



2023 CALIFORNIA RENEWABLES PORTFOLIO STANDARD

Annual Report

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California Public
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Executive Summary

The California Public Utilities Commission (CPUC) reports to the Legislature each year on the progress of the Renewables Portfolio Standard (RPS) program (Senate Bill (SB) 1222¹ (Hertzberg, 2016)). This report describes the progress of the State's electricity retail sellers² in meeting the RPS program requirements for 2022 and future years.

The report also identifies specific challenges to the RPS program and recommendations for addressing those challenges in a later section of this report. Specifically, the report addresses challenges related to bioenergy, renewable energy project development delays, and interconnection demand.

While the status of RPS compliance and enforcement is included, a subsequent annual report will address the 2017-2020 compliance period after the CPUC finishes its compliance review.

Finally, it is important to note that while this report is focused on the RPS program, as directed by statute, the state's integrated resource planning process, through which the CPUC requires new electricity resources to meet reliability and increasingly stringent greenhouse gas (GHG) targets to achieve SB 100 (De León, 2018) goal of 100 percent of retail electricity sales being met with renewable and zero-carbon resources by 2045, will play an increasingly central role in future renewable project development.

1. California's Electricity Retail Sellers are Generally Meeting Annual RPS Targets³

Although RPS compliance determinations are only made for the compliance period as a whole, retail seller performance is also measured against annual targets, though these are non-binding.

- Most of the retail sellers report procuring at or above the 38.5 percent RPS annual target for 2022.⁴
- The large Investor-Owned Utilities (IOUs) have executed enough renewable electricity contracts to exceed the annual 2022 RPS target and are on track to meet the overall 2021-2024 compliance period requirement of 44 percent.
- All of the small and multi-jurisdictional utilities (SMJUs) have executed enough renewable contracts to meet or exceed their 2022 RPS target; however, all must procure additional resources to meet the overall 2021-2024 compliance period requirement.
- Nearly all Community Choice Aggregators (CCAs) have executed enough renewable electricity contracts to meet or exceed the annual 2022 RPS target,⁵ and most are on track to meet the overall RPS requirements for the 2021-2024 compliance period.

¹ As codified in Public Utilities Code § 913.4. See Appendix F for full text of § 913.4.

² See Appendix E for full list of active retail sellers.

³ The CPUC is currently reviewing retail sellers' compliance filings to make final determinations for the 2017-2020 compliance period.

⁴ Based on preliminary 2022 Annual Compliance Report filings submitted to the CPUC in August 2023.

⁵ Based on the most recent Renewable Net Short (RNS) calculations and RPS Compliance Reports. RNS is defined as the amount of additional renewable generation necessary to meet or exceed RPS requirements. The calculations are submitted to the CPUC in the retail sellers' Annual RPS Procurement Plans.

- More than half of Electric Service Providers (ESPs) must execute more renewable electricity contracts to meet the annual 2022 RPS target,⁶ with similar figures for the overall 2021-2024 compliance period.

2. 2022 RPS Prices For New Contracts Increased and Portfolios Show Additional Solar Procurement

- The average RPS eligible energy contract price has dropped an average of 1.3 percent per year from 2007 to 2022. The historic downward contract price decline is expected to continue because lower priced solar photovoltaic (PV) and wind contracts are expected to continue to be a dominant portion of retail sellers’ future executed RPS contracts.
- The average annual RPS contract price increased from 3.0 cents/MWh in 2021 to 6.2 cents/kWh in 2022. The average annual contract price increased in 2022 due to more diversified contracting of renewables in 2022 that featured solar PV, wind, and more expensive technologies such as geothermal. Covid-related supply chain impacts continue to impact equipment supplies and likely also influenced the higher prices along with inflation.
- Of the 5,000 MW of renewables in development contracted by CCAs and ESPs and contracted over the past several years, 85 percent are solar PV facilities.⁷

3. Electric Service Providers (ESPs) Must Increase Renewable Procurement to Meet Long-Term RPS Requirements

- The IOUs, SMJUs, and CCAs are well-positioned to meet the 65 percent long-term procurement requirement for the 2021-2024 compliance period.⁸
- Eight of the eleven ESPs that plan to serve load in the 2021–2024 compliance period and beyond have executed long-term contracts to procure at or above the 65 percent requirement. The three ESPs reporting deficiencies in long-term procurement average 50 percent long-term procurement versus the required 65 percent.

4. RPS Workforces Increased and Retail Sellers Show Various Efforts to Have Diverse Workforces

- The IOUs’ aggregate RPS workforces increased from 172 employees in 2022 to 228 employees in 2023 and the percentage of women and minorities increased from 43 percent to 46 percent and 60 percent to 67 percent, respectively.

⁶ Based on the most recent Renewable Net Short (RNS) calculations and RPS Compliance Reports. RNS is defined as the amount of additional renewable generation necessary to meet or exceed RPS requirements. The calculations are submitted to the CPUC in the retail sellers’ Annual RPS Procurement Plans.

⁷ See Tables 13–15 in Chapter III for a list of projects in development.

⁸ SB 350 established the long-term contracting requirements for the RPS program and applies to all retail sellers beginning in Compliance Period 2021–2024. For more information, see Chapter III.

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- The CCAs' aggregate RPS workforces increased from 183 employees in 2022 to 206 employees in 2023 and the percentage of women and minorities decreased from 54 percent to 50 percent and from 43 percent to 36 percent, respectively.
- For the 8 ESPs that reported out of the 20 total ESPs, the aggregate RPS workforces increased from 67 employees in 2022 to 68 employees in 2023. Of the 68 employees, women and minorities made up 32 percent and 16 percent, respectively.
- IOUs have various recruiting efforts and partnerships with organizations and universities to obtain a diverse workforce.

Background

The California Public Utilities Commission (CPUC) reports to the Legislature each November on the progress of California’s electricity retail sellers in meeting the RPS requirements. This report complies with Public Utilities Code 913.4 sub-sections:

- Progress on RPS procurement activities;
- Details on RPS activities and implementation;
- Projected ability to meet RPS under cost limitations;
- Status of RPS plans, activities, procurement, and transmission;
- Barriers and policy recommendations to achieving the RPS; and
- Efforts of electrical corporations related to workforce development, training, and diversity.

Legislative History

The California RPS program was established in 2002 by Senate Bill (SB) 1078 (Sher, 2002) with the initial requirement that 20 percent of electricity retail sales must be served by renewable resources by 2017. The program was accelerated in 2006 under SB 107 (Simitian, 2006), which required that the 20 percent mandate be met by 2010. In April 2011, SB 2 (1X) (Simitian, 2011) codified achievement of the 33 percent RPS requirement by 2020. In 2015, Governor Brown signed into law SB 350 (de León, 2015), which mandated a 50 percent RPS by December 31, 2030. SB 350 also includes interim annual RPS targets with three-year compliance periods. In addition, SB 350 requires that 65 percent of RPS procurement must be derived from long-term contracts of 10 or more years. In 2018, SB 100 (de León, 2018) accelerated and increased the RPS to 60 percent by 2030 and established a goal for 100 percent of retail electricity sales being met with renewable and zero carbon resources by 2045.

California’s RPS Program

California’s ambitious RPS program is jointly implemented by the CPUC and the California Energy Commission (CEC). The RPS program requires the State’s retail sellers⁹ to procure 60 percent of their total electricity retail sales from renewable energy resources by 2030. Increasing the amount of renewables in the State’s energy mix provides a range of benefits to Californians, such as reducing greenhouse gas emissions and air pollution, stabilizing electricity rates, and contributing to the reliable operation of the electrical grid. All California electricity retail sellers, or entities engaged in the sale of electricity to end-use customers, are required to comply with the requirements of the RPS program.¹⁰ Entities under the CPUC’s jurisdiction serve approximately 73 percent of the total electricity demand in California. The Publicly Owned Utilities (POUs) serve the remaining 27 percent.¹¹ Of these retail sellers within the CPUC’s jurisdiction, the large IOUs served approximately 41 percent of the total electricity load in 2022, while SMJUs served 13 percent, CCAs served 31 percent, and ESPs served the remaining 15 percent.

⁹ Retail sellers: large investor-owned utilities (IOUs), small and multi-jurisdictional utilities (SMJUs), community choice aggregators (CCAs), electric service providers (ESPs), and publicly owned utilities (POUs). See Appendix C for a complete list of active retail sellers that the CPUC regulates.

¹⁰ See Chapter IV: Compliance & Enforcement for more details on RPS program requirements.

¹¹ POUs report their RPS compliance to the CEC and their information is not included in this report.

RPS Progress and Status

This chapter uses historical annual data through December 31, 2022, to illustrate the state of the RPS program. The data was obtained from the 2023 Draft RPS Procurement Plans¹² and the 2022 RPS Compliance Reports¹³ of all retail sellers, including the large investor-owned utilities (IOUs), small and multi-jurisdictional utilities (SMJUs), community choice aggregators (CCAs), and electric service providers (ESPs). Although this Annual Report provides an update on the retail sellers' progress toward meeting RPS requirements for 2022, which is within the 2021-2024 compliance period, and at times highlights retail sellers' progress toward annual RPS procurement targets and RPS procurement requirements for the entire compliance period, it does not include any reporting of compliance determinations for this current compliance period. Final compliance determinations are made after the CEC verifies retail sellers' renewable energy credits (RECs) and the CPUC finishes its compliance review. Greater detail regarding the compliance process is provided in this report's Compliance and Enforcement section and Appendix B.

Current Renewable Portfolios

All electricity retail sellers had an annual target to serve at least 38.5 percent of their electric load with RPS-eligible resources by December 31, 2022.¹⁴ In general, most retail sellers reported either meeting or exceeding the 38.5 percent interim RPS target.¹⁵ Additionally, almost all reported meeting their 2017–2020 compliance period requirements of 33 percent.¹⁶ Figure 1 below shows statewide progress towards meeting the 2030 60 percent RPS requirements.¹⁷

¹² Each year, retail sellers are required to submit their RPS Procurement Plans to the CPUC for approval. Draft 2023 RPS Procurement Plans were submitted in July 2023.

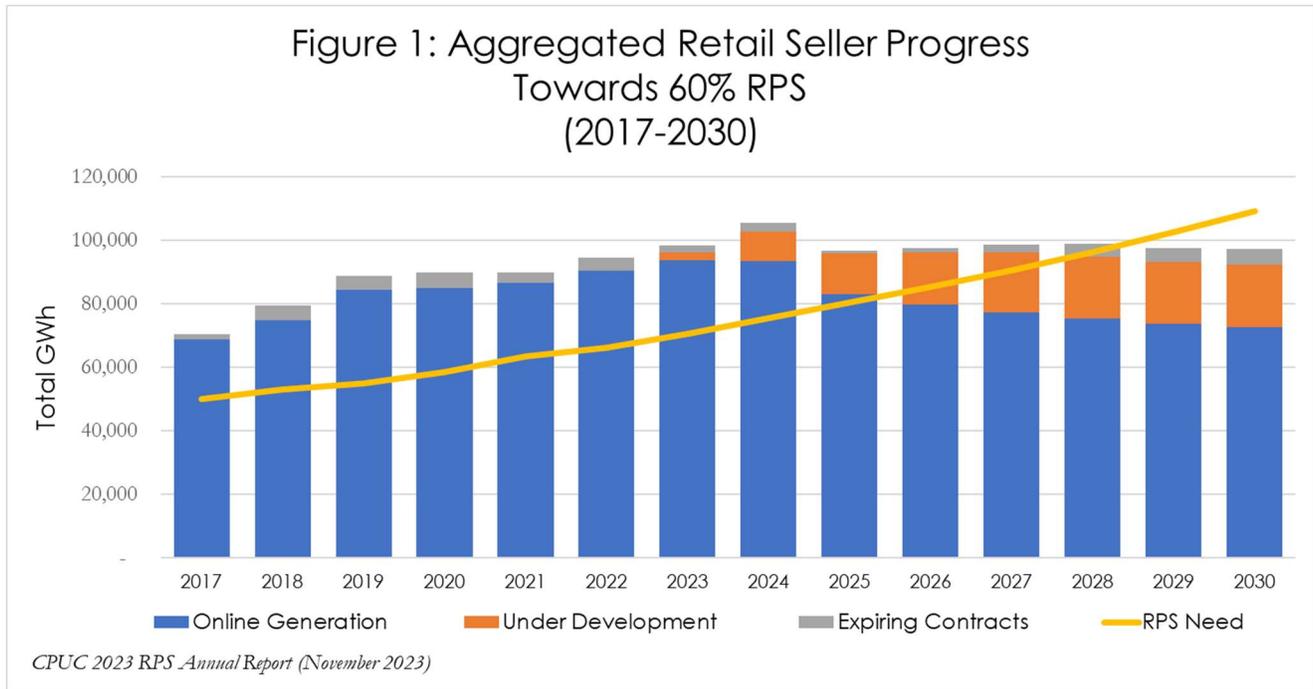
¹³ Retail sellers are required to submit preliminary RPS Compliance Reports each year on August 1 to demonstrate progress towards meeting their RPS requirements.

