, historic carryover, or purchased RECs that have not been retired.

Filing POU: A local publicly owned electric utility with an annual electrical demand exceeding 700 gigawatt-hours, as determined on a three-year average commencing January 1, 2013.

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.

Net-peak demand: The highest hourly electricity demand in the utility area, when excluding demand met by variable renewable generation resources directly connected to a California balancing authority. Net-peak demand is calculated by taking the highest hourly demand (peak demand) and subtracting the electricity produced by variable renewable resources meeting that demand.

Noncoincident peak demand: The noncoincident peak is the largest amount of power a POU must generate or procure in any hour of the year. Compare this to coincident peak demand which is the amount of power the POU must generate or procure in the hour in which system wide demand is greatest. Noncoincident peak demand is referred to as peak demand throughout these guidelines.

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.

Renewable energy credit (REC): A certificate of proof, as defined in PUC Section 399.12 (h), associated with the generation of electricity from an eligible renewable energy resource. RECs are certificates that represent the environmental attributes or 'greenness' of renewable electricity production.

Renewables Portfolio Standard (RPS): A regulation that requires a minimum procurement of energy from renewable resources, such as wind, solar, biomass, and geothermal.

Renewables Portfolio Standard Portfolio Balance Requirements: The minimum and maximum limits on certain types of bundled and unbundled RECs that may counted toward California's Renewables Portfolio Standard.

Retail sales: Electricity consumption after accounting for behind-the-meter onsite generation including storage charge and discharge. It indicates the net energy delivered through the meter to the customer, and thus excludes any generation or procurement in satisfaction of firm wholesale commitments (for example, firm and spot market sales).

Scenario: A set of assumptions about future conditions used in power system modeling performed to support generation or transmission planning.

Sensitivity: A technique that determines how scenario analysis changes when an assumption is varied with all other scenario assumptions unchanged.

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).

Supporting information: Analyses, studies, data, and work papers, or other material (on which inputs, assumptions, or conclusions are based) that the POU used or relied upon in creating the IRP (such as market conditions current at the time of the analyses, energy infrastructure, state policies and laws, and needs of the filing POU) but are not included in the IRP itself; and additional information required by these guidelines. Supporting Information may also include the inputs and assumptions that are based on the analyses, studies, data, work papers, and other material.

Unbundled renewable energy credit: A renewable energy credit from an eligible renewable energy resource that is not procured as part of the same contract or ownership agreement with the underlying energy from that eligible renewable energy resource; this includes RECs that were originally procured as a bundled product but were subsequently resold separately from the underlying energy.

Appendix B
Summary Tables

Table B-1: Energy Resources, All Years (MWh)

