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STAFF REPORT

Review of Anaheim Public Utilities 2023 Integrated Resource Plan

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ABSTRACT

Senate Bill 350 (De León, Chapter 547, Statutes of 2015), (Public Utilities Code Section 9622) 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. Anaheim Public Utilities submitted its *2023 Integrated Resource Plan* and supplemental information for review on June 13, 2023. This staff paper presents the results of the Energy Commission staff review of the *Anaheim Public Utilities 2023 Integrated Resource Plan*.

Keywords: Publicly owned utility, integrated resource plan, Anaheim Public Utilities, APU, demand, resources, portfolio, generation, transmission, distribution, Renewables Portfolio Standard, forecast, energy efficiency, transportation electrification, demand response, greenhouse gas, GHG, emissions, system reliability

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EXECUTIVE SUMMARY

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

The *Anaheim Public Utilities Integrated Resource Plan* serves as a long-term comprehensive roadmap to continue Anaheim Public Utilities' long-standing focus on customers by balancing the demand and supply-side factors of the electric utility. Their forecasted demand takes into account energy efficiency savings, customer-owned distributed energy resources, electric vehicle demand, and building electrification. Their resource planning process included a focus on decarbonization strategies while also meeting statutory and regulatory requirements for reliability, greenhouse gas emissions, Renewable Portfolio Standards requirement, and energy efficiency. To achieve this roadmap, Anaheim Public Utilities is focused on transitioning from coal to clean energy resources while identifying savings, partnerships, and grants to help maintain reasonable rates.

In reviewing the *Anaheim Public Utilities Integrated Resource Plan* and determining consistency with the requirements of Public Utilities Code Section 9621, California Energy Commission staff relied on the four standardized reporting tables and narrative descriptions in the integrated resource plan filing, as well as analysis and verification of the materials submitted. Staff presents the following conclusions in accordance with the requirements:

- *Achieving Greenhouse Gas Emissions Targets and Renewables Portfolio Standard Requirements:* The utility plans to meet the greenhouse gas emission reduction requirements of Public Utilities Code Section 9621(b)(1), and the renewable energy procurement requirement of Public Utilities Code Section 9621(b)(2). Anaheim Public Utilities plans on reducing greenhouse gas emissions by transitioning its power supply from carbon-intensive resources such as coal to low-emission renewable resources. Further, greenhouse gas emission reductions can be realized through complementary efforts including continued energy efficiency measures, adding local solar generation and energy storage, as well as through the electrification of homes and the transportation sector.
- *Meeting Planning Goals:* The utility intends to meet planning goals related to retail rates, reliability, transmission and distribution systems as set forth in Public Utilities Code Section 9621(b)(3). Anaheim Public Utilities plans to achieve an additional 15 percent capacity over the forecasted system peak demand while increasing flexibility, reliability and operational performance. The electric rates have been consistently lower than adjacent investor-owned

utilities and the utility expects to maintain affordable rates throughout the planning period. Anaheim Public Utilities is within California Independent System Operator's balancing authority territory and evaluates the short-term and long-term infrastructure needs during California Independent System Operator's annual Transmission Planning Process. Anaheim has a long-standing reputation for providing its customers with highly reliable electric distribution services over a robust and well-maintained electric distribution system. In 2020, the American Public Power Association recognized Anaheim Public Utilities as a Reliable Public Power Provider. Of the 2,000 public power utilities nation-wide, only 275 hold the Reliable Public Power Provider designation.

- *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 to ensure the utility's energy and reliability needs in the hours that encompass the peak hour as set forth in Public Utilities Code Section 9621(c). Anaheim Public Utilities uses the peak forecast to determine the Resource Adequacy capacity needs, explore possibilities in using clean energy to meet the peak demand, and distribution system expansion. Historically, Anaheim Public Utilities has had a flat demand. Recent forecasts for peak demand appear to be lower than recent years mostly due to the assumption of normal weather conditions rather than the incorporation of heat shocks in the base model.
- *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 Public Utilities Code Section 9621(d). Anaheim Public Utilities' Power Supply Forecast, developed on an annual basis, assesses the resource supply portfolio and a projection of customer energy and peak demand requirements. This assessment results in a 20-year projection that includes all contracted projects, potential projects, and other viable technologies to fill resource needs to meet legislative mandates and California Independent System Operator reliability requirements.

CHAPTER 1: Demand Forecast and Procurement

Introduction

Senate Bill 350 (De León, Chapter 547, Statutes of 2015) requires publicly owned utilities (POU) with an annual electrical demand exceeding 700-gigawatt hours (GWh) to develop integrated resource plans (IRPs) (California Public Utilities Code (PUC) Section 9621). 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 by January 1, 2019.¹ Anaheim Public Utilities (APU) filed the initial APU IRP with the CEC in 2018, which was found to be consistent with SB 350 and the requirements of PUC Section 9621.

PUC Section 9622 requires the California Energy Commission (CEC) to review POU IRPs to ensure they achieve PUC Section 9621 provisions. If the CEC determines an IRP is inconsistent with the requirements of PUC Section 9621, the CEC shall provide recommendations to correct the deficiencies. The CEC adopted the *Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines (Guidelines)* to govern the submission of the POU's IRPs.²

This chapter outlines the CEC's review process and provides an overview of the APU 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.

Anaheim Public Utilities

APU is a municipally owned, vertically integrated, electric utility that provides electricity and water to Orange County as shown below. It has approximately 350,000 residents and over 15,000 businesses within a service area of 50 square miles. It has historical average electric sales of about 2400 GWh annually and peak loads of approximately 600 MW.