¹⁴ D.19-06-023

¹⁵ Compliance with California's RPS program is determined by multi-year compliance periods.

¹⁶ See Chapter IV: Compliance and Enforcement, Annual Compliance Review for more information.

¹⁷ See the 2014 Administrative Law Judge Ruling on Renewable Net Short for full definitions of Online Generation, Under Development, and Expiring Contracts: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M091/K331/91331194.PDF>



Data Source: All Retail Sellers’ 2023 Draft RPS Procurement Plans

Large Investor-Owned Utilities (IOUs)

The large IOUs serving electric load in California are Pacific Gas and Electric Company (PG&E), Southern California Edison Company (SCE), and San Diego Gas & Electric Company (SDG&E). PG&E’s service territory spans from Santa Barbara to Shasta Counties, SCE’s territory spans from Riverside to Mono Counties, and SDG&E serves San Diego County and southern Orange County.¹⁸ The three large IOUs are on track to meet their 60 percent 2030 RPS procurement mandate. The IOUs have procured and contracted to be on track to either meet or surpass the 2023 annual RPS percentage target of 41.3 percent, as illustrated in Table 1.¹⁹

Utility	RPS Procurement Percentage
Pacific Gas and Electric	47%
Southern California Edison	36%
San Diego Gas & Electric	59%

Data Source: IOUs’ 2023 Draft RPS Procurement Plans (July 2023)

The three large IOUs are forecasted to keep surpassing RPS requirements as they are collectively forecasted to have excess procurement for the next three years.²⁰ However, this forecast may change with

¹⁸ For more information on California electric utility service areas, see the CEC’s California Energy Maps website: <https://cegis-caenergy.opendata.arcgis.com/documents/electric-utility-service-territories-and-balancing-authorities/explore>

¹⁹ Based on their annual Draft 2023 RPS Procurement Plans, as well as Compliance Reports filed with the CPUC in 2023.

²⁰ The IOUs’ excess procurement is based on the current forecast of bundled electricity load and the amount of RPS resources already under contract.

portfolio optimization efforts, particularly as the Voluntary Allocation and Market Offer (VAMO)²¹ process is completed (as discussed later in this report), increasing transportation electrification, and procurement to meet other requirements such as those added by SB 1020 (Laird, 2022). The IOUs may choose to optimize by applying excess renewable electricity procured in prior, current, and future years to meet their RPS requirements in future compliance periods. Alternatively, they may sell the future excess renewable electricity and associated renewable energy credits (RECs)²² to other retail sellers, such as CCAs or ESPs, publicly-owned utilities, or provide higher than required amounts of renewable energy to their customers.

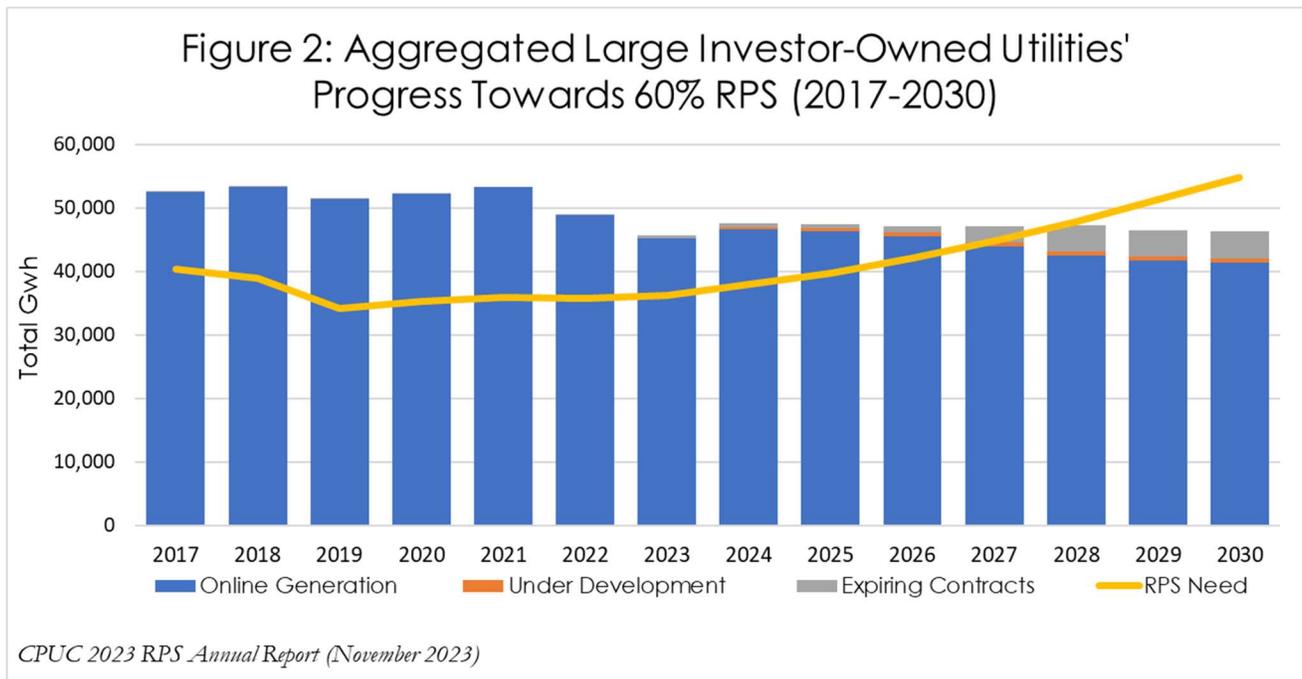
A variety of market factors have contributed to the IOUs being procured beyond their minimum RPS requirements. These market factors include the initial need to hedge against early program experience with project failure, the continued trend of load departing from IOUs, and the increase in behind-the-meter solar generation, which has reduced the amount of retail sales relative to forecast sales.

Figure 2 below uses the most current annual data to illustrate the actual and forecasted progress the IOUs have made toward meeting the 60 percent RPS mandate by 2030. Generation forecasts from projects “Under Development” are risk-adjusted to account for a certain degree of project failure.²³ The “Expiring Contracts” data represent the amount of generation associated with facilities that will no longer have a Power Purchase Agreement (PPA) with one of the IOUs. Although this generation will not be under contract, there is a possibility that these facilities will re-contract with their current counterparty or another retail seller in the future.

²¹ On May 24, 2021, the CPUC issued Decision (D.) 21-05-030 to authorize new Voluntary Allocation, Market Offer, and Request for Information processes for large IOU RPS contracts subject to the Power Charge Indifference Adjustment (PCIA). The Decision adopted a Voluntary Allocation and Market Offer (VAMO) mechanism, which authorizes a process for PG&E, SCE, and SDG&E to allocate a “slice” of their entire PCIA-eligible RPS portfolios to eligible retail sellers (such as CCAs, ESPs, and the IOUs themselves) in proportion to their vintaged, forecasted annual load share.

²² See Appendix B: Glossary and Terms for the full definition of a renewable energy credit (REC).

²³ Failure rate assumptions are provided by the IOUs in their renewable net short calculation provided with their Draft Annual RPS Procurement Plans.



Data Source: IOUs' 2023 Draft RPS Procurement Plans (July 2023), Renewable Net Short Calculations

The IOUs forecast that they will exceed their RPS requirements by using online generation from existing contracts with a physical deficit beginning in 2028. However, these forecasts may change after the VAMO process is completed, as discussed later in this report. As Figure 2 shows, the IOUs will have a forecasted surplus of renewable generation through 2027 (otherwise known as excess procurement), which may be used to fulfill RPS obligations in subsequent compliance periods or be sold to other retail sellers.²⁴ Given that the IOUs have significant excess eligible RPS procurement to apply in later years, they did not conduct annual RPS procurement solicitations in 2016, 2017, 2018, 2019, 2020, and 2021. While SCE was approved to conduct an RPS solicitation in 2022 it did not. Additionally, the IOUs were approved to procure RPS resources via integrated resource plan (IRP) solicitations in 2022. The CPUC also approved all three IOUs' 2022 RPS Procurement Plans to conduct both procurement and sales solicitations in 2023 and procurement from RPS-eligible resources via IRP mid-term reliability solicitations.²⁵

Table 2 includes aggregate data²⁶ to demonstrate the IOUs' actual procurement and forecasted RPS procurement percentages. The data show that the IOUs expect to exceed their 2023 RPS compliance target and will have procured approximately 51 percent RPS by the end of 2023. The data show that by the end of 2024, the IOUs will still exceed the State mandates. The forecasted RPS percentages of the

²⁴ The calculations for excess procurement rely on a combination of the REC classification and whether the RECs are associated with a short-term or long-term contract. For excess procurement rules for Compliance Periods prior to 2021, see D.12-06-038 and D.17-06-026. For excess procurement rules for Compliance Period 2021–2024 and beyond, see D.17-06-026.

²⁵ The CPUC must approve solicitations outlined in an IOU's annual RPS Procurement Plan in a Decision. D.22-12-030 approved retail sellers' 2022 RPS Procurement Plans.

²⁶ Each retail seller must file its RPS Procurement Plan and Compliance Report annually. Renewable procurement data is not automatically confidential but may be claimed as such through a formal filing. In the formal confidentiality filing, the retail seller must justify why the information should be treated as confidential by the CPUC. Generally, historical data should be public. For contracts requiring CPUC approval, RPS procurement price and contract terms become public 30 days after commercial operation date / energy delivery start date or 18 months from the date of CPUC approval, whichever comes first. For contracts that do not require CPUC approval, contract price and contract terms shall be public 30 days after the commercial operation date/energy delivery start date or eighteen months after the contract execution date, whichever comes first. See the CPUC's Decision on Confidentiality (D.21-11-029) for more information:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M424/K520/424520189.PDF>

aggregated large IOUs decreases from 52 percent in 2022 to 51 percent in 2023. This large amount of forecasted procurement above the RPS requirements is primarily driven by load migration to CCAs in the IOUs' territories but has been mitigated by REC sales.

Table 2: Aggregated Actual and Forecasted Large Investor-Owned Utilities' RPS Percentages for Pacific Gas and Electric, Southern California Edison, and San Diego Gas & Electric

Compliance Period 2017–2020				Compliance Period 2021–2024			
33% Requirement				44% Requirement			
2017	2018	2019	2020	2021	2022	2023	2024
35%	40%	46%	49%	53%	52%	51%	54%

Data Source: IOUs' 2023 Draft RPS Procurement Plans (July 2023), Renewable Net Short Calculations

Small and Multi-Jurisdictional Utilities (SMJUs)

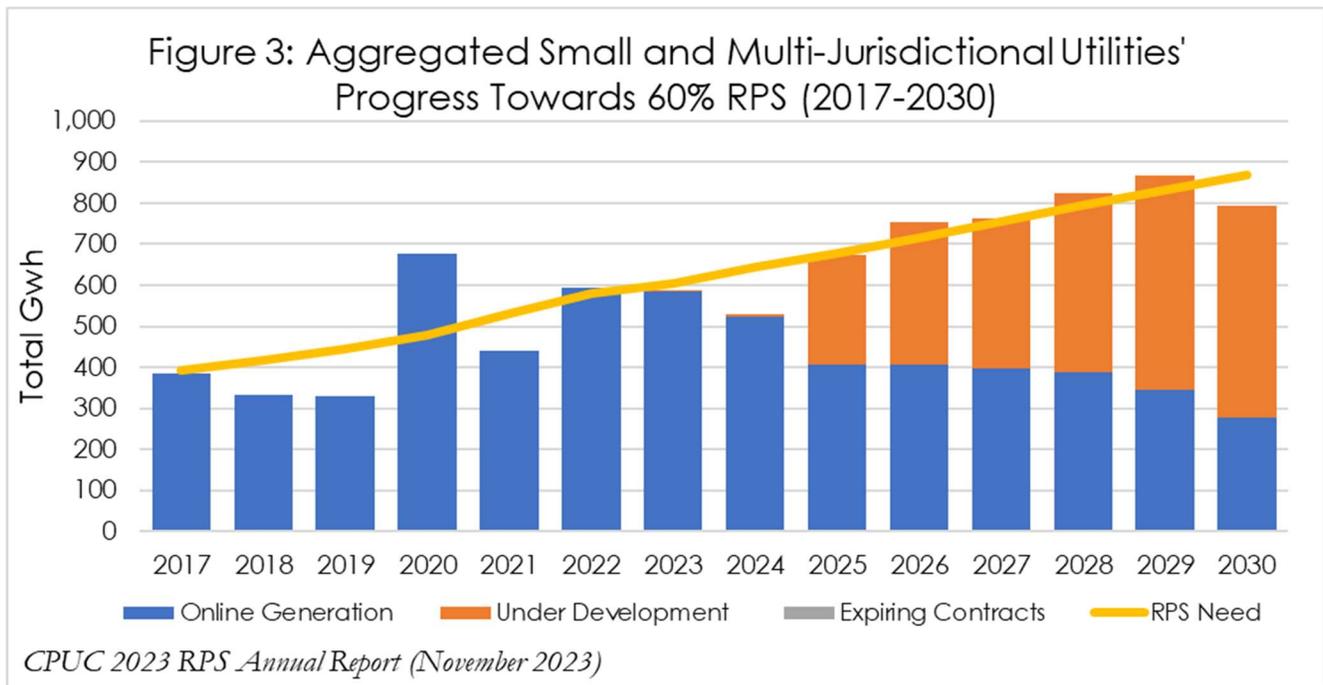
The SMJUs²⁷ serving electric load in California are Bear Valley Electric Service, Inc. (BVES), Liberty Utilities, LLC²⁸ (Liberty), and PacifiCorp.²⁹ BVES provides electricity service to the Big Bear Valley in the San Bernardino Mountains and Liberty serves areas located in and around the Lake Tahoe Basin. PacifiCorp is a multi-jurisdictional utility that provides service in several states and to four Northern California counties: Del Norte, Modoc, Siskiyou, and Shasta.