		Technology	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total Net Energy for Load			**1,131,017**	**1,130,895**	**1,125,830**	**1,120,272**	**1,119,348**	**1,114,973**	**1,110,388**	**1,105,523**	**1,100,398**	**1,094,837**	**1,089,478**	**1,087,672**
Non-RPS Resources	Lake 1 CT	natural gas	15,135	18,659	37,005	14,988	13,460	9,335	22,218	16,209	14,244	12,570	13,986	12,633
	Olive 1 ST	natural gas	0	0	0	0	0	0	0	0	0	0	0	0
	Olive 2 ST	natural gas	0	0	0	0	0	0	0	0	0	0	0	0
	Magnolia CC	natural gas	570,875	576,557	617,406	569,786	548,315	509,907	485,046	482,066	492,927	474,152	451,565	453,815
	Intermountain	coal	455,493	459,064	461,933	427,421	403,966	389,772	180,137	0	0	0	0	0
	Hoover	large hydro	20,934	20,941	20,938	20,942	20,940	20,941	20,928	21,153	21,364	21,578	21,794	22,011
	Palo Verde	Nuclear	85,848	86,083	85,848	85,848	85,848	86,083	85,848	85,848	85,848	86,083	85,848	85,848
	Energy Storage	compressed air	0	0	0	0	0	0	0	103,964	103,960	102,678	99,275	106,349
	Spot Purchases	N/A	260,337	331,499	264,431	220,265	246,342	163,879	246,911	278,548	269,334	276,761	329,581	299,887
	Spot Sales	N/A	(431,824)	(665,348)	(769,253)	(617,328)	(590,120)	(694,368)	(640,399)	(510,845)	(515,136)	(508,430)	(540,408)	(493,448)
RPS resources	Ciquita Canyon	landfill gas	4,818	4,831	4,813	4,818	4,816	4,830	4,666	4,788	4,782	4,792	4,781	4,756
	Pleasant Valley	wind	15,660	15,660	15,661	7,264	0	0	0	0	0	0	0	0
	Milford 1	wind	23,485	23,696	23,485	23,485	23,485	23,696	23,485	23,485	23,485	23,696	20,807	-
	Copper Mountain	solar PV	91,137	91,150	91,137	91,137	91,137	91,150	91,137	91,137	91,137	91,150	91,137	91,137
	Wyoming Wind	wind	0	0	0	0	0	102,967	191,487	191,487	191,487	192,063	191,487	191,487
	Tieton	small hydro	28,845	28,845	28,845	28,845	28,845	28,845	28,845	28,845	28,845	28,845	28,845	28,845
	Pebble Springs	wind	36,720	36,720	36,720	36,720	36,720	36,720	36,720	36,720	36,720	0	0	0
	Don Campbell 1	geothermal	26,230	26,352	26,254	26,255	26,256	26,352	26,255	26,256	26,255	26,352	26,256	26,256
	IPP Solar	solar PV	0	0	0	0	0	135793.9355	134843.378	133899.4743	132962.178	132031.4428	131107.2227	130189.4721
	Generic Solar	solar PV	0	42,594	42,495	42,495	42,495	42,594	42,495	42,495	42,495	42,594	42,495	42,495
	Generic Wind	wind	0	107,497	212,906	212,928	212,921	213,219	212,925	212,920	212,923	213,221	212,923	212,923
	Undelivered RPS	NA	(72,677)	(73,904)	(74,795)	(75,598)	(76,078)	(76,743)	(83,160)	(163,453)	(163,234)	(125,301)	(122,001)	(127,513)
Total Energy procured		N/A	**1,131,017**	**1,130,895**	**1,125,830**	**1,120,272**	**1,119,348**	**1,114,973**	**1,110,388**	**1,105,523**	**1,100,398**	**1,094,837**	**1,089,478**	**1,087,672**
Surplus/(Shortfall)		N/A	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP filing Energy Balance Table

Table B-2: Capacity Resources, All years (MW)