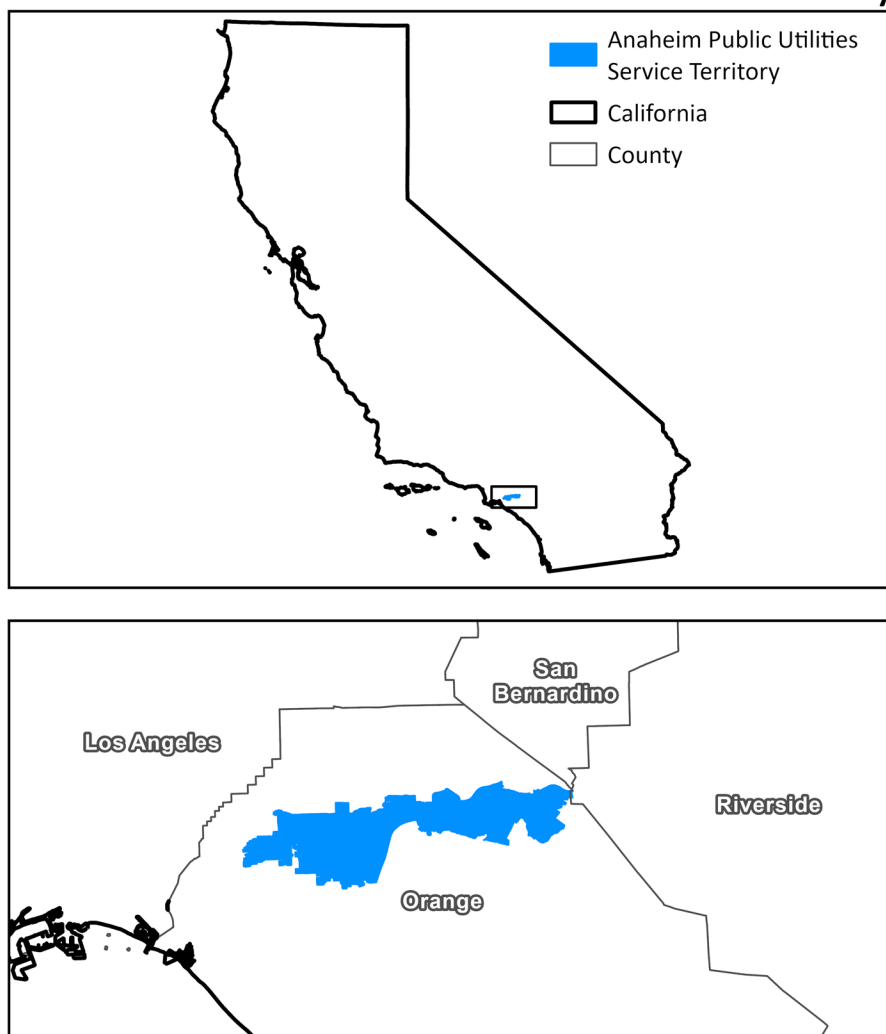
The 2023 IRP includes APU's most recent update to its renewable energy resource procurement plan, which is in accordance with the 60 percent renewable energy by 2030 target established in 2018 through Senate Bill 100 (De León, Chapter 312, Statutes of 2018).

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

2 CEC. October 2018. [Publicly Owned Utility Integrated Resource Plan Submission and Review Guidelines - Revised Second Edition \(Chapter 2.E.1\)](https://efiling.energy.ca.gov/GetDocument.aspx?tn=224889&DocumentContentId=55481).
<https://efiling.energy.ca.gov/GetDocument.aspx?tn=224889&DocumentContentId=55481>.

Figure 1: Map of Anaheim Public Utilities Service Territory

Anaheim Public Utilities Service Territory



Source: CEC

APU Planning Process

The development of the *Anaheim Public Utilities 2023 Integrated Resource Plan (APU 2023 IRP)* focused on six criteria: Renewables Portfolio Standard (RPS) & Emission Reduction Goals, Regulatory Risk, Resource Adequacy, Portfolio Diversification, Expected Cost, and Market Exposure. The Anaheim City Council is responsible for approving the IRP while the Executive Oversight Group is ultimately responsible for developing and implementing the IRP. To educate stakeholders about this IRP process, purpose, and goals, APU held two public meetings. The Public Utilities Board is comprised of seven Anaheim residents who are appointed to staggered four-year terms by members of the Anaheim City Council. Upon the Public Utilities Board's recommendation of approval, the IRP is presented to the Anaheim City

Council at a subsequent meeting allowing for further public comment. The Anaheim City Council approved and adopted the *APU 2023 IRP* on May 16, 2023.

Energy and Peak Demand Forecast, Method and Assumptions

The *Guidelines* identify the need for a forecast of energy and peak demand to determine whether a POU's IRP is consistent with the requirements of PUC Section 9621.³ The *Guidelines* also state that the POU must provide information on the method used in developing the demand forecast if a POU uses a forecast other than the CEC's adopted demand forecast.⁴ The demand forecast and supporting information provided present an adequate representation of future energy and peak demand that meets the *Guidelines* requirements.

APU determines energy demand forecast by establishing the base energy demand. This is accomplished by using a 5-year running average of historical temperature with traditional econometric forecasting techniques to develop relational equations that reflect historic consumption trends. Once the base energy demand is set, the forecast is adjusted by taking into consideration residential and commercial projects within the City of Anaheim through a collaboration with APU Electric System Planning, and Community & Sustainability Programs.

APU plans for a 1-in-2 normal weather year and has a forecast total peak hour 1-in-2 demand of 511 MW in 2025. When adjusted to include customer-side solar, thermal energy storage, demand response, and additional achievable energy efficiency, *APU 2023 IRP* plans for a peak procurement requirement of 517 MW in 2030. APU's planning reserve margin is 15 percent for a total of 594 MW of total peak procurement requirement in 2030. While system expansion and electric vehicle (EV) growth increases the energy demand, solar installation and energy efficiency (EE) programs reduces the energy demand, causing APU's average energy demand growth of 0.2 percent per year from 2030 to 2040.