As illustrated in Figure 3, the aggregate SMJU data indicates that the SMJUs will collectively need to procure additional resources to meet the 2021–2024 Compliance Period requirements. Figure 3 also shows that the SMJUs in aggregate will meet the annual interim target of 38.5 percent for 2022 but that they will be short of the 2023 annual RPS interim target of 41.25 percent. As noted earlier, statutory RPS requirements utilize multi-year compliance periods, so this does not mean that any SMJUs will ultimately be out of compliance for the 2021-2024 compliance period – in fact, the SMJUs have historically met their requirements towards the end of the compliance period. Also, SMJUs' RPS procurements do not need to meet the Portfolio Balance Requirement rules, and they may procure unlimited unbundled REC contracts which tend to be from existing facilities and have quicker transaction times. For example, Figure 3 shows how SMJUs renewables generation increased significantly in 2020 likely to meet their requirements for the 2017-2020 compliance period. SMJUs are currently showing a similar need in the next compliance period, as illustrated in Table 3.

²⁷ SMJUs are also investor-owned utilities but are considered either small or multijurisdictional and have different rules per Public Utilities Code §§ 399.17 and 399.18.

²⁸ Formerly CalPeco Electric.

²⁹ d/b/a Pacific Power



Data Source: SMJUs' 2023 Draft RPS Procurement Plans (July 2023), Renewable Net Short Calculations

Table 3 shows aggregate SMJU data for their actual and forecasted RPS procurement percentages.³⁰

Table 3: Aggregated Actual and Forecasted Small and Multi-Jurisdictional Utilities' RPS Percentages for Bear Valley Electric Service, Liberty Utilities, and PacifiCorp								
	Compliance Period 2017–2020				Compliance Period 2021–2024			
	33% Requirement				44% Requirement			
	2017	2018	2019	2020	2021	2022	2023	2024
	26%	23%	23%	47%	30%	39%	41%	37%

Data Source: SMJUs' 2023 Draft RPS Procurement Plans (July 2023), Renewable Net Short Calculations

Community Choice Aggregators (CCAs)

CCAs are local government entities that are certified by the CPUC to procure electricity on behalf of their communities instead of being served by the IOUs.³¹ All but five of the operating CCAs procured at or above the 2021 annual RPS targets, as shown in Table 5.

³⁰ The CPUC has aggregated RPS procurement data for confidentiality purposes, as reporting individual percentages would disclose market sensitive information.

³¹ AB 117 (Migden, 2002) allows local governments to form Joint Powers Authorities to establish community choice energy programs.

The CCAs play an increasingly significant role in meeting the State’s electric reliability, renewable energy, and greenhouse gas reduction goals. In 2022, 25 CCAs³² operated in California and collectively served 31 percent of the total electric load within CPUC’s jurisdiction.³³

Table 4 uses aggregated CCA data to show actual and forecasted RPS procurement percentages in the current and next compliance period.³⁴

Table 4: Aggregated Actual and Forecasted Community Choice Aggregators’ RPS Percentages								
Compliance Period 2017–2020					Compliance Period 2021–2024			
33% Requirement					44% Requirement			
2017	2018	2019	2020	2021	2022	2023	2024	
54%	51%	54%	50%	49%	55%	59%	57%	

Data Source: CCAs’ 2023 RPS Draft Procurement Plans (July 2023), Renewable Net Short Calculations

As is the case with all CPUC-jurisdictional retail sellers, CCAs submit annual compliance filings to the CPUC demonstrating their progress toward annual RPS procurement targets. While these forecasts are not determinative of their compliance status, they offer insight into retail sellers’ ability to meet RPS requirements. Annual RPS Compliance Reports indicate that most CCAs will need to procure additional renewable resources to meet the 60 percent RPS target by 2030.³⁵

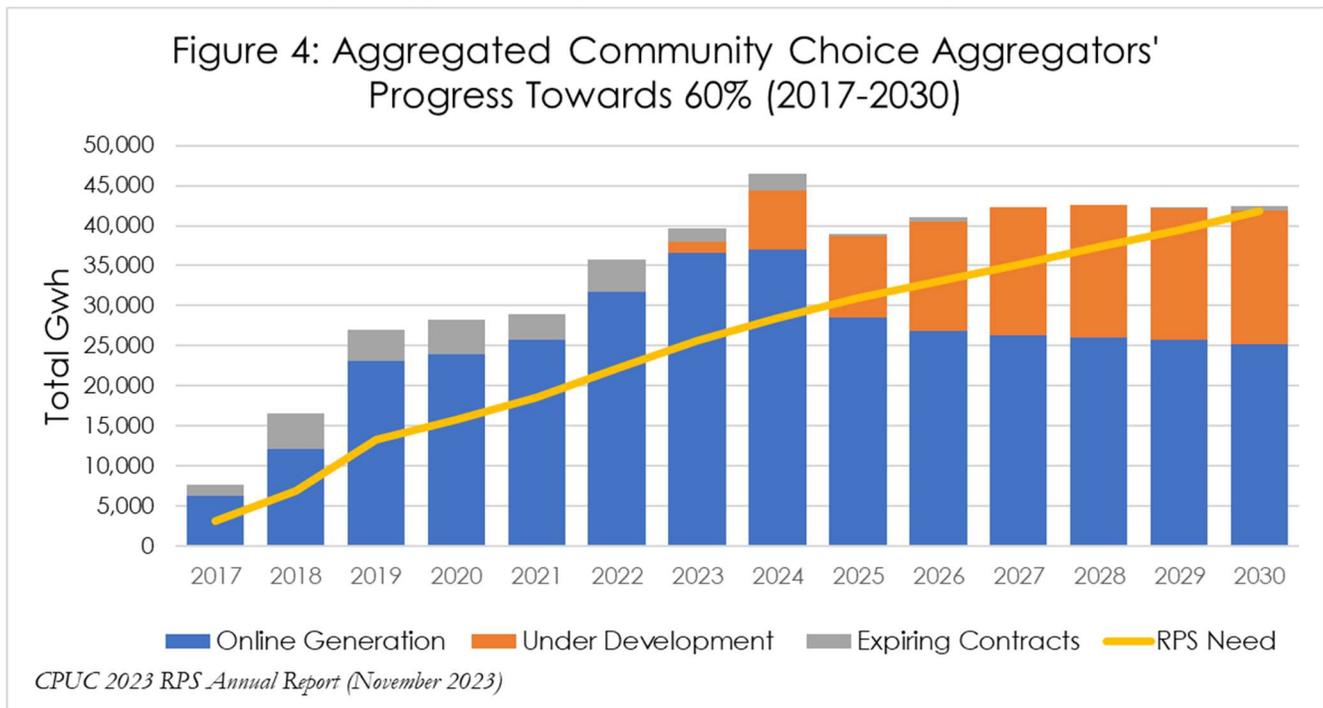
Figure 4 illustrates the actual and forecasted progress the CCAs have made toward meeting the RPS requirements in aggregate. Throughout the 2017-2020 Compliance Period, the CCAs’ procurement has been fairly steady and is forecasted to exceed RPS targets during the remainder of the 2021-2024 Compliance Period. This increase trend continued with procurement increasing six percent in 2022, primarily because of several new CCAs coming online. In aggregate, the CCAs are contracted to exceed their forecasted 2023 and 2024 targets.

³² In 2014, only Marin Clean Energy and Sonoma Clean Power were serving customers, and Lancaster Choice started serving load in 2015. In 2016, Peninsula Clean Energy and CleanPowerSF began service, and in 2017, Apple Valley, Pico Rivera, Redwood Coast and Silicon Valley started service. Ten additional CCAs launched in 2018, including Clean Power Alliance, East Bay Community Energy, King City Community Power, Central Coast Community Energy, Pioneer Community Energy, Rancho Mirage, San Jacinto Power, San José Clean Energy, Solana Energy Alliance, and Valley Clean Energy Alliance. There were no new CCAs that launched in 2019. In 2020, City of Baldwin Park, City of Pomona, Desert Community Energy and Western Community Energy launched as CCAs. In 2021, Clean Energy Alliance and San Diego Community Power began operating. In 2022, one new CCA began operating: Santa Barbara Clean Energy. However, Solana Energy Alliance, City of Baldwin Park, and Western Community Energy deregistered as CCAs and are no longer serving load.

³³ Retail Sellers’ Annual RPS Compliance Reports, August 2023.

³⁴ The aggregated RPS compliance percentages are adjusted for CCA launch years and include data from all 25 registered CCAs.

³⁵ See Table 5 for a breakdown of RPS position by each individual operating CCA.



Data Source: CCAs’ 2023 Draft RPS Procurement Plans (July 2023), Renewable Net Short Calculations

In 2022, the operational CCAs served a total of approximately 62,000 GWh of load³⁶ and had an aggregated RPS position of 55 percent. The CCAs’ generation has increased to keep pace with RPS requirements through 2024, even exceeding the 2024 forecasted target. In 2024, the quantity of projects under development quadruples from the quantity under development in 2023. In 2024, however, online generation begins to decline as 12 of the 25 CCAs forecast an increase in renewable generation while 10 of the CCAs forecast a decrease. The CCAs’ forecasted renewable generation relies heavily on projects that remain under development and must come online. Table 5 below shows the actual positions of individual CCAs that were operational in 2022 and their forecasted positions for 2023 and 2024.

³⁶ Calculated from CEC Integrated Energy Policy Report (IEPR) and CEC 2020 Demand Forecast - Mid Demand / Mid AEE Case

Table 5: Annual RPS Position of Community Choice Aggregators (%)					
First Year Serving Load	CCA	Actuals		Forecast	
		2021	2022	2023	2024
2010	Marin Clean Energy	62%	62%	71%	70%
2014	Sonoma Clean Power	51%	53%	53%	53%
2015	Lancaster Choice Energy	33%	39%	45%	41%
2016	Peninsula Clean Energy	50%	51%	61%	73%
2016	CleanPowerSF	58%	63%	-	-
2017	Apple Valley Choice	40%	30%	51%	49%
2017	Pico Rivera	53%	50%	49%	48%
2017	Redwood Coast Energy Authority	34%	50%	27%	55%
2017	Silicon Valley Clean Energy	51%	53%	-	-
2018	Valley Clean Energy Alliance	13%	18%	31%	73%
2018	Central Coast Community Energy	39%	37%	-	-
2018	San Jacinto Power	36%	37%	53%	53%
2018	Rancho Mirage Energy Authority	40%	39%	50%	47%
2018	Clean Power Alliance	47%	53%	-	-
2018	East Bay Community Energy	42%	60%	-	-
2018	Pioneer Community Energy	36%	48%	40%	44%
2018	San José Clean Energy	58%	60%	56%	61%
2018	King City Community Power	40%	39%	34%	35%
2020	City of Pomona	36%	39%	45%	41%
2020	Desert Community Energy	33%	20%	42%	42%
2021	Clean Energy Alliance	52%	60%	50%	36%
2021	San Diego Community Power	58%	58%	-	-
2021	Santa Barbara Clean Energy	89%	42%	36%	39%
2022	City of Palmdale	0%	39%	33%	27%
2022	Orange County Power Authority	0%	103%	86%	77%

Data Source: CCA Draft RPS Procurement Plans (July 2023), CCA RPS Compliance Reports (August 2023). Forecast amounts of “-” indicate redacted information because these CCAs requested confidential treatment of their forecasted RPS position per CPUC D.06-06-066, as modified.

Electric Service Providers (ESPs)

ESPs serve customers in the Direct Access (DA) program.³⁷ ESPs currently serve approximately 15 percent or 29,000 GWh of electricity load within the CPUC’s jurisdiction.³⁸

Table 6 provides aggregate actual and forecasted RPS procurement percentages of ESPs. Table 6 indicates that ESPs in aggregate met the 2022 annual RPS interim target of 38.5 percent, although many of the ESPs will need to procure additional RPS energy to meet the RPS Compliance Period 2021–2024 requirements.