		Technology	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Peak Demand			308	306	306	308	310	311	310	309	309	309	310	310
Planning Reserve Margin			28	27	27	27	27	15	24	26	29	26	26	26
Peak Procurement Requirement			**335**	**333**	**332**	**330**	**329**	**314**	**320**	**321**	**323**	**318**	**317**	**316**
Non-RPS Resources	Lake 1 CT	natural gas	48	48	48	48	48	48	48	48	48	48	48	48
	Olive 1 ST	natural gas	42	42	42	42	42	42	42	42	42	42	42	42
	Olive 2 ST	natural gas	47	47	47	47	47	47	47	47	47	47	47	47
	Magnolia CC	natural gas	89	89	89	89	89	89	89	89	89	89	89	89
	IPP replacement	natural gas	0	0	0	0	0	0	35	0	0	0	0	0
	Intermountain	coal	74	74	74	74	74	74	0	0	0	0	0	0
	Hoover	large hydro	20	20	20	20	20	20	20	20	20	20	20	20
	Palo Verde	Nuclear	10	10	10	10	10	10	10	10	10	10	10	10
	Energy Storage	compressed air	0	0	0	0	0	0	27	54	54	54	54	54
	Energy Storage	battery	0	0	0	0	0	0	13.5	27	27	27	27	27
RPS resources	Ciquita Canyon	landfill gas	1	1	1	1	1	1	1	1	1	1	1	1
	Pleasant Valley	wind	2	2	2	1	0	0	0	0	0	0	0	0
	Milford 1	wind	3	3	3	3	3	3	3	3	3	3	2	0
	Copper Mountain	solar PV	12	12	12	12	12	12	12	12	12	12	12	12
	Wyoming Wind	wind	0	0	0	0	0	14	14	14	14	14	14	14
	Tieton	small hydro	6	6	6	6	6	6	6	6	6	6	6	6
	Pebble Springs	wind	3	3	3	3	3	3	3	3	3	0	0	0
	Don Campbell 1	geothermal	2	2	2	2	2	2	2	2	2	2	2	2
	IPP Solar	solar PV	0	0	0	0	0	13	13	13	13	13	13	13
	Generic Solar	solar PV	0	6	6	6	6	6	6	6	6	6	6	6
	Generic Wind	wind	0	9	17	17	17	17	17	17	17	17	17	17
Total Capacity Procured			**359**	**373**	**381**	**380**	**379**	**406**	**410**	**413**	**413**	**410**	**409**	**407**
Surplus/(Shortfall)			**24**	**41**	**49**	**50**	**50**	**92**	**90**	**93**	**91**	**92**	**92**	**91**

Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP filing Capacity Resource Accounting Table

Table B-3: GHG Emissions from Burbank's Resource Portfolio, All Years

	Fuel Type	GHG Intensity (mt CO_2e/ MWh)	Total Emissions (MT CO_2e)											
			2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Lake 1 CT	natural gas	0.550	8	10	21	8	7	5	12	9	8	7	8	7
Olive 1 ST	natural gas	0.650	0	0	0	0	0	0	0	0	0	0	0	0
Olive 2 ST	natural gas	0.650	0	0	0	0	0	0	0	0	0	0	0	0
Magnolia CC	coal	0.395	225	228	244	225	217	201	192	190	195	187	178	179
Intermountain	coal	0.925	421	425	427	395	374	361	167	0	0	0	0	0
Storage (compressed air)	natural gas	0.230	0	0	0	0	0	0	0	24	24	24	23	25
Spot market purchases	system	0.428	111	142	113	94	105	70	106	119	115	118	141	128
Portfolio emissions	portfolio	NA	767	805	805	723	703	637	476	343	342	337	350	339
Emissions adjustments														
Undelivered RPS energy (MWh)	NA	NA	72,677	73,904	74,795	75,598	76,078	76,743	83,160	163,453	163,234	125,301	122,001	127,513
Emisisons adjustment from undelivered RPS energy	NA	0.428	(31)	(32)	(32)	(32)	(33)	(33)	(36)	(70)	(70)	(54)	(52)	(55)
Emissions adjustment due to spot market sales	system	0.428	(185)	(285)	(329)	(264)	(253)	(297)	(274)	(219)	(220)	(218)	(231)	(211)
Adjusted portfolio emissions	portfolio	NA	551	488	444	426	418	307	167	54	52	65	67	73

Source: California Energy Commission, Energy Assessments Division, based on Burbank's 2019 IRP Greenhouse Gas Emission Accounting Table

Attachment I
Public Utilities Code for SB 350

PUBLIC UTILITIES CODE - PUC

DIVISION 4.9. RESTRUCTURING OF PUBLICLY OWNED ELECTRIC UTILITIES IN CONNECTION WITH THE RESTRUCTURING OF THE ELECTRICAL SERVICES INDUSTRY [9600 - 9622]

(Division 4.9 added by Stats. 1996, Ch. 854, Sec. 12.)

9621.

(a) This section shall apply to a local publicly owned electric utility with an annual electrical demand exceeding 700 gigawatt hours, as determined on a three-year average commencing January 1, 2013.