The CEC's California Energy Demand 2023-2040 Forecast – Planning Forecast 1-in-2 Net Electricity Peak Demand projects a low of 485 MW and high of 518 MW peak demand for 2030 for APU. Accordingly, staff found the APU demand forecast to be in the acceptable range.

Resource Procurement Plan

The POU IRP Guidelines require that POUs report the mix of resources they plan to use to meet demand through 2030.⁵ 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 *APU 2023 IRP* filing meets these requirements.

3 *POU IRP Guidelines*, Chapter 2, E., pp. 5-6

4 Given the timing of these POU IRP submittals the adopted forecast vintage is the 2022 CED Update. [California Energy Demand Update, 2022-2035](#).

5 POU IRP Guidelines, Chapter 2.F., P. 6.

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.

Existing Resources

APU has existing long-term contracts of resources ranging from coal, natural gas-fired power plants and hydroelectric facilities totaling 580 MW in the system. Historically, APU has heavily relied on coal but ended their contract early from San Juan Coal Power Plant in 2017 and transitioned to renewable resources. APU notes that the Intermountain Power Plant (IPP) coal facility will be converted to a natural gas facility in 2025, reducing the total capacity from 236 MW to 111 MW. APU will continue to take energy from IPP until the original 40-year contract expire on June 17, 2027.

Resource Portfolio Evaluation

APU's goal is to optimize the resource mix to meet demand while maintaining affordable rates, high reliability, and using sustainable resources. Historically, APU's resource mix has always included coal to help meet demand. In 2012, coal represented 43 percent of APU's resources portfolio, while in 2022, coal represented 23 percent. APU's contract with the remaining coal facility, IPP, is set to expire in 2027. In 2025, IPP plans to convert the facility into a natural gas power plant.

Within APU's resource mix, only Anaheim Solar Energy Plant and Solar for Schools are utility-owned providing 10 GWh and 7 GWh respectively, for each compliance period starting Compliance Period 5. The remaining resource portfolio mix are Power Purchase Agreements. Both Magnolia and Canyon natural gas power plants were analyzed by the APU 2023 IRP. While Magnolia is a baseload unit with peaking capability, Canyon is a peaking resource. With Intermountain Power Plant contract ending in 2027, APU needs to determine the planning horizon of Magnolia and Canyon Power Plants after the expected end dates of 2037 and 2041, respectively.

APU considered the following three portfolios for the *APU 2023 IRP*.

- Reliability Portfolio: Both Magnolia and Canyon Power Plants are preserved as natural gas power plants, serving capacity and energy to APU customers and the California Independent System Operator (California ISO) system when renewable resources are not available.
- Renewable Natural Gas (RNG) Portfolio: The Magnolia Power Plant will be certified as an RPS unit when using RNG as fuel by 2031. This option assumes that ample RNG supplies will become available by 2031 and APU can secure long-term RNG contract(s). Currently, there is no commodity market for RNG projects. The costs of RNG ranging from \$10 to \$40 per metric million British thermal unit dependent on the size, location, and technology.
- Zero-Emissions Portfolio: APU exits both Magnolia and Canyon Power Plants at the expected end dates in 2037 and 2041, respectively. New renewable, storage or hybrid resources are procured to fill the capacity and energy shortfall.

APU has six performance criteria which it measured each portfolio against. Those criteria are: RPS & emission reduction goals, regulatory risk, resource adequacy, portfolio diversification, expected cost, and market exposure. Each portfolio was ranked with 1 being the worst performance and 3 being the best performance within that group as shown in Table 1 below.

Table 1: APU Portfolio Scenarios and Performance Measure

Performance Measure	Reliability	RNG	Zero Emissions
RPS & Emission Reduction Goals	1	3	2
Regulatory Risk	3	1	2
Resource Adequacy	3	3	1
Portfolio Diversification	1	2	3
Expected Cost	3	1	2
Market Exposure	3	1	2
Total	14	11	12

Source: APU 2023 IRP

Overall, the Reliability Portfolio ranked the highest and APU used this scenario for planning. Under RPS & Emission Reduction Goals, all three portfolio scenarios met the RPS requirement, so they were ranked based on greenhouse gas (GHG) emissions. The Reliability Portfolio was ranked the worse in the RPS & Emission Reduction category since Magnolia and Canyon Power Plants are kept as natural gas power plants while in other scenarios, Magnolia starts using RNG fuel or exits APU's portfolio completely. The Resource Adequacy for both the Reliability scenario and RNG scenario were the same, so a rank of 3 was given to both scenarios while the Zero Emissions scenario was ranked last. As for Portfolio Diversification, the Reliability Portfolio wouldn't require as much firm renewable resources as the other portfolios. This caused the Reliability Portfolio to be the least diverse compared to the other two portfolios. The Reliability Portfolio is estimated to have a lower overall power supply cost, offers the highest amount of firm resource capacity, and a declining reliance on natural gas power plants. It also has the least amount of regulatory risk and market exposure while achieving both the RPS requirements and emission reduction goals.