Table 6: Aggregate Actual and Forecasted Electric Service Providers’ RPS Percentages								
Compliance Period 2017–2020					Compliance Period 2021–2024			
33% Requirement					44% Requirement			
2017	2018	2019	2020	2021	2022	2023	2024	
42%	40%	43%	39%	30%	47%	60%	49%	

Data Source: ESPs’ 2023 Draft RPS Procurement Plans (July 2023)

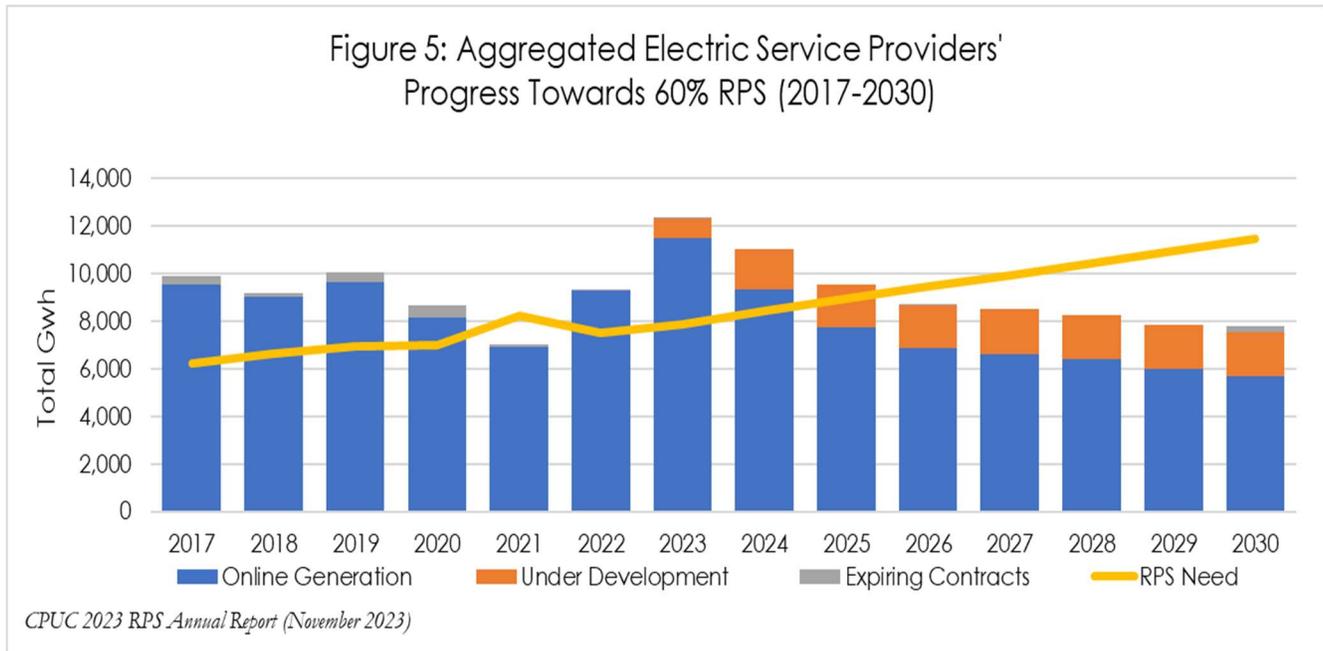
Though ESPs are required to file both RPS Compliance Reports and Procurement Plans, some do not provide detailed long-term forecasts on their renewable procurement. The ESPs’ forecasted procurement percentages are lower into the future because a substantial amount of the ESPs’ RPS procurements are short-term contracts, but long-term contracts are increasing with the 65 percent long-term requirement that started in Compliance Period 2021-2024.

As illustrated in Figure 5, the aggregated ESP data indicates that ESPs will meet the RPS requirements in Compliance Period 2021–2024. The ESPs will collectively need to procure additional resources to meet the RPS requirements in Compliance Period 2025-2028 and beyond.

³⁷ Direct Access (DA) service is retail electric service where customers have the choice to purchase electricity from an ESP, instead of from a regulated electric utility. For more information on DA, visit <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/electric-service-provider-list-and-registration-information>.

³⁸ See Appendix C for a list of active ESPs.

Figure 5: Aggregated Electric Service Providers' Progress Towards 60% RPS (2017-2030)



Data Source: ESPs' 2023 Draft RPS Procurement Plans (July 2023), Renewable Net Short Calculations

Renewable Technology Mix

Resource diversity can contribute to achieving a balanced and reliable energy generation portfolio.³⁹ Since the inception of the RPS program in 2002, the renewable technology mix of the State's energy portfolio has become increasingly diversified. A robust mix of renewable technologies will aid in the transition to a zero-carbon electricity portfolio by 2045 which is crucial for meeting the State's climate and emissions reduction goals.

Large Investor-Owned Utilities (IOUs)

As shown below in Table 7, the IOUs have procured a diverse mix of renewable energy resources including wind, solar thermal, solar photovoltaic (PV), geothermal, bioenergy, and small hydroelectric facilities to meet the requirements of the RPS program.⁴⁰ In 2022, the majority of the IOUs' RPS portfolios were comprised of solar and wind technologies.

³⁹ See Public Utilities Code § 399.11(b) for a list of the benefits the RPS program is intended to provide to California, among which is renewable resource diversity.

⁴⁰ The technology category of "Bioenergy" consists of biomass, biogas, biodiesel, landfill gas, and municipal solid waste.

Table 7: Portfolio Percentages of 2022 RPS Mix for Large IOUs

	Bioenergy	Geothermal	Small Hydro ⁴¹	Conduit Hydro ⁴²	Solar PV	Solar Thermal	Wind
PG&E	9%	1%	4%	-	43%	8%	34%
SCE	<1%	16%	2%	<0.1%	44%	1%	37%
SDG&E	2%	-	-	<0.1%	43%	-	55%

Data Source: IOUs' Annual RPS Compliance Reports (August 2023)

Small and Multi-Jurisdictional Utilities (SMJUs)

In 2022, the SMJUs collectively procured a wide variety of resources, though the mix varied widely by Retail Seller. As Table 8 below shows, in 2022, BVES procured RECs solely from wind resources, whereas Liberty procured primarily from solar PV facilities, though the remaining sources were varied. PacifiCorp had the most diverse renewable energy portfolio mix with six different technologies in its portfolio,⁴³ with most of its renewables being wind and bioenergy.

Table 8: Portfolio Percentages of 2022 RPS Mix for SMJUs

	Bioenergy	Geothermal	Small Hydro	Conduit Hydro	Solar PV	Wind
Bear Valley Electric Service	-	-	-	-	-	100%
Liberty Utilities	3%	10%	23%	-	64%	1%
PacifiCorp	41%	1%	2%	<0.1%	15%	40%

Data Source: SMJUs' Annual RPS Compliance Reports (August 2023)

Community Choice Aggregators (CCAs)

In 2022, the majority of the CCAs' RPS portfolios were comprised of wind and solar resources, but many also included significant amounts of bioenergy, geothermal, and to a lesser degree small hydroelectric resources. Table 9 illustrates the renewable energy portfolio mixes of the CCAs that operated in California in 2022.

⁴¹ Small Hydro projects are defined as hydroelectric facilities that are under 30 MW in capacity by the CEC's RPS Eligibility Guidebook.

⁴² Conduit Hydro facilities use the hydroelectric potential of an existing man-made conduit that is operated to distribute water and must have a facility capacity of 30 MW or less to be considered RPS-eligible.

⁴³ PacifiCorp's California RPS portfolio refers to the portfolio of resources PacifiCorp uses to meet compliance with California's RPS program and does not refer to all resources in its portfolio.

Table 9: Portfolio Percentages 2022 RPS Mix for CCAs

	Bioenergy	Geothermal	Small Hydro	Solar PV	Solar Thermal	Wind
Apple Valley Choice Energy	22%	10%	-	12%	-	56%
Central Coast Community Energy	4%	33%	-	35%	-	28%
Clean Energy Alliance	-	-	3%	48%	-	49%
Clean Power Alliance	7%	11%	1%	44%	-	37%
City of Baldwin Park	-	-	-	-	-	100%
City of Palmdale	-	-	-	15%	-	85%
City of Pomona	22%	-	-	16%	-	62%
City of Santa Barbara	-	-	26%	27%	-	47%
CleanPowerSF	-	36%	-	43%	-	21%
Desert Community Energy	-	-	12%	35%	-	53%
East Bay Community Energy	2%	1%	2%	40%	-	56%
King City Community Energy	<1%	-	-	63%	-	37%
Lancaster Choice Energy	17%	-	-	39%	-	44%
Marin Clean Energy	9%	8%	6%	45%	2%	30%
Orange County Power Authority	5%	13%	5%	51%	-	26%
Peninsula Clean Energy	15%	9%	2%	37%	-	38%
Pioneer Community Energy	8%	13%	5%	24%	-	50%
Pico Rivera Innovative Municipal Energy	32%	3%	-	10%	-	55%
Redwood Coast Energy Authority	40%	-	3%	43%	-	14%
Rancho Mirage Energy Authority	18%	3%	<1%	22%	-	57%
San Jacinto Power	22%	-	6%	31%	-	41%
San José Clean Energy	4%	-	3%	47%	2%	44%
Silicon Valley Clean Energy	3%	54%	1%	33%	-	9%
Sonoma Clean Power	30%	38%	1%	17%	-	14%
Valley Clean Energy Alliance	-	-	-	100%	-	-

Data Source: CCAs' Annual RPS Compliance Reports (August 2023)

As Table 9 shows, CCAs vary widely in resource mix, with some showing diverse RPS portfolios (e.g., Peninsula Clean Energy), but others are less diverse (e.g., Valley Clean Energy Alliance).

Electric Service Providers (ESPs)

Table 10 illustrates the renewable energy portfolio mixes of the ESPs that operated in California in 2022.

Table 10: Portfolio Percentages 2022 RPS Mix for ESPs

	Bioenergy	Geothermal	Small Hydro	Solar PV	Solar Thermal	Wind
3 Phases Renewables	10%	0%	2%	88%	-	0%
BP Energy Retail	-	-	-	89%	-	11%
Calpine Energy Solutions	9%	9%	1%	50%	-	32%
Calpine Power America	-	26%	-	59%	-	15%
Commercial Energy of CA	-	-	<1%	96%	-	4%
Constellation New Energy	3%	-	-	62%	-	35%
Direct Energy Business	7%	-	<1%	66%	-	26%
Pilot Power Group	2%	34%	1%	13%	-	50%
Shell Energy North America	3%	1%	1%	40%	-	55%
UC Regents	-	-	-	84%	-	16%

Data Source: ESPs' Annual RPS Compliance Reports (August 2023)

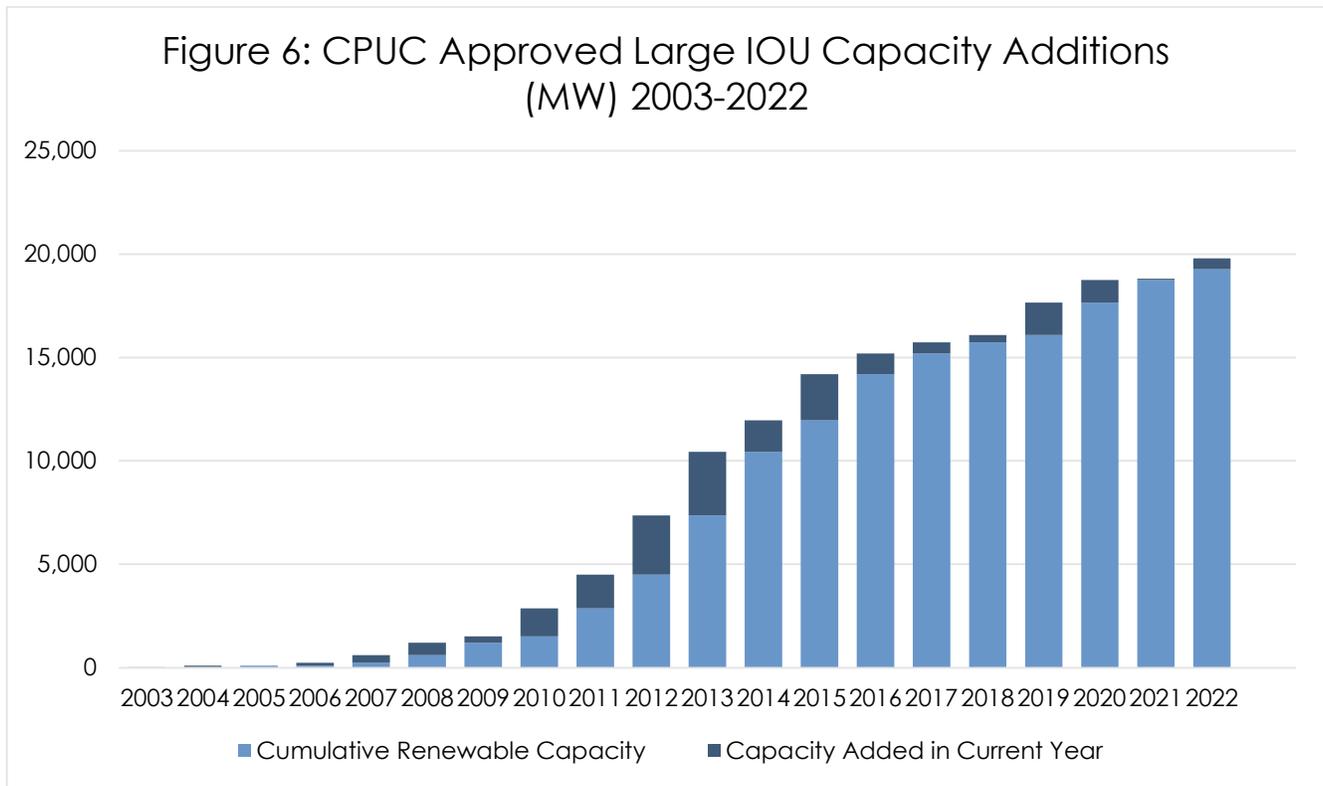
As Table 10 shows, certain ESPs such as 3 Phases Renewables, Calpine Energy Solutions, Direct Energy Business, Pilot Power Group, and Shell Energy North America have diverse RPS portfolios. These portfolios are comprised of a variety of renewable technologies including bioenergy, geothermal, hydroelectric, solar, and wind.