(b) On or before January 1, 2019, the governing board of a local publicly owned electric utility shall adopt an integrated resource plan and a process for updating the plan at least once every five years to ensure the utility achieves all of the following:

(1) Meets the greenhouse gas emissions reduction targets established by the State Air Resources Board, in coordination with the commission and the Energy Commission, for the electricity sector and each local publicly owned electric utility that reflect the electricity sector's percentage in achieving the economy-wide greenhouse gas emissions reductions of 40 percent from 1990 levels by 2030.

(2) Ensures procurement of at least 50 percent eligible renewable energy resources by 2030 consistent with Article 16 (commencing with Section 399.11) of Chapter 2.3 of Part 1 of Division 1.

(3) Meets the goals specified in subparagraphs (D) to (H), inclusive, of paragraph (1) of subdivision (a) of Section 454.52, and the goal specified in subparagraph (C) of paragraph (1) of subdivision (a) of Section 454.52, as that goal is applicable to each local publicly owned electric utility. A local publicly owned electric utility shall not, solely by reason of this paragraph, be subject to requirements otherwise imposed on electrical corporations.

(c) In furtherance of the requirements of subdivision (b), the governing board of a local publicly owned electric utility shall consider the role of existing renewable generation, grid operational efficiencies, energy storage, and distributed energy resources, including energy efficiency, in helping to ensure each utility meets energy needs and reliability needs in hours to encompass the hour of peak demand of electricity, excluding demand met by variable renewable generation directly connected to a California balancing authority, as defined in Section 399.12, while reducing the need for new electricity generation resources and new transmission resources in achieving the state's energy goals at the least cost to ratepayers.

(d)(1) The integrated resource plan shall address procurement for the following:

(A) Energy efficiency and demand response resources pursuant to Section 9615.

(B) Energy storage requirements pursuant to Chapter 7.7 (commencing with Section 2835) of Part 2 of Division 1.

(C) Transportation electrification.

(D) A diversified procurement portfolio consisting of both short-term and long-term electricity, electricity-related, and demand response products.

(E) The resource adequacy requirements established pursuant to Section 9620.

(2)(A) The governing board of the local publicly owned electric utility may authorize all source procurement that includes various resource types, including demand-side resources, supply side resources, and resources that may be either demand-side resources or supply side resources, to ensure that the local publicly owned electric utility procures the optimum resource mix that meets the objectives of subdivision (b).

(B) The governing board may authorize procurement of resource types that will reduce overall greenhouse gas emissions from the electricity sector and meet the other goals specified in subdivision (b), but due to the nature of the technology or fuel source may not compete favorably in price against other resources over the time period of the integrated resource plan.

(e) A local publicly owned electric utility shall satisfy the notice and public disclosure requirements of subdivision (f) of Section 399.30 with respect to any integrated resource plan or plan update it considers.

(Amended by Stats. 2017, Ch. 389, Sec. 2. (SB 338) Effective January 1, 2018.)

PUBLIC UTILITIES CODE - PUC

DIVISION 1. REGULATION OF PUBLIC UTILITIES [201 - 3260]

(Division 1 enacted by Stats. 1951, Ch. 764.)

PART 1. PUBLIC UTILITIES ACT [201 - 2120]

(Part 1 enacted by Stats. 1951, Ch. 764.)

CHAPTER 3. Rights and Obligations of Public Utilities [451 - 651]

(Chapter 3 enacted by Stats. 1951, Ch. 764.)

ARTICLE 1. Rates [451 - 467]

(Article 1 enacted by Stats. 1951, Ch. 764.)

454.52.