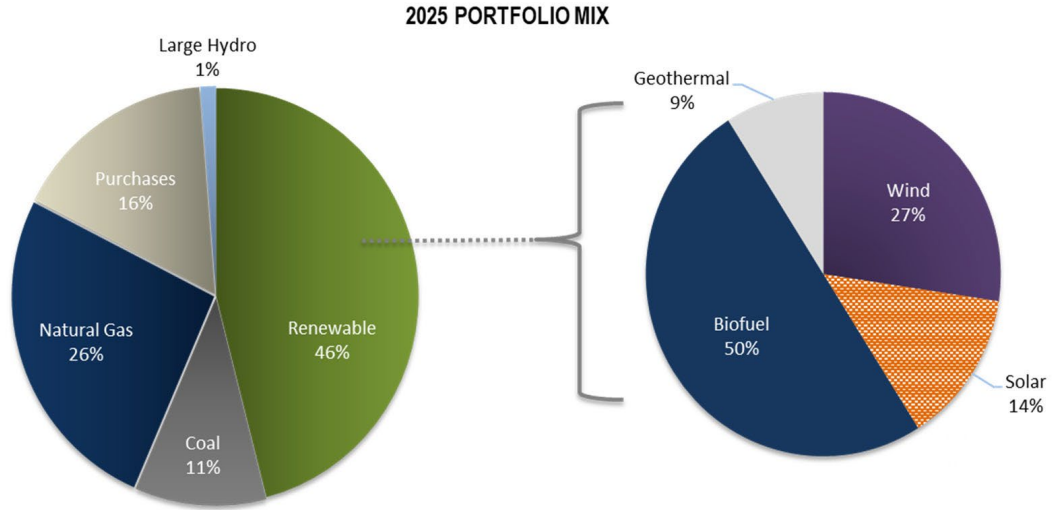
Procurement Strategy

APU's Integrated Resources Division is responsible for managing APU's energy resource portfolio. To manage the portfolio this division develops an annual Power Supply Forecast including, but not limited to, projection of customer energy and peak demand requirements. This results in 20-year projections that include all contracted projects, potential projects, and

other viable technologies to meet California ISO reliability requirements and legislative mandates.

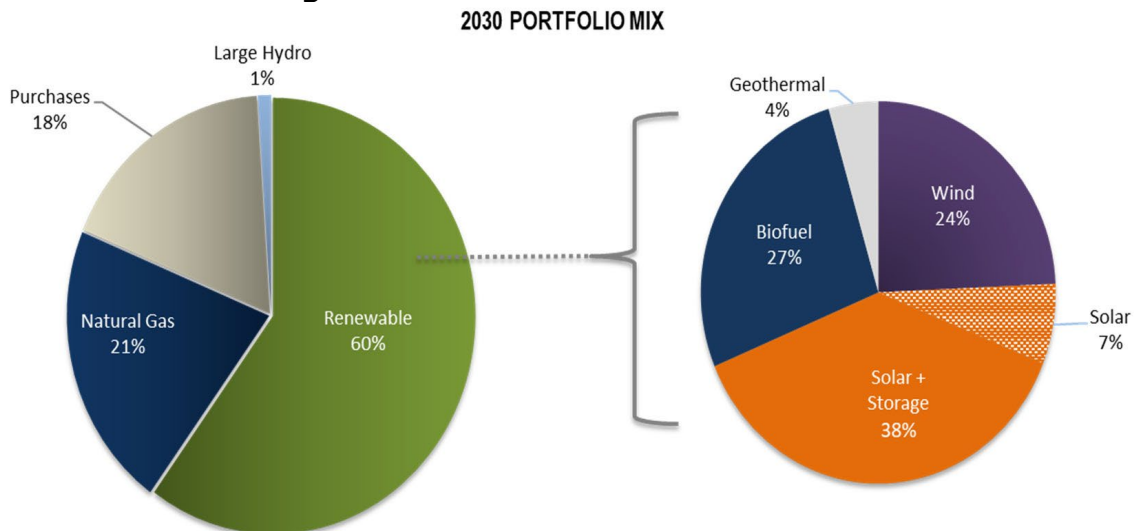
Under the Reliability Portfolio, APU plans to add cost-effective resources including utility-scale solar plus battery storage, solar, and wind, as existing contractual obligations end over time. Adding these resources will allow APU to gradually decrease fossil-fuel generation over time while maintaining grid reliability. The new resources recommended by the optimization model runs will meet RPS requirements and constraints, planning reserve margins, environmental goals, reliability, and costs. Figures 2-5 shown below are APU's planned portfolio mix in five-year increments.