Contracted Renewable Capacity

Since 2003, the three large IOUs have contracted for over 19,250 MW of renewable capacity⁴⁴ under the RPS program. The CPUC must approve all new RPS capacity additions proposed by the large IOUs and SMJUs but is not required to approve capacity additions for CCAs and ESPs. Accordingly, the data collected by the CPUC on approved capacity is primarily for the large IOUs.

The approved RPS capacity shown in Figure 6 includes both in-state and out-of-state facilities that have contracted with the IOUs and have come online between 2003 and 2022. Most of the new facilities procured for the RPS program are located in-state. Approximately 246 additional MW of renewables contracted by the IOUs are scheduled to come online in 2023.

⁴⁴ Renewable capacity is defined as the maximum power generating capacity of power plants that use renewable energy sources to produce electricity.



Data Source: CPUC RPS Database, September 2023

RPS Procurement Costs

To understand the impact that RPS procurement costs will have on ratepayers, the CPUC collects various pricing data to evaluate cost trends and analyzes rate impacts. The IOUs use competitive procurement mechanisms and a Least-Cost Best-Fit evaluation methodology⁴⁵ to ensure procurement of renewable resources that provide the most value to their customers. Although the CPUC has not established cost limitations for RPS procurement, it uses the Integrated Resource Planning⁴⁶ (IRP) proceeding to identify the most cost-effective portfolio of resources to inform future procurement activities.

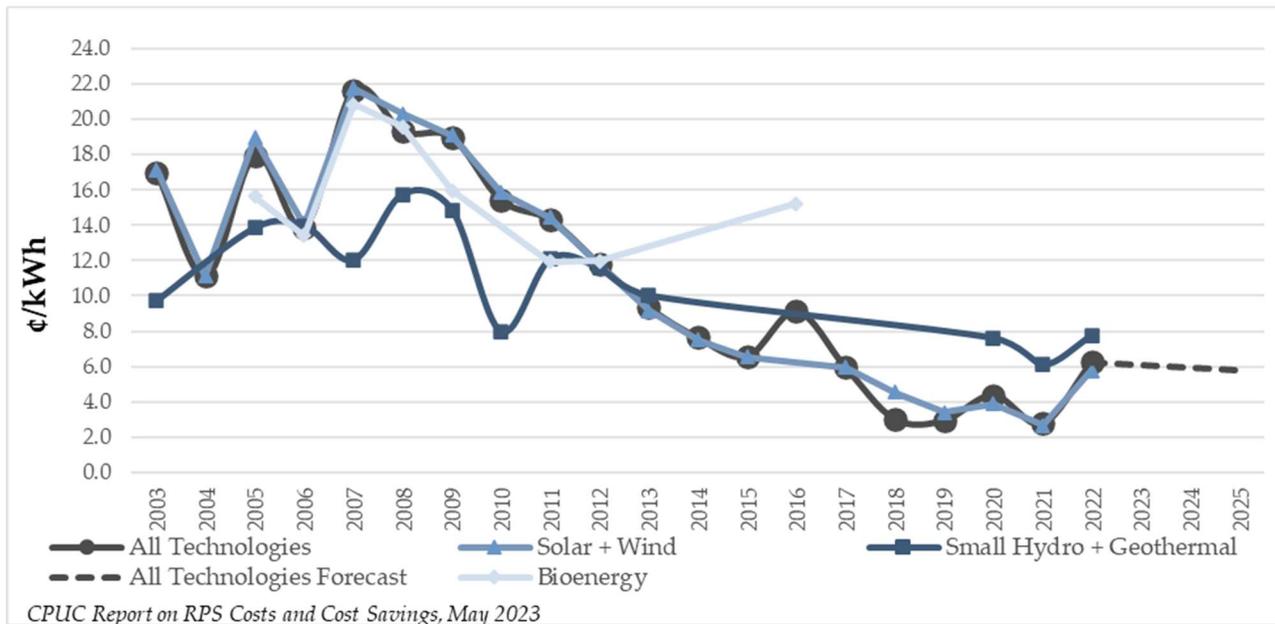
The overall contracted commitment in renewables by retail sellers in California has increased over time, which has contributed to the cost competitiveness of technologies, particularly solar and wind. Figure 7 illustrates the average annual contract prices of new contracts executed each year⁴⁷ for RPS eligible projects with capacities greater than 3 MW by technology category in cents per kilowatt-hour (¢/kWh) for all load-serving entities.

⁴⁵ The Least-Cost Best-Fit methodology is a valuation framework that the IOUs use for the rank ordering and selection of least-cost and best-fit renewable resources to comply with annual RPS obligations on a total cost basis.

⁴⁶ For more information on the IRP proceeding (R.20-05-0023), visit <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning>.

⁴⁷ The average annual contract prices in Figure 7 are an average of the contracts executed that specific year by technology type and are not rolling averages of previous years.

Figure 7: Historical Trend of All Load Serving Retail Sellers RPS Contract Costs by Technology and Year of Execution from 2003-2025 (Real-Dollar Value)⁴⁸



Data Source: CPUC 2023 Annual Report on Costs and Cost Savings for the RPS Program (Padilla Report)⁴⁹

Figure 7 shows that RPS contract prices, in real dollars, decreased on average of 1.3 percent annually between 2007 and 2022 for the “all technologies” group. The overall downward trend in contract prices can be attributed to falling prices for wind and solar technologies, which together make up the majority of the large IOUs’ collective RPS generating capacity. To remove non-representational trends, contracts with a nameplate capacity of less than 3 MW and those reported as net cost instead of total contract price were not included in Figure 7.⁵⁰

The average price of IOU, CCA, and ESP contracts executed in 2022 was 6.2¢/kWh compared to 4.3¢/kWh in 2021. Almost all procurement contracts with new facilities in 2022 were executed by CCAs. This increase in average contract price is due to notable purchases of higher cost renewable resource types such as geothermal. Continued supply chain impacts and inflation also likely impacted the higher price.

⁴⁸ Projects with a capacity of 3 MW or less made up a little over 1% of all of the IOUs’ contracted RPS capacity, and removing these figures eliminated non-representative trends from the data. As a result of this size exclusion, feed-in-tariff projects were not considered in the analysis above. In California, feed-in-tariff programs offer projects with a capacity of 3 MW or less a predetermined price (\$/MWh) to encourage market transformation for projects at these sizes. Additionally, contracts identified as REC-only payments were excluded as these values are not comparable to all-in energy, capacity, and REC contract prices.

⁴⁹ RPS 2023 Padilla Report to the Legislature on Costs and Savings for the RPS in 2022: <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/energy-reports-and-whitepapers/rps-reports-and-data>. Values were adjusted for inflation using the U.S. Bureau of Labor Statistics’ Producer Price Index (PPI) for the Electric Power Generation, Transmission, and Distribution Industry.

⁵⁰ Projects with a capacity of 3 MW or less made up roughly 2% of all of the IOUs’ contracted RPS capacity, and removing these figures eliminated non-representative trends from the data. As a result of this size exclusion, feed-in-tariff projects were not considered in the analysis above. In California, feed-in-tariff programs provide projects with a capacity of 3 MW or less capacity a predetermined price (\$/MWh) to encourage market transformation for projects at these sizes. Additionally, contracts identified as REC only payments were excluded as these values are not comparable to all in energy, capacity, and REC contract prices.

For more information on the costs of the RPS program, see the 2023 Annual Report on RPS Costs and Cost Savings (Padilla Report).⁵¹

⁵¹https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/Office_of_Governmental_Affairs/Legislation/2020/2020%20Padilla%20Report.pdf

Renewable Procurement and Project Development

This chapter uses the most current procurement and contracting data available as of September 2023 for all retail sellers in order to evaluate the state of new renewable project development.

Contracting and New Projects in Development

Large Investor-Owned Utilities (IOUs)

RENEWABLE ENERGY CREDIT (REC) SALES

Due to the IOUs' forecasted excess RPS procurement, the CPUC authorized the IOUs to hold REC sales solicitations in 2019, 2020, 2021, and 2022 to sell RPS energy from their portfolios.⁵² The IOUs' long RPS position is a result of forecasted excess RPS procurement and customer load departure. REC sales solicitations provide IOUs with the opportunity to optimize their portfolios as well as provide renewable resources for other retail sellers. The IOUs' REC sales also offer a path for smaller or newer retail sellers to procure quantities to meet their RPS compliance needs.

All three of the large IOUs have held REC sales solicitations in 2019, 2020, 2021, and 2022 and have requested CPUC approval of additional REC sales solicitations in 2023. However, because the IOUs will allocate "slices" of their entire Power Charge Indifference Adjustment (PCIA)-eligible RPS portfolios as part of the VAMO process, this multi-year trend in annual REC sales for excess RPS procurement may change when the VAMO process is fully completed, as discussed later in this report.

In 2022, PG&E, SCE, and SDG&E executed a total of 47 REC sales contracts. Table 11 below shows REC sales solicitation summaries by IOU.

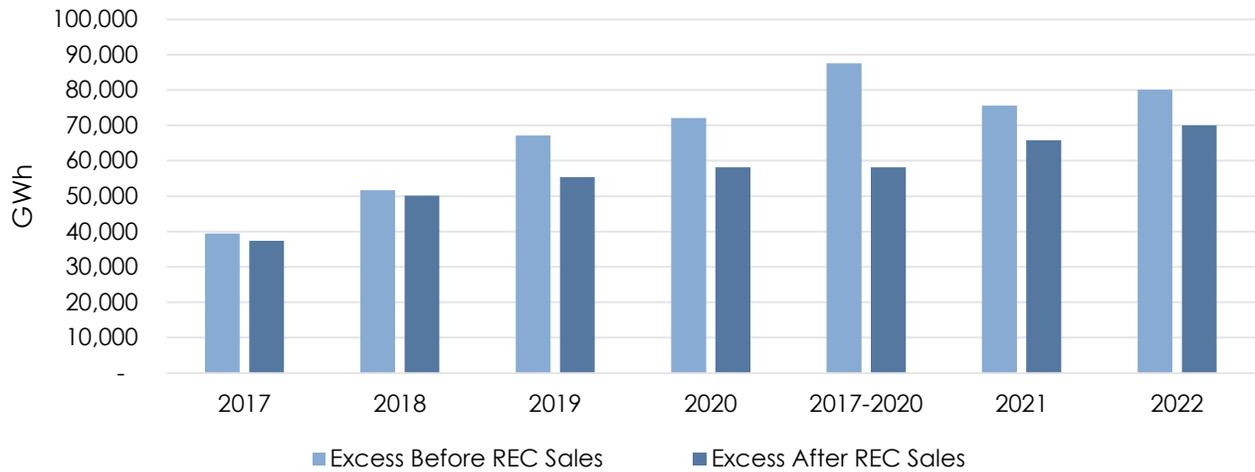
	PG&E		SCE		SDG&E		Totals	
	Contracts	GWh	Contracts	GWh	Contracts	GWh	Contracts	GWh
2020	2	500	12	4,742	1	175	15	5,417
2021	9	2,107	32	7,986	1	159	42	10,252
2022	15	2,936	30	5,905	2	1,180	47	10,021

Data Source: CPUC RPS Database, September 2023

As Figure 8 below shows, the IOUs' REC sales solicitations have resulted in a stabilization of excess procurement bank size. In aggregate, the IOUs have sold approximately 25,000 GWh of RPS energy from their portfolios from 2020 to 2022 and will sell additional RPS energy in 2023 and 2024 from existing executed REC sales and Market Offer contracts.

⁵² See D.19-12-042.