(a)(1) Beginning in 2017, and to be updated regularly thereafter, the commission shall adopt a process for each load-serving entity, as defined in Section 380, to file an integrated resource plan, and a schedule for periodic updates to the plan, to ensure that load-serving entities do the following:

(A) Meet the greenhouse gas emissions reduction targets established by the State Air Resources Board, in coordination with the commission and the Energy Commission, for the electricity sector and each load-serving entity that reflect the electricity sector's percentage in achieving the economy-wide greenhouse gas emissions reductions of 40 percent from 1990 levels by 2030.

(B) Procure at least 50 percent eligible renewable energy resources by December 31, 2030, consistent with Article 16 (commencing with Section 399.11) of Chapter 2.3.

(C) Enable each electrical corporation to fulfill its obligation to serve its customers at just and reasonable rates.

(D) Minimize impacts on ratepayers' bills.

(E) Ensure system and local reliability.

(F) Strengthen the diversity, sustainability, and resilience of the bulk transmission and distribution systems, and local communities.

(G) Enhance distribution systems and demand-side energy management.

(H) Minimize localized air pollutants and other greenhouse gas emissions, with early priority on disadvantaged communities identified pursuant to Section 39711 of the Health and Safety Code.

(2)(A) The commission may authorize all source procurement for electrical corporations that includes various resource types including demand-side resources, supply side resources, and resources that may be either demand-side resources or supply side resources, taking into account the differing electrical corporations' geographic service areas, to ensure that each load-serving entity meets the goals set forth in paragraph (1).

(B) The commission may approve procurement of resource types that will reduce overall greenhouse gas emissions from the electricity sector and meet the other goals specified in paragraph (1), but due to the nature of the technology or fuel source may not compete favorably in price against other resources over the time period of the integrated resource plan.

(3) In furtherance of the requirements of paragraph (1), the commission shall consider the role of existing renewable generation, grid operational efficiencies, energy storage, and distributed energy resources, including energy efficiency, in helping to ensure each load-serving entity meets energy needs and reliability needs in hours to encompass the hour of peak demand of electricity, excluding demand met by variable renewable generation directly connected to a California balancing authority, as defined in Section 399.12, while reducing the need for new electricity generation resources and new transmission resources in achieving the state's energy goals at the least cost to ratepayers.

(b)(1) Each load-serving entity shall prepare and file an integrated resource plan consistent with paragraph (2) of subdivision (a) on a time schedule directed by the commission and subject to commission review.

(2) Each electrical corporation's plan shall follow the provisions of Section 454.5.

(3) The plan of a community choice aggregator shall be submitted to its governing board for approval and provided to the commission for certification, consistent with paragraph (5) of subdivision (a) of Section 366.2, and shall achieve the following:

(A) Economic, reliability, environmental, security, and other benefits and performance characteristics that are consistent with the goals set forth in paragraph (1) of subdivision (a).

(B) A diversified procurement portfolio consisting of both short-term and long-term electricity and electricity-related and demand reduction products.

(C) The resource adequacy requirements established pursuant to Section 380.

(4) The plan of an electric service provider shall achieve the goals set forth in paragraph (1) of subdivision (a) through a diversified portfolio consisting of both short-term and long-term electricity, electricity-related, and demand reduction products.

(c) To the extent that additional procurement is authorized for the electrical corporation in the integrated resource plan or the procurement process authorized pursuant to Section 454.5, the commission shall ensure that the costs are allocated in a fair and equitable manner to all customers consistent with Section 454.51, that there is no cost shifting among customers of load-serving entities, and that community choice aggregators may self-provide renewable integration resources consistent with Section 454.51.

(d) To eliminate redundancy and increase efficiency, the process adopted pursuant to subdivision (a) shall incorporate, and not duplicate, any other planning processes of the commission.

(e) This section applies to an electrical cooperative, as defined in Section 2776, only if the electrical cooperative has an annual electrical demand exceeding 700 gigawatt hours, as determined based on a three-year average commencing with January 1, 2013.

(Amended by Stats. 2018, Ch. 92, Sec. 174. (SB 1289) Effective January 1, 2019.)