Figure 2: APU's 2025 Portfolio Mix



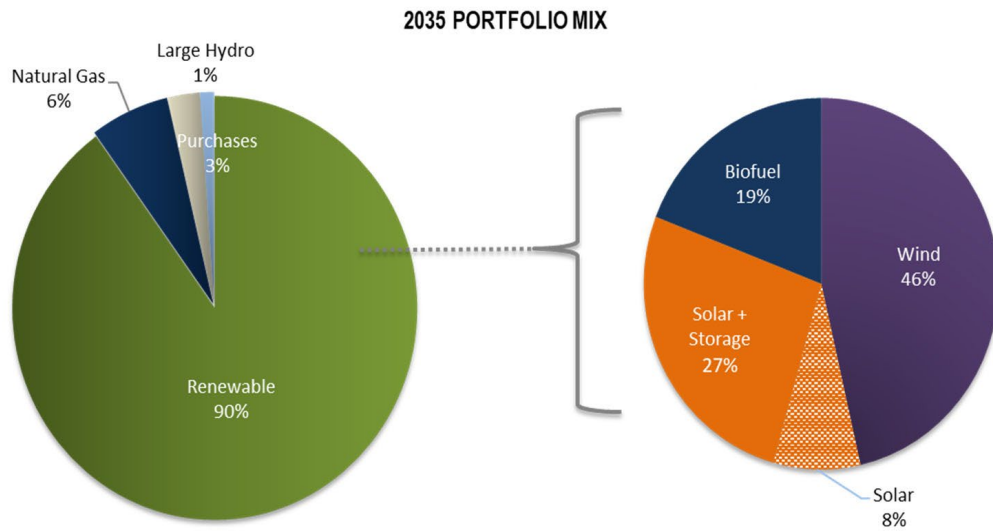
Source: *APU 2023 IRP*

Figure 3: APU's 2030 Portfolio Mix



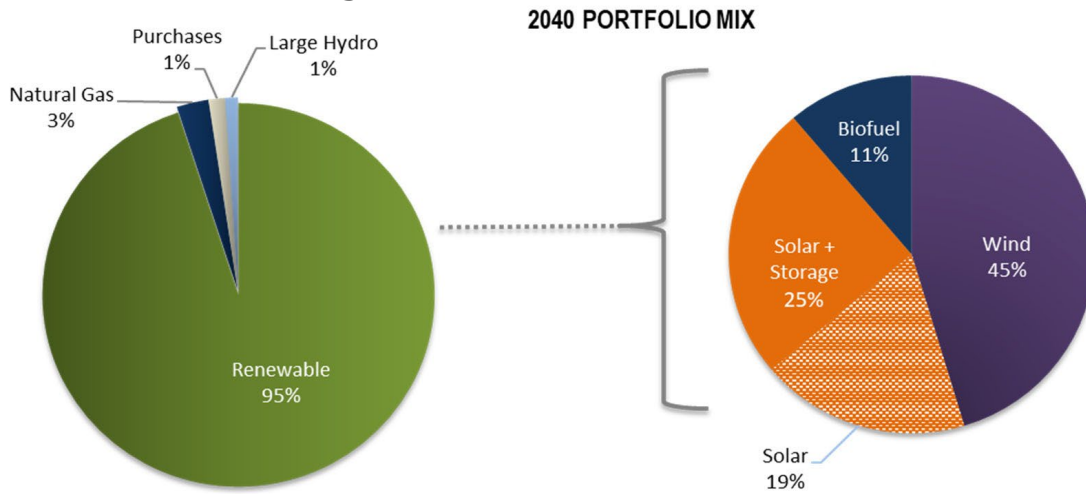
Source: *APU 2023 IRP*

Figure 4: APU's 2035 Portfolio Mix



Source: *APU 2023 IRP*

Figure 5: APU's 2040 Portfolio Mix



Source: *APU 2023 IRP*

CHAPTER 2:

Review for Consistency with PUC Section 9621 Requirements

This chapter summarizes the main elements of the *APU 2023 IRP* and provides staff's findings regarding the consistency of the IRP filing with PUC Section 9621 requirements, as well as the *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.⁶ The initial GHG targets set by CARB reflect the electricity sector's percentage in achieving the economy wide GHG emission reductions of 40 percent from 1990 levels by 2030. Staff finds that APU plans to achieve the established GHG emission target range of 30-53 million metric tons of carbon dioxide equivalent (MMT CO₂e) published in the *SB 350 IRP Electric Sector GHG Planning Targets: 2020 Update (2020 CARB Update)*. The APU preferred resource portfolio results are in compliance with the requirement of PUC Section 9621(b)(1).

In 2023, the electricity sector GHG planning target range was brought into alignment with CARB's *2022 Scoping Plan for Achieving Carbon Neutrality* adopted in September 2023 (*2023 CARB Update*).¹⁴ The electricity sector GHG planning target range retains the lower bound of 30 MMTCO₂e from the *2020 CARB Update* but reduces the upper bound from 53 to 38 MMTCO₂e. It is important to note that the *2023 CARB Update* electricity sector GHG emission targets were published after APU's IRP analysis was complete.

The IRP preferred portfolio will allow APU to meet the target range under its utility-specific *2020 CARB Update* GHG target of 305,000 – 538,000 MTCO₂e as well as the *2023 CARB Update* target of 305,000 – 386,000 MTCO₂e. CEC staff reviewed the GHG emissions associated with APUs preferred portfolio of resources in 2030 and independently assessed the emission factors associated with various resources in APU's portfolio to ensure consistency with other data available.

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

APU's preferred portfolio results in roughly 339,000 MTCO₂e, consistent with the requirement of PUC Section 9621(b)(1). Table 2 shows GHG emissions for APU's preferred portfolio of resources in 2023, 2025, and 2030.

Table 2: Greenhouse Gas Emissions from APU Resources Portfolio

	Fuel Type	GHG Intensity (MTCO₂e per MWh)	Total Emissions (MTCO₂e) 2023	Total Emissions (MTCO₂e) 2025	Total Emissions (MTCO₂e) 2030
Canyon Power Project	Natural Gas	0.572	45,089	62,666	55,065
Hoover	Natural Gas	0	0	0	0
Intermountain Power Plant Unit 1	Natural Gas	0.936	466,180	173,275	0
Intermountain Power Plant Unit 2	Natural Gas	0.936	472,704	170,799	0
Magnolia	Natural Gas	0.408	226,545	186,190	225,568
Magnolia Peak	Renewable Natural Gas	0.408	415	206	0
Intermountain Power Plant Gas Unit	Renewable Natural Gas	0.408	0	140,423	0
Net Spot market purchases (sales)	Renewable Natural Gas	0.252	-57,449	65,309	58,355
Total Portfolio emissions	NA	NA	1,153,485	798,868	338,988

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

Renewables Portfolio Standard Planning Requirements

PUC Section 9621(b)(2), as established by SB 350, requires that POU IRPs ensure procurement of at least 50 percent renewable energy resources by 2030, consistent with Article 16 (commencing with Section 399.11) of Chapter 2.3. In 2018, SB 100 increased the RPS requirement for 2030 from 50 to 60 percent.⁷

⁷ Public Resources Code Section 399.11(a).

APU's renewable procurement plans include solar projects, such as the Anaheim Solar Energy Plant, Solar for Schools, Westlands, EDF Desert Harvest Solar and the future addition of EDF Sapphire Solar Hybrid; geothermal such as Cryq (Thermo); landfill/biogas gas such as Bowerman and Broadrock (Ridgewood); and wind such as Iberdrola Pleasant Valley and San Gorgonio Wind Farm. APU anticipates that RPS-eligible renewables will account for 60 percent of retail sales in 2030, in compliance with RPS target of 60 percent in 2030.

Staff reviewed the renewable procurement table, the discussion in the IRP filing, and the renewable procurement plan submitted and finds that APU'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).