Figure 8: Aggregated IOU Excess Procurement Bank Before and After REC Sales



CPUC 2023 RPS Annual Report (November 2023)

Data Source: IOUs’ 2023 Draft Procurement Plans, Renewable Net Short calculations

Small and Multi-Jurisdictional Utilities (SMJUs)

BVES did not execute contracts for any additional RPS resources for 2022, while Liberty and PacifiCorp each executed two short-term unbundled REC contracts in 2022. Additionally, the CPUC adopted D.23-08-032 approving Liberty Utilities’ Application 21-04-006 to construct, acquire, own, and operate the Luning Expansion Project, a 50 MW solar photovoltaic and 250 MWh storage facility.

Community Choice Aggregators (CCAs)

To date, 15 CCAs have executed long-term contracts with new utility-scale⁵³ renewable projects that have not yet reached their commercial operation dates. The data in the tables below include projects that will come online in the future and does not represent an exhaustive list of all new CCA projects that have been contracted for and built over the last decade. Table 13 shows the in-state renewable energy projects that are currently under development by CCAs with commercial online dates in 2023 and 2024. Of the contracts listed, about 85% are for new solar PV resources, many of which include storage.

⁵³ Utility-scale projects refer to contract capacities of 20 MW or greater.

**Table 12: New California Renewables Projects with CCA Contracts
COD 2023–2024**

CCA	Technology	Capacity (MW)	County Location	Contract Term (Years)	COD⁵⁴
Central Coast Community Energy	Hybrid	20	Tulare	15	2024
Central Coast Community Energy	Solar PV	120	Kern	20	2023
Central Coast Community Energy	Solar PV	100	Riverside	15	2023
Central Coast Community Energy	Solar PV	70	Kern	12	2024
Central Coast Community Energy	Solar PV	63	Fresno	15	2024
Clean Power Alliance	Solar PV	84	Los Angeles	16	2023
Clean Power Alliance	Solar PV	117	San Bernardino	15	2023
Clean Power Alliance	Solar PV	65	San Bernardino	15	2023
Clean Power Alliance	Solar PV	48	San Bernardino	21	2023
Clean Power Alliance	Solar PV	89	Kern	15	2024
Clean Power Alliance	Solar PV	480	Tulare	15	2024
Clean Power Alliance	Solar PV	94	Riverside	15	2024
Clean Power Alliance	Solar PV	450	Riverside	15	2024
CleanPowerSF	Solar PV	20	Stanislaus	20	2024
East Bay Community Energy	Solar PV	125	Riverside	15	2024
East Bay Community Energy	Solar PV	100	Fresno	20	2023
East Bay Community Energy	Solar PV	50	San Bernadino	15	2023
Marin Clean Energy	Hybrid	110	San Bernadino County	15	2023
Marin Clean Energy	Wind	93	Santa Barbara County	15	2023
Peninsula Clean Energy	Solar PV	102	Kern	15	2023
Peninsula Clean Energy	Geothermal	26	Imperial	15	2023
Peninsula Clean Energy	Solar PV	100	Riverside	15	2024
Redwood Coast Energy Authority	Solar PV	100	Kern	15	2024
San Diego Community Power	Solar PV	137	Imperial	20	2023

**Table 12: New California Renewables Projects with CCA Contracts
COD 2023–2024**

CCA	Technology	Capacity (MW)	County Location	Contract Term (Years)	COD ⁵⁴
San Diego Community Power	Solar PV	75	Riverside	15	2023
San Jose Clean Energy	Solar PV	100	Fresno	20	2024
Silicon Valley Clean Energy	Solar PV	80	Kern	20	2023
Silicon Valley Clean Energy	Wind	78	Riverside	15	2023
Silicon Valley Clean Energy	Solar PV	20	Tulare	15	2024
Silicon Valley Clean Energy	Solar PV	100	Kern	15	2024
Sonoma Clean Power Authority	Solar PV	70	Stanislaus	20	2023
Valley Clean Energy Alliance	Solar PV	165	San Bernardino	20	2023
Valley Clean Energy Alliance	Solar PV	108	Kern	15	2023
Total MW		3,558			

Data Source: CCAs' Draft RPS Procurement Plans (July 2023), CCAs' Annual RPS Compliance Reports (August 2023)

The CCAs also contracted with new renewable projects with commercial online dates further into the future and located outside of California. The table below lists additional in-state renewables contracts with commercial online dates in 2025 – 2026. Of the contracts listed, most are for new solar PV resources in addition to wind and geothermal.

Table 13: New California Renewables Projects with Community Choice Aggregator Contracts COD 2025-2026					
CCA	Technology	Capacity (MW)	County Location	Contract Term (Years)	COD
CleanPowerSF	Solar PV	75	Alameda	25	2026
Marin Clean Energy	Solar	100	Kern	15	2025
Orange County Power Authority	Solar PV	90	Riverside	22	2026
Peninsula Clean Energy	Wind	76	Merced	15	2025
San Diego Community Power	Solar PV	90	San Diego	20	2026
San Diego Community Power	Solar PV	42	Imperial	20	2025
San Jose Clean Energy	Solar PV	48	Kern	15	2025
San Jose Clean Energy	Solar PV	105	Kern	15	2026
Silicon Valley Clean Energy	Solar PV	63	Fresno	15	2025
Sonoma Clean Power Authority	Solar PV	60	Kern	10	2025
Valley Clean Energy Alliance	Solar PV	27	Yolo	20	2025
Total MW		776			

Data Source: CCAs' RPS Draft Procurement Plans (July 2023), CCAs' Annual RPS Compliance Reports (August 2023)

Table 14 lists the CCAs' out-of-state contracts for new renewables projects.

Table 14: New Out-of-State Renewables Projects with Community Choice Aggregator Contracts COD 2023-2025					
CCA	Technology	Capacity (MW)	County Location	Contract Term (Years)	COD
Central Coast Community Energy	Solar PV	75	Clark, NV	20	2023
Central Coast Community Energy	Solar PV	150	La Paz, AZ	10	2023
Marin Clean Energy	Geothermal	20	Pershing, NV	20	2025
San Diego Community Power	Solar PV	35	Clark, NV	20	2025
San Jose Clean Energy	Geothermal	25	Clark, NV	20	2025
Silicon Valley Clean Energy	Solar PV	50	Clark, NV	20	2023
Silicon Valley Clean Energy	Solar PV	50	La Paz, AZ	10	2025
Total MW		405			

Data Source: CCAs' RPS Draft Procurement Plans (July 2023), CCAs' Annual RPS Compliance Reports (August 2023)

The above CCAs have also entered into contracts with RPS facilities that are already in commercial operation and there are additional CCAs that have only entered into contracts with RPS facilities that are already in commercial operation.

Electric Service Providers (ESPs)

While historically the majority of ESPs exclusively contracted with existing renewable energy facilities that had already achieved commercial operation, and preferred to contract for short-term procurement, ranging from one to three-year terms, this is no longer the case. Since 2020, six ESPs have executed long-term contracts with new utility-scale renewable resources to meet the 65 percent long-term contracting requirement.

Table 15 shows the new long-term contracts executed by ESPs that have not yet reached their commercial operation dates.

Table 15: New Long-term Renewables Projects with ESP Contracts					
ESP	Technology	Capacity (MW)	County Location	Contract Term (Years)	COD
Constellation NewEnergy	Solar PV	52	San Bernardino	11	2023
Constellation NewEnergy	Solar PV	100	Riverside	10	2023
Direct Energy Business	Solar PV	70	Riverside	10	2024
EDF Industrial Power Services	Solar PV	150	Fresno	10	2023
Shell Energy North America	Solar PV	200	Kern	15	2024
Shell Energy North America	Solar PV	100	La Paz County (AZ)	10	2024
Total MW		672			

Data Source: ESPs' Draft RPS Procurement Plans (July 2023) and ESPs' Annual RPS Compliance Reports (August 2023)

Progress in Long-Term Contracting

A key aspect of meeting RPS requirements is meeting the long-term contracting requirement which requires all retail sellers to procure 65 percent of their RPS portfolios through long-term contracts⁵⁵ beginning in Compliance Period 2021–2024. Retail sellers were allowed to elect early compliance with the long-term contracting requirements.⁵⁶ Retail sellers who elected to comply early with the 65 percent long-term contracting requirement began procuring 65 percent of their RPS requirements from long-term contracts in Compliance Period 2017–2020, instead of Compliance Period 2021–2024. Six retail sellers, including all IOUs, elected to early-comply.⁵⁷ This section uses RPS compliance report data to identify the status and progress of all retail sellers in meeting the long-term contracting requirement. See Compliance and Enforcement section of this report for the status and progress regarding overall RPS requirements.

The IOUs and SMJUs are well-positioned to meet the 65 percent long-term contracting requirement. All the operational CCAs meet the requirement as well, though some have more excess than others. Only three ESPs forecast shortfalls, raising concerns for their potential failure in meeting overall RPS requirements.

⁵⁵ Long-term contracts are defined as contracts with a term of ten or more years.

⁵⁶ See D.17-06-026 "Decision Revising Compliance Requirements for the California Renewables Portfolio Standard in Accordance with Senate Bill 350," for more information.

⁵⁷ Retail sellers electing early compliance include PG&E, SCE, SDG&E, BVES, PacifiCorp, and The Regents of the University of California.

Large Investor-Owned Utilities: Each IOU has elected to comply early with the 65 percent long-term requirement and the three large IOUs are forecasted to meet their long-term contracting requirements for Compliance Period 2017–2020 and Compliance Period 2021-2024. Nearly all RPS contracts executed by the three IOUs for the purposes of complying with the RPS program have contract term lengths of 10 or more years.

Small and Multi-Jurisdictional Utilities: The three SMJUs are forecasted to meet their long-term contracting requirements for Compliance Period 2017–2020 and Compliance Period 2021-2024. BVES and PacifiCorp elected to comply early with the 65 percent long-term contracting requirement. Liberty and BVES have already executed sufficient long-term contracts and nearly all of PacifiCorp’s RPS procurement from 2019 through 2030 is derived from long-term contracts.

Community Choice Aggregators: As reflected in Table 17, all the operational CCAs are forecasted to meet their long-term procurement requirement in Compliance Period 2017-2020 and 2021-2024. CCAs have generally improved their long-term position, partly as a result of the VAMO process. However final assessments of the 65 percent requirement are based on procured generation and there are still a few long-term contracts for projects that have not yet reached commercial operation.

Table 16: Forecast Percentage of CCA 65% Long-Term Contract Requirements Met ⁵⁸		
CCA Name	Compliance Period 2017–2020	Compliance Period 2021–2024
Apple Valley Choice Energy	100%	100%
Central Coast Community Energy	100%	100%
City of Baldwin Park ⁵⁹	100%	100%
City of Palmdale	N/A	100%
City of Pomona	100%	100%
City of Santa Barbara	N/A	100%
Clean Energy Alliance	N/A	100%
Clean Power Alliance	100%	100%
CleanPowerSF	100%	100%
Desert Community Energy	100%	100%
East Bay Community Energy	100%	100%
King City Community Power	100%	100%
Lancaster Choice Energy	100%	100%
Marin Clean Energy	100%	100%
Orange County Power Authority	N/A	100%
Peninsula Clean Energy	100%	100%
Pico Rivera Innovative Municipal Energy	100%	100%
Pioneer Community Energy	100%	100%
Rancho Mirage Energy Authority	100%	100%
Redwood Coast Energy Authority	100%	100%
San Diego Community Power	N/A	100%
San Jacinto Power	100%	100%
San José Clean Energy	100%	100%
Silicon Valley Clean Energy	100%	100%
Solana Energy Alliance ⁶⁰	100%	100%
Sonoma Clean Power Authority	100%	100%
Valley Clean Energy	100%	100%
Western Community Energy ⁶¹	100%	0%

Data Source: CCAs' Annual RPS Compliance Reports (August 2023)

⁵⁸ The procurement contracts have not been fully reviewed by the CPUC and these are forecasted compliance percentages based on self-reported data.

⁵⁹ City of Baldwin Park deregistered as a CCA and is no longer serving load

⁶⁰ Solana Energy Alliance deregistered as a CCA and is no longer serving load

⁶¹ Western Community Energy deregistered as a CCA and is no longer serving load

Electric Service Providers: With the long-term contracting requirement increasing from 0.25 percent of retail sales⁶² to 65 percent of a retail sellers' procurement quantity requirement, some ESPs still need to execute notable amounts of long-term contracts to meet the RPS requirements, as reflected in Table 18.

Three ESPs plan to stop serving load in the 2021-2024 Compliance Period, while there is one market entrant, Brookfield Renewable Energy Marketing. Of the eleven ESPs that forecast serving load in the 2021–2024 Compliance Period, eight ESPs forecast having enough long-term RPS energy procurement, while three require additional procurement. One of the three requiring additional procurement, Calpine Energy Solutions, met requirements in its previous Compliance Report, but its compliance procurements have not kept pace with requirements for the 2021-2024 Compliance Period.