Retail Rates

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

APU believes divesting its coal assets and utilizing its peaking resources to integrate more renewable purchases will allow it to meet planning goals with a lower overall power supply cost. A demand charge rate is included in the medium commercial, large commercial, and industrial customers. Time-of-use rates help recover supply costs during peak times and keep rates low for customers when the demand for energy is lower. The rate stabilization adjustment recovers costs for fluctuations in power generation, fuel consumption, environmental mitigation, and other power-related costs.

APU continuously monitors how the cost to provide electric service impacts customer bills over time. As the only publicly owned utility in Orange County, APU compares its rates to the two investor-owned utilities, Southern California Edison and San Diego Gas & Electric. The monthly average residential electric bills for Southern California Edison and San Diego Gas & Electric are \$155.53 and \$237.44, respectively, while APU's monthly average comes out to \$94.60. When looking at the percent of median household income, Southern California Edison and San Diego Gas & Electric is 1.9 percent and 3.1 percent, respectively, while APU's electric bill is 1.4 percent.

APU added a commercial EV rate customer class to encourage adoption of electric transit buses, school buses, delivery vehicles, and other fleet vehicles within its territory. As of March 2020, APU has also been offering a net energy metering rate to align solar customers with the costs of providing electric service.

System and Local Reliability

SB 350 requires filing POU's to adopt an IRP that ensures system and local reliability and addresses resource adequacy requirements.⁸ Staff reviewed the APU 2023 IRP filing capacity reporting table and discussion and finds that APU has planned for sufficient resources to maintain a reliable electric system. In addition, APU's selected portfolio of resources contains sufficient capacity to meet anticipated resource adequacy requirements in 2030. Staff finds this IRP is consistent with the SB 350 reliability requirements in PUC Section 9621(b)(3) and resource adequacy requirements in PUC Section 9621(d)(1)(E).

System Reliability

APU uses a mix of its owned and contracted resources to meet California ISO's system resource adequacy obligations. These resources include both renewable and conventional generation within the State and imported into the State. The Reliability Portfolio requires small capacity purchases between 2027 and 2031 and meets the system capacity requirement with the current California ISO resource adequacy accounting rules from 2023 to 2042.

APU plans to meet electricity demand by following federal, state, and North American Electric Reliability Corporation requirements and standards for reliability and operations. APU plans to meet 1-in-2 peak load conditions, plus a 15 percent planning reserve margin.

Local Capacity Needs

APU resides in the Los Angeles (LA) Basin Local Reliability Area. The results from the *2023 Local Capacity Technical Analysis* issued by the California ISO assigned a Local Capacity Requirement of 192.31 MW for APU within the LA Basin Local Reliability Area. The Local Capacity Requirement for APU has historically been below 230 MW. Currently, APU has 255 MW of natural gas and baseload renewable power plants located in this area, which exceeds California ISO's Local Capacity Requirement under the recommended Reliability Portfolio.

Flexible Capacity Needs

On average, APU has a monthly flexible capacity requirement of 17 MW with a May peak capacity requirement of around 20 MW which is set by the California ISO. Flexible resource requirements include the ability to sustain upward and downward ramps, respond for a defined period of time, change ramping direction quickly, react quickly and meet expected operating levels, start with a short notice from zero or low electric operating level, and start and stop multiple times per day. APU typically utilizes the Canyon Power Plant (CPP) to satisfy the California ISO's procurement target for flexible capacity. CPP is a local resource with the ability to ramp up or down as needed providing 194 MW of eligible flexible capacity. APU has sufficient flexible capacity available through CPP to meet the additional requirements.

⁸ Public Utilities Code section 9621(b)(3).

Transmission and Distribution Systems

PUC Section 9621(b)(3) requires filing POUs to adopt an IRP that achieves the goal of strengthening the diversity, sustainability, and resilience of the bulk transmission and distribution systems and local communities, as further specified in PUC Section 454.52(a)(1)(G). Staff determined that the *APU 2023 IRP* filing adequate plans to maintain and enhance its transmission and distribution systems. Staff finds that APU is planning for enough transmission to adequately deliver resources to its service area to meet the requirement as discussed below. Staff also finds that APU plans 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

APU's transmission resources includes the following:

- Mead-Adelanto Transmission Project: A 202-mile, 500 kilovolt (kV) AC transmission line that runs from the Marketplace Substation near Boulder City, Nevada to the Adelanto Substation near Victorville, California with a transfer capacity of 1,291 MW. APU's share is 159 MW.
- Mead-Phoenix Transmission Project: A 256-mile, 500 kV AC transmission line that extends from the Westwing Substation near Phoenix, Arizona to the Mead Substation near Boulder City, Nevada with a transfer capacity of 1,923 MW. APU's share is 155 MW.
- Norther Transmission System: A 490-mile, 500 kV DC transmission line that extends from IPP near Delta, Utah to the Adelanto Substation in Southern California with a transfer capacity of 2,400 MW. APU's share is 257 MW.
- Southern Transmission System: A 490-mile, 500 kV DC transmission line that extends from IPP near Delta, Utah to the Adelanto Substation in Southern California with a transfer capacity of 2,400 MW. APU's share is 424 MW.
- Adelanto-Victorville/Lugo Transmission System: Approximately 23-mile, 500 kV AC transmission line from Adelanto to Victorville substations and the midpoint of the Lugo/Victorville 500 kV line with a transfer capacity of 2,400 MW. APU's share is 110 MW.

APU's operational control of its transmission resources was transferred to California ISO on October 10, 2006. APU is a Distribution Provider, but not a Transmission Operator, Transmission Owner, Transmission Planner, Transmission Service Provider, Generator Owner, or Generator Operator. As such, the California ISO is responsible for evaluating the regional short-term and long-term infrastructure needs during its annual Transmission Planning Process.