Table 17: Forecasted ESP Percentage of 65% Long-Term Contract Requirements Met⁶³

ESP Name	Compliance Period 2017–2020	Compliance Period 2021–2024
3 Phases Renewables	100%	100%
American PowerNet	100%	N/A ⁶⁴
BP Energy Retail	100%	100%
Brookfield Renewable Energy Marketing U.S.⁶⁵	N/A	100%
Calpine Energy Solutions	100%	81%
Calpine Power America	100%	100%
Commercial Energy of California	100%	100%
Constellation NewEnergy	100%	100%
Direct Energy Business	100%	100%
Just Energy Solutions	100%	N/A ⁶⁶
Pilot Power Group	100%	93%
Shell Energy North America	100%	58%
Tiger Natural Gas	100%	N/A ⁶⁷
UC Regents	100%	100%

Data Source: ESPs' Annual RPS Compliance Reports (August 2023)

⁶² See D.12-06-038 "Decision Setting Compliance Requirements for the California Renewables Portfolio Standard Program," for more information on the long-term contracting requirement under SB 2 (1X) (Simitian, 2011).

⁶³ The procurement contracts have not been fully reviewed by the CPUC and these are forecasted compliance percentages based on self-reported data.

⁶⁴ American PowerNet plans to not serve load in the 2021-2024 compliance period.

⁶⁵ Brookfield Renewable Energy Marketing U.S. (BREMUS) is a new ESP that registered with the CPUC as an effective May 3, 2022 and is not yet serving load.

⁶⁶ Just Energy Solutions plans to not serve load in the 2021-2024 compliance period.

⁶⁷ Tiger Natural Gas plans to not serve load in the 2021-2024 compliance period.

Compliance and Enforcement

This chapter provides an overview of the RPS program's compliance and enforcement process. Each August, retail sellers are required to submit annual preliminary RPS Compliance Reports to the CPUC that contain historical and forecasted data on their renewable procurement. The CPUC uses these reports to conduct analysis of retail sellers' progress towards the RPS mandates and identify any compliance risks based on the information provided by retail sellers. The reports are necessary for the CPUC to quantify each retail seller's procurement and facilitates the CPUC's determination of the forecasted compliance status of each retail seller.

Specifically, compliance with the RPS program is measured in eligible RECs⁶⁸ and evaluated on a multi-year compliance basis. The CPUC works closely with the CEC to make formal compliance determinations, using the CEC's Procurement Verification Report⁶⁹ to confirm each retail seller's actual REC claims. The CEC utilizes reports from the Western Renewable Energy Generation Information System (WREGIS)⁷⁰ to determine the amount of renewable electricity generated by each RPS-eligible facility. The CEC analyzes the eligibility of the facility, the quantity of RECs created, and ensures each REC claimed by retail sellers is eligible for compliance and not double-counted. The CPUC reviews retail sellers' final RPS Compliance Reports and RPS contracts in conjunction with the CEC's Procurement Verification Report to determine compliance. These compliance determinations cannot take place until the CEC completes its verification process and the CPUC thereafter completes its compliance review. Additional details regarding RPS compliance and enforcement are in Appendix B of this report.

CPUC Compliance Determinations

To ensure electricity retail sellers meet their RPS requirements, the CPUC is responsible for establishing enforcement procedures and imposing penalties for non-compliance with the RPS program. As noted above, requirements are based on a compliance period. Compliance is determined after a compliance period has been completed and the CEC has verified REC claims. In 2017, the CPUC evaluated RPS-eligible procurement and made final compliance determinations for Compliance Period 2011–2013 and determined that six retail sellers were non-compliant with their RPS procurement obligations.⁷¹

In 2019, the CPUC made final compliance determinations for Compliance Period 2014–2016 and found that out of 26 retail sellers, 3 were non-compliant with their RPS procurement obligations. Two of these three retail sellers did not meet the long-term contracting requirement and, therefore, could not count their

⁶⁸ A REC is a market-based instrument that represents the property rights to the environmental, social, and other non-power attributes associated with the production of electricity from a renewable source. RECs represent a claim on the renewable attributes of one unit of energy (MWh) generated from a renewable resource. RECs are "created" by a renewable generator and its creation is simultaneous with the production of electricity. When an LSE decides to use RECs for compliance with the State's RPS program, it must be retired and cannot be used again.

⁶⁹ See <https://www.energy.ca.gov/programs-and-topics/programs/renewables-portfolio-standard/renewables-portfolio-standard-1-0> for the most recent RPS Verification Report issued by the CEC.

⁷⁰ The Western Renewable Energy Generation Information System (WREGIS) is an independent renewable energy tracking system for the region covered by the Western Electricity Coordinating Council (WECC). All renewable generation in the WECC must be tracked through WREGIS and used for state RPS programs.

⁷¹ The six retail sellers include Commercial Energy of California, Commerce Energy (Just Energy Solutions), Direct Energy Business, Gexa Energy, Liberty Power Holdings, and Tiger Natural Gas.

short-term procurement toward their procurement quantity requirement (PQR). The third non-compliant retail seller did not procure enough RECs to meet its requirements.⁷²

On January 25, 2023, the CEC adopted *Renewables Portfolio Standard 2017-2020 Retail Sellers Procurement Verification Commission Final Report*. As required, 30 days later on March 3, 2023, 47 retail sellers filed Final 2017-2020 RPS Compliance Reports. The CPUC is still in the process of reviewing the reports and thus, there have not been any compliance determinations or enforcement actions related to the CPUC's compliance review of Compliance Period 2017-2020. The CPUC expects to issue determinations in Q4 2023.

Enforcement

COMPLIANCE PERIOD 2011–2013

In December 2017, the CPUC issued compliance determination letters to the 20 retail sellers operating in Compliance Period 2011–2013. Six entities failed to comply with either the long-term contracting requirement and/or the PQR. Four retail sellers accepted the CPUC's determination and paid their non-compliance penalties. Two retail sellers, Gexa Energy California and Liberty Power Holdings, filed for waivers of their respective RPS penalties under § 399.15 of the Public Utilities Code. In August 2019, the CPUC issued a decision denying the two retail sellers' requests for waiver of their penalties. These two retail sellers were required to pay a cumulative sum of over \$2 million.⁷³ The total penalties collected for Compliance Period 2011–2013 were approximately \$4.1 million which went to the state's General Fund.

COMPLIANCE PERIOD 2014–2016

In October 2019, the CPUC issued compliance determination letters to the 26 retail sellers operating in Compliance Period 2014–2016. Three entities failed to comply with either the long-term contracting requirement and/or the PQR. One retail seller, Commercial Energy, accepted the compliance determination and timely paid their non-compliance penalty.

One of the non-compliant retail sellers, Agera Energy, filed for Chapter 11 bankruptcy in October 2019 and neither filed a waiver request nor paid the penalties. In 2020, Agera Energy exited the California market and formally de-registered as an ESP. Consequently, collection of Agera Energy's Compliance Period 2 penalties is contingent on Agera Energy's ongoing bankruptcy proceedings. In April 2023, Agera provided a partial payment of \$15,988.44. Gexa Energy California, again, filed for a waiver of their assessed RPS penalties, and the CPUC adjudicated their waiver request resulting in a revised penalty of \$352,500. The total penalties collected for Compliance Period 2014–2016 were \$526,223.44. These penalties were deposited in the Electric Program Investment Charge Fund reducing ratepayers investment costs in scientific and technological research to meet the state's energy and climate goals.⁷⁴

⁷² See D.17-06-026 for more information on the RPS long-term contracting rules.

⁷³ D.19-08-007.

⁷⁴ Per Public Utilities Code § 399.15(b)(8), the penalties collected for the RPS program are deposited into the Electric Program Investment Charge (EPIC) fund.

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COMPLIANCE PERIOD 2017–2020

Compliance will be determined after the CPUC completes its review of the retail sellers' Final 2017-2020 RPS Compliance Reports. Retail sellers will be notified if they met RPS requirements or if a penalty payment is required. Determinations will be reported in next year's report and on the CPUC website.

2022 RPS Program Activities

This chapter identifies and discusses key 2022/2023 RPS program activities and accomplishments including implementation of legislation, procurement activities, and interagency planning and coordination. Appendix C includes a detailed list of RPS program activities.

Integrated Resource Planning (IRP) and RPS Alignment

Since SB 350 was adopted in 2015, the CPUC has been coordinating between the RPS program and the IRP program. The CPUC adopted an IRP framework in 2018 to coordinate and refine long-term planning requirements for CPUC-jurisdictional retail sellers, which includes planning for increasing renewables.⁷⁵ Activities in the IRP proceeding are complementary to RPS procurement activities and resource planning for the electric sector.

The CPUC is working to align the IRP and RPS proceedings to further coordinate planning efforts and address the overlap in reporting and procurement requirements. In September 2020, the CPUC released a Staff proposal that incorporates RPS Procurement Plans into retail sellers' IRP filings and requires retail sellers to submit IRP off-year filings to meet annual statutorily mandated RPS reporting requirements. The Staff proposal included a streamlined, coordinated schedule to allow the RPS and IRP proceedings to converge on the same timeline, and parties to the RPS proceeding have commented on this Staff proposal. The Staff proposal and party comments are under consideration by the CPUC, and next steps will be provided by subsequent CPUC decision(s) or ruling(s).⁷⁶ Additionally, retail sellers' annual RPS procurement plans are required to show how they align or conform with their respective IRPs.

Voluntary Allocation and Market Offer Process for RPS Portfolio Optimization

On May 24, 2021, the CPUC issued Decision (D.) 21-05-030 to authorize new Voluntary Allocation, Market Offer, and Request for Information (RFI) processes for large IOU RPS contracts subject to the Power Charge Indifference Adjustment (PCIA). The adopted Voluntary Allocation and Market Offer (VAMO) mechanism is an authorized process for PG&E, SCE, and SDG&E to allocate a "slice" of their entire PCIA-eligible RPS portfolios to eligible retail sellers (such as CCAs, ESPs, and the IOUs themselves) in proportion to their vintaged, forecasted annual load share. The purpose of the VAMO and RFI processes is to reduce excess and uneconomic resources in the IOUs' PCIA-eligible RPS portfolios through voluntary and market-based solutions.

Voluntary Allocations

As the initial step in the VAMO process, some eligible retail sellers selected to take Voluntary Allocations of their share, or "slice", of an IOU's PCIA-eligible RPS portfolio. Voluntary Allocations featured standard offer contracts with fixed prices that are based on the applicable year's market price benchmark. Eligible retail sellers were permitted to elect a short-term allocation, a long-term allocation, or were permitted to decline all or a portion of their allocation of RPS resources. Although Voluntary Allocations may be held no

⁷⁵ See D.18-02-018.

⁷⁶ To be issued in R.18-07-003 or R.20-05-003 or subsequent proceedings.

more than once in an RPS compliance period, a newly formed retail seller may request an initial Voluntary Allocation if its launch does not coincide with a regular VAMO cycle.

The IOUs completed their initial Voluntary Allocation contracting on July 29, 2022. While the IOUs elected to receive 100 percent of their respective shares of Voluntary Allocations, the results for the non-IOU retail sellers’ Voluntary Allocations were mixed across the three large IOU service territories. 24 of the eligible 35 non-IOU retail sellers elected to receive 45.7 percent of the total PCIA-eligible RPS resource volumes available to them for Voluntary Allocation through a mix of short- and long-term allocations.⁷⁷ The CPUC approved the Voluntary Allocations on November 3, 2022.

Market Offers

After the voluntary allocations, the IOUs solicited Market Offers for all PCIA-eligible RPS energy remaining after the Voluntary Allocations. Unlike Voluntary Allocations, IOUs may propose more than one Market Offer in an RPS compliance period and Market Offers are closely based on previously approved IOU REC sales solicitations in the CPUC’s RPS proceeding in terms of solicitation processes, contract formats, and fixed pricing. The IOUs each held two Market Offer solicitations in 2023. In January, the IOUs conducted Short-Term Market Offer Solicitations and the resulting executed contracts were approved by the CPUC in May 2023. In March and April of this year, the IOUs conducted Long-Term Market Offer solicitations for volumes that remained after Voluntary Allocations from long-term contracts in their PCIA-eligible RPS portfolios. The IOUs were required to offer 35 percent of their respective remaining volume as long-term product, and 65 percent of their respective remaining volume as either long or short-term product. The CPUC is in the process of reviewing the Long-Term Market offer solicitations and contracts via the advice letter and resolution process.

As shown below in Table 18, the IOUs executed 17 contracts for an expected total of 46.2 million MWh.

IOU Service Territory	Quantity of Contracts	Estimated Total Quantity of Generation (MWh)
Pacific Gas and Electric	10	26,743,338
Southern California Edison	3	17,090,973
San Diego Gas & Electric	4	2,343,668
Total	17	46,177,979

Requests for Information

D.21-05-030 additionally directed the three IOUs to issue at least two requests for information (RFI) for contract modifications and assignments. The IOUs each included RFIs in their 2021 and 2022 RPS Procurement Plans and none have proposed to issue a third RFI in their draft 2023 RPS Procurement Plans. No contract amendments or assignments have been submitted for CPUC approval as a result of the RFIs.