Distribution System

APU's electric system is a carefully planned and robust system. It consists of a 69 kV radial network serving thirteen 69/12 kV distribution substations with a total combined historic peak demand of approximately 600 MW. APU's distribution system includes approximately 120 distribution circuits fed by 14 distribution substations across 50 square miles. APU also has emergency procedures and redundancy built into its system to address the unlikely event of a catastrophic failure of a substation.

APU's system is evaluated on an annual basis to ensure the forecasted peak demand can be met. APU plans to upgrade and reinforce its electrical infrastructures with on-going programs and capital projects to maintain reliability and anticipated load growth in the five-year planning horizon.

Disadvantaged Communities and Localized Air Pollutants

APU is making efforts to prioritize public EV programs for disadvantaged communities, consistent with the statutory requirements of Public Utilities Code Section 454.52 (a)(1)(I). Staff reviewed the *APU 2023 IRP* filing to determine the extent to which it minimizes local air pollutants with a priority placed on disadvantaged communities. APU has rebates through the Public Access and Private Use EV Charging Station Rebate Programs and the Clean Fuel Rewards Program, which have helped many disadvantaged communities in APU's territory.

APU has plans for future programs which will also prioritize disadvantage communities and reducing localized air pollutants. APU is installing city-owned EV charging stations in neighborhoods with high concentrations of multi-unit dwellings, public spaces such as parks, community centers, and police stations, where residents can charge their EV's.

Another program APU plans to implement is called Drive Green Anaheim. This program would provide no-cost EV charger technical consulting services for commercial customers and multi-family property owners located in low-income disadvantaged communities with technical guidance on how to design, plan for, and maintain EV chargers for public and private use. APU also plans to divest in the combustion of fossil fuel fired generation, which will also reduce air pollution in communities neighboring the power plants, including disadvantaged communities.

Net Energy Demand in Peak Hours

SB 338 (Skinner, Chapter 389, Statutes of 2017) 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 (PUC Section 9621(c)). APU's IRP includes a discussion of how it considers preferred resources to meet peak demand when selecting resources for its portfolio and is consistent with the requirement set forth above. Under California ISO, APU is required to procure resources to meet 115 percent of its forecasted peak demand for each month to ensure that more than sufficient resources are available to meet customer loads per the Federal Energy Regulatory Commission approved California ISO tariff.

APU considers peak shifts and will be incorporating battery energy storage to be a hedge to solar and wind generation volatility. This will allow California ISO to store excess energy during the day and use during evening hours as solar generation drops off to augment electrical peak demand reliability on the grid. APU currently is reviewing the design-build proposals received through the Request for Proposals for consideration and evaluation against other battery energy storage proposals for systems within the LA Basin Area.

APU's Reliability Portfolio for 2030 includes the divestiture of coal resources completely and moving towards more adoption of wind and solar resources. Because of the divestment of IPP, APU will require small capacity purchases between 2027 and 2031. For load ramping needs, from 4:00 to 9:00 PM, CPP will provide the flexible capacity resource adequacy needs.

Additional Procurement Goals

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

Energy Efficiency and Demand Response Resources

Staff finds that APU'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 quantifies the amount of energy efficiency savings it plans to achieve.

APU has historically provided EE programs to its customers, even prior to *The Electric Utility Industry Restructuring Act* of 1996. Since the passage of that Act, APU has set aside 2.85 percent of electric retail sales revenues for the implementation of Public Benefit Programs. The funds are allocated to the following four program categories.

- Cost-effective energy efficiency and conservation activities
 1. Programs to advance science or technology that are provided by competitive and regulated markets
 2. In-state operation and development of existing, new, and emerging renewable resource technologies
- Programs and rate discounts for low-income electricity customers

Currently, there are over 45 energy and water efficiency programs to help Anaheim customers reduce their utility bills and operating costs. Over the past five years, (FY 17/18 - FY 21/22), APU reported savings of 80,480,075 kWh and expended \$21.7 million for residential, commercial and income-qualified programs.

APU has facilitated several energy efficiency potential studies to better understand their savings threshold and have included incremental savings targets leading up to 2030. These savings are reported using a methodology that differs from the one used by the CEC to set the POU EE targets in the *Revised SB 350 Doubling Energy Efficiency Savings by 2030* Report.⁹

⁹ CEC. October 2017. [Revised SB 350 Doubling Energy Efficiency Savings by 2030](https://efiling.energy.ca.gov/GetDocument.aspx?tn=224615&DocumentContentId=55172_).
https://efiling.energy.ca.gov/GetDocument.aspx?tn=224615&DocumentContentId=55172_

APU savings are tabulated as incremental gross savings and contain codes and standards. Additionally, they provide the equivalent percent of total retail sales and use the average equivalent percent of retail sales for EE savings targets. The CEC uses cumulative net savings with codes and standards excluded to track SB 350 progression as this is how the targets were originally set. Lastly, APU was not able to provide historical energy efficiency savings for 2015 and 2016 since they did not have the opportunity to, but the data are available online from the Southern California Public Power Authority website.

While making progress toward the EE doubling goal, APU acknowledged the challenges they faced expanding their energy efficiency programs and the impacts toward EE programs brought on by the global COVID 19 pandemic in 2020. The water and efficiency programs were hindered by the decline in residential and business participation due to the statewide emergency quarantine orders. This continues to impact progress in achieving kWh savings targets today. APU originally projected an EE savings goal equal to an average 1 percent of total retail electric sales in 2016 as a report submitted to CEC in 2017 titled *Energy Efficiency in California's Public Power Sector*. As of the latest study titled *CMUA 2020 Energy Efficiency Potential Forecast*, published in 2021, Anaheim projects an average EE savings target 0.49 percent of retail electric sales from 2022 to 2031. This drop in savings can be supplemented by the efficiency gains brought on by building electrification.

APU is in a fully developed city in Orange County, with half of its service area within low-income and disadvantaged communities. The impact of additional achievable fuel substitution may be at a rate that is different from the overall SCE region. With the lack of additional achievable fuel substitution analysis and the minimal impact derived from the CPUC dataset, APU did not include additional achievable fuel substitution in its own demand adjuster in APU's forecast. However, APU plans to expand their forecast analysis to better understand the additional achievable fuel substitution impacts in their service area. APU may then opt into incorporating additional achievable fuel substitution as its own forecast load modifier.

APU provided a roadmap of the roll out of new demand response initiatives in 2023 and 2024. Existing and future programs include estimates of load that can be flexed by certain programs.

APU has demonstrated it is working toward growing its energy efficiency programs and even launching new ones to meet the needs of their customer base. Likewise, APU outlined a pathway for the expansion of demand response initiatives in their service area. Thus, APU has demonstrated, throughout their IRP, they are working to actively incorporate energy efficiency and demand response into their planning process.

Energy Storage

Staff finds that APU'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.

In mid-2022, APU solicited proposals from battery energy storage system (BESS) design-build developers for the design and construction of a 50, 40, or 30 MW BESS project located in

Anaheim, California. The BESS project will likely be operated at the direction of the California ISO to help meet electric load constraints. California ISO will also be able to use the BESS project to provide ramping generation resources during the evening hours as solar generation drops off to augment electrical peak demand reliability. As of the submission of the IRP, the design-build proposals received through were being reviewed for consideration and evaluation against other BESS proposals for systems within the LA Basin Local Reliability Area.

Transportation Electrification

Staff finds that APU's IRP is consistent with the requirements of PUC Section 9621(b)(4) and (d)(1)(C) as it addresses transportation electrification, projecting for light-duty EV growth, and includes details of the utility's rate design, incentives, rebates to encourage transportation electrification, and customer education efforts.

APU has promoted the use of electric transportation both internally and through efforts in the communities it serves. APU anticipates an average annual EV load increase of 17 GWh from 2023 to 2035. This results in a cumulative EV load of 134 GWh in 2030, which is more than double the 2018 IRP forecast of 63 GWh.

APU plans to replace 100 percent of its passenger fleet vehicles with EVs or hybrid EVs by 2024. With conservative assumptions, market saturation, beyond 2036, it is estimated that avoided emissions will be 94,707 MT CO₂e by 2045. As of October 2022, there are 507 level 2 charging stations and 82 DC fast charging stations.

APU has various transportation programs to incentivize the adoption of EVs:

- Employee Workplace Charging Program
- EV time-based rates schedules for residential and commercial customers
- Public EV programs for customers including those in disadvantaged communities
- Future programs planned to further incentivize the adoption of EVs

Portfolio Diversification

PUC Section 9621(d)(1)(D) requires that POUs address the procurement of a diversified portfolio of resources consisting of both short-term and long-term electricity, and demand response products. Staff's review of APU's IRP and APU's standardized tables show that the mix of resources combined with modeling and reliability analyses include a diverse array of zero-emission resources, including geothermal, biofuels, wind, solar, small hydro, and battery storage. The divestment of IPP will help reach the State's climate goal of 100 percent RPS by 2045.

ABBREVIATIONS

Acronym	Term
APU	Anaheim Public Utilities
<i>APU 2023 IRP</i>	<i>Anaheim Public Utilities 2023 Integrated Resource Plan</i>
BESS	Battery Energy Storage System
California ISO	California Independent System Operator
CARB	California Air Resources Board
CEC	California Energy Commission
CPUC	California Public Utilities Commission
CPP	Canyon Power Plant
EE	Energy Efficiency
EV	Electric vehicle
GHG	Greenhouse gas
GWh	Gigawatt-hours
IPP	Intermountain Power Plant
IRP	Integrated resource plan
kV	kilovolt
LA	Los Angeles
MMTCO ₂ e	Million metric tons of carbon dioxide equivalent
MTCO ₂ e	Metric tons of carbon dioxide equivalent
MW	Megawatt
MWh	Megawatt-hour
POU	Publicly owned utility
PUC	Public Utilities Code
RPS	Renewables Portfolio Standard
SB 350	Senate Bill 350 (De León, Chapter 547, Statutes of 2015)

APPENDIX A:

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.
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)	<p>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:</p> <ul style="list-style-type: none"> • Forecasting statewide energy demand. • Licensing of power plants and transmission lines sufficient to meet those needs. • Promoting energy conservation and efficiency measures. • Promoting the development of renewable energy. • Promoting the transition to clean transportation fuels. • Investing in energy innovation. • Planning for and supporting the state's response to energy emergencies. <p>Funding for the Commission's activities comes from the Energy Resources Program Account, Federal Petroleum Violation Escrow Account, and other sources.</p>

Term	Definition
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 (CO ₂), methane (CH ₄), nitrous oxide (N ₂ O), halogenated fluorocarbons (HCFCs), ozone (O ₃), 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.

Term	Definition
Senate Bill 350 (De León, Chapter 547, Statutes of 2015)	Also known as the Clean Energy and Pollution Reduction Act, this bill established clean energy, clean air, and greenhouse gas reduction goals, including reducing greenhouse gas to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050. The California Energy Commission is working with other state agencies to implement the bill.
Standardized Tables	The four tables that are required with the IRP filing submitted to the Energy Commission. These tables include information and data necessary to help staff determine if the IRP is consistent with PUC Section 9621. The four standardized tables are Capacity Resource Accounting Table (CRAT), Energy Balance Table (EBT), Renewable Procurement Table (RPT), and Greenhouse Gas Emissions Accounting Table (GEAT).
Zero-emission resources	An engine, motor, process, or other energy source, that emits no waste products that pollute the environment or disrupt the climate.