⁷⁷ Calculated as the statewide *weighted* total of Non-IOU retail seller Voluntary Allocation Elections

Workshop and Report

Ninety days following conclusion of the market offer solicitations, the IOUs submitted reports (90-Day Report). In their 90-Day Reports, all three IOUs conclude that VAMO was a success with all or a majority of VAMO-eligible resources either allocated or sold. As a result, the IOUs anticipate having physical short RPS positions starting as early as this year but being able to meet RPS requirements using previous excess RPS procurement (or “banked” RECs). Next, the IOUs will jointly hold a workshop on November 6, 2023 on VAMO effectiveness. After the workshop, the IOUs are each required to file advice letters regarding whether the IOU requests to conduct another VAMO cycle for the subsequent RPS compliance period.

Implementation of AB 843

On October 26, 2022, an Order Instituting Rulemaking (OIR) (R.22-10-010) was issued to implement Assembly Bill (AB) 843 (Aguiar-Curry, 2021).⁷⁸ The proceeding considers the ability of Community Choice Aggregators (CCAs) to use any available procurement capacity in the BioMAT program. On April 28, 2023, RPS staff conducted a public workshop to solicit input on several proposed BioMAT program changes from a wide range of stakeholders including IOUs, CCAs, the CPUC Public Advocates Office, numerous industry groups, local jurisdictions, environmental justice advocates and local air quality regulators. The BioMAT program has now incorporated several revisions – including an integration of IOU and CCA market procurement platforms - in order to support CCA integration into BioMAT to use the RPS-eligible and Resource Adequacy (RA) biofuel-based energy procurement pathway previously only available to the IOUs. A final CPUC decision approving the implementation plan is scheduled for November 2023. For additional information on BioMAT program see below.

Additional Mandated RPS Procurement Activities

The IOUs are required to procure renewable energy through mandated programs to meet additional State policy goals. SMJUs, CCAs, and ESPs are not required to procure RPS resources through these mandated programs. Bioenergy program costs, though, are allocated to all IOUs, CCA, and ESP customers.⁷⁹

Feed-in Tariff Programs

California’s Feed-in Tariff (FIT) program is a policy mechanism designed to accelerate investment in small, distributed renewable energy technologies. The goal of the FIT program is to offer long-term contracts and price certainty for financing renewable energy investments to aid in transforming these markets. The RPS program has two FIT programs:

- Renewable Market Adjusting Tariff (ReMAT)
- Bioenergy Market Adjusting Tariff (BioMAT)

⁷⁸ AB 843 amended Public Utilities Code Section 399.20 to extend to CCAs within an IOU’s service territory the existing renewable feed-in tariff (BioMAT) for qualifying bioenergy electric generation facilities. AB 843 authorizes a CCA to execute contracts for eligible bioenergy projects and submit those contracts for cost recovery pursuant to the BioMAT program, if open capacity exists within the 250 MW BioMAT program limit. AB 843 additionally requires that every kilowatt hour of electricity purchased from a qualifying bioenergy electric generation facility count toward both the CCA’s RPS procurement requirements and the BioMAT project procurement requirements of the IOU whose service territory encompasses the CCA.

⁷⁹ Per SB 859, all customers are required to support the BioRAM program through a non-bypassable charge as implemented in D.18-12-003; the BioMAT program implemented a similar non-bypassable charge in D.20-08-043 as part of program improvements.

Both programs have capacity procurement amounts established by the Legislature, which are allocated to each IOU based on their proportionate share of statewide electric load served.

RENEWABLE MARKET ADJUSTING TARIFF (REMAT)

ReMAT⁸⁰ is a FIT program established by SB 32 (Negrete McLeod, 2009) and SB 2 (1X) (Simitian, 2011), which commenced offering fixed-price standard contracts in 2013. IOU procurement through the ReMAT program is for RPS energy from small facilities (generating up to 3 MW),⁸¹ such as small hydro, solar PV, and wind, to sell renewable electricity to utilities under standard terms and conditions. ReMAT features administratively set prices by product category with a time-of-delivery adjustment. In June 2023, the CPUC approved an annual ReMAT pricing update per the methodology adopted in D.20-10-005.

Table 19 below provides an overview of the progress that each IOU has made toward their ReMAT capacity mandate from the program’s inception in 2013 to present. The ReMAT program has a total of 212 MW of capacity remaining.

IOU	Section 399.20 Procurement Requirement	ReMAT Contracted (MW)	ReMAT Remaining (MW) ⁸²
PG&E	218.8	42.31	110.54
SCE	226	43.81	74.64
SDG&E	48.8	7.58	20.82
Total	493.6	93.7	212.22

Data Source: PG&E, SCE, and SDG&E ReMAT Program web pages (September 2023).

BIOENERGY MARKET ADJUSTING TARIFF (BIOMAT)

BioMAT is a FIT program established by SB 1122 (Rubio, 2012), which set a 250 MW procurement program requirement for small-scale bioenergy projects.⁸³ The goal of the BioMAT program is to promote competition for entrants to the bioenergy market using a simplified procurement mechanism. BioMAT procurement is allocated to three discrete bioenergy categories: Biogas, Agriculture, and Sustainable Forest Management. The program was implemented in 2014⁸⁴ and uses a standard contract and a market-based

⁸⁰ The ReMAT program replaced California’s original FIT program established by AB 1969 (Yee, 2006) to expand the program and increase eligible project size from a maximum of 1.5 MW to 3 MW.

⁸¹ AB 1979 (Bigelow, 2016) modified the program to increase the maximum project capacity to 4 MWs for conduit hydroelectric facilities, if they deliver no more than 3 MW.

⁸² Remaining amount accounts for contracting done via the original FIT program as well as contracting via ReMAT.

⁸³ AB 1923 (Wood, 2016) increased eligible project size to 5 MW, and more recently AB 843 (Aguilar-Curry, 2021) expanded the program to CCAs that wish to participate.

⁸⁴ See D.14-12-081.

mechanism to arrive at the offered program contract price. See above for information on AB 843 (Aguiar-Curry, 2021) implementation.

Table 20 shows the BioMAT targets and capacity (MW) procured over the life of the program by the three IOUs.

Table 20: BioMAT Mandated Allocation by IOU					
BioMAT Category	BioMAT MW Allocation	MW Contracted	MW Remaining	# of Contracts	Current Contract Price (\$/MWh)
Biogas	110	13.43	96.57	7	127.72
Dairy/Agriculture	90	30.23	59.77	21	187.72 (Dairy) 183.72 (Other Agriculture)
Sustainable Forest Management	50	19.88	30.12	7	199.72
Total	250	63.54	186.46	35	-

Data Source: PG&E, SCE, and SDG&E BioMAT Program web pages (September 2023).

BioMAT contracts were initially offered at \$127.72/MWh. All contracts in the Biogas category have been executed at the program starting price of \$127.72/MWh. All of the contract executions in the Sustainable Forest Management category have occurred at a price of \$199.72/MWh. These prices are also the current price offerings as shown in Table 22.

BioMAT Technical Working Group on GHG Emissions

Pursuant to D.20-08-043, in April 2021 the CPUC established a technical working group of stakeholders to develop a project specific lifecycle greenhouse gas emissions reduction model to quantify the net emissions of the BioMAT program project operations. The CPUC solicited participation from technical experts from parties, public agencies, academia, industry, national labs, and research institutions. The working group is utilizing a Lifecycle Assessment (LCA) approach to assessing BioMAT project emissions by analyzing the impacts of these emissions relative to an alternate baseline scenario. The final BioMAT LCA tool is expected to be available for public comment in spring 2024.

BIOENERGY RENEWABLE AUCTION MECHANISM (BIORAM)

In 2016, the CPUC implemented Governor Brown’s October 2015 Emergency Order Addressing Tree Mortality by establishing the BioRAM program. BioRAM uses the RPS standardized renewable auction mechanism (RAM) contract to streamline the procurement process.⁸⁵ Subsequently, Senate Bill 859 (2016)⁸⁶

⁸⁵ See https://www.ca.gov/archive/gov39/wp-content/uploads/2017/09/10.30.15_Tree_Mortality_State_of_Emergency.pdf.

⁸⁶ Senate Bill 859 (Committee on Budget and Fiscal Review, 2016) directs the CPUC to extend contracts for biomass facilities and addresses the statewide tree mortality issue by requiring that 60 percent of forest biomass used to create bioenergy is harvested from Tier 1 and Tier 2 high hazard zones. In 2018, Governor Brown signed SB 901 (Dodd, 2018), which modifies the HHZ definition and expands flexibility for certain BioRAM facilities that choose to modify their contracts.

directed additional BioRAM procurement which resulted in the large IOUs requirement to procure 146 MWs of bioenergy from High Hazard Zones (HHZ)⁸⁷ fuel. Senate Bill 901 (Dodd, 2018) further amended the BioRAM program to add program flexibility and extend certain biomass contracts by five years. Senate Bill 1109 (Caballero, 2022) further extended certain eligible biomass contracts by a minimum of five years but not to exceed fifteen years.

To implement SB 1109, the CPUC has recently approved Resolution E-5288 that requires the IOUs to extend their existing BioRAM contracts, and/or procure new contracts to fulfill their proportional share of 125 MW established in Res. E-4805, by December 1, 2023. In order to be eligible for these contracts, biomass resources cannot be located in a federal severe or extreme non-attainment area for particulate matter or ozone, and must have emissions more stringent than, or equivalent to, the best available retrofit control technology as determined by the local air pollution control or air quality district.

The table below lists the IOUs’ BioRAM contracts.

Table 21: IOU BioRAM Contract Summary⁸⁸

IOU	Facility Name	Location	Capacity (MW)
PG&E	Burney Forest Products	Shasta County, CA	29
PG&E	Shasta Sustainable Resource Management	Shasta County, CA	34
PG&E	Woodland Biomass	Yolo County, CA	25
SCE	Rio Bravo Rocklin	Placer County, CA	24
SCE	Pacific Ultrapower Chinese Station	Tuolumne County, CA	18
SDG&E	Honey Lake Power Company	Lassen County, CA	24
Total			156

Data Source: CPUC RPS Database, September 2023

The IOUs collect quarterly data from the BioRAM facilities to track the amount of bioenergy that is being produced from HHZ forest fuel. In addition, the IOUs are required to perform an annual audit to verify the amount of HHZ fuel that BioRAM facilities utilize on a calendar year basis and measure the verified amount. In 2023, the IOUs completed independent audits on each facility’s 2022 HHZ fuel usage.

HHZ fuel usage data for the current IOU-contracted BioRAM facilities is aggregated in Table 22.

⁸⁷ For more information on high hazard zone areas, see CALFIRE’s website: <https://frap.fire.ca.gov/mapping/maps/>.

⁸⁸ SCE’s BioRAM contract with Rio Bravo Fresno for 24 MW of capacity ended in September 2022.

Table 22: High Hazard Zone (HHZ) Forest Fuel Usage from BioRAM Contracts

Year	BioRAM HHZ % Requirements	Average % of Total Biomass Fuel from HHZ Fuel	Total HHZ Delivered (BDT) ⁸⁹	Total HHZ Usage To-Date (BDT)
2017	50%	54.6%	267,745	267,745
2018	60%	56.5%	671,846	939,591
2019	60% and 80% ⁹⁰	84%	1,557,050	2,505,641
2020	60% and 80%	79%	862,147	3,367,788
2021	60% and 80%	82.5%	844,527	4,212,315
2022	60% and 80%	84%	951,677	5,136,208

Data Source: CPUC Aggregated Data from IOUs as Described in Annual HHZ Fuel Verification Reports

Interagency Program Planning and Coordination

The CPUC coordinates closely with its sister state agencies on an ongoing basis to promote and implement consistent statewide RPS policies that benefit all Californians. The CPUC, for instance, works with the CEC, California Air Resources Board (CARB), California Independent System Operator (CAISO), and California Department of Forestry and Fire Protection (CAL FIRE) on issues and projects such as: statewide RPS compliance and enforcement, integration of storage, wildfire safety and mitigation, offshore wind development, and transmission planning.

Compliance and Enforcement

The CPUC coordinates closely with the CEC to ensure a consistent policy approach for RPS compliance and enforcement. The CPUC depends on the CEC’s compliance verification report to inform its RPS compliance determinations. See Chapter IV and Appendix B for more details on RPS compliance and enforcement.

Bioenergy Issues and Forest Management

The issue of forest health and its impact on wildfire mitigation intersects with the RPS programs of BioMAT and BioRAM. To ensure that these programs effectively address the State’s policy goals, CPUC staff work with stakeholders and other agencies, such as CEC, CARB, Department of Conservation, CAL

⁸⁹ Bone Dry Tons, which commonly accepted to be a 1:1 equivalent with megawatt-hours (MWh), refers to the measurement of biomass that has a 0 percent moisture content.

⁹⁰ Individual tree mortality BioRAM facility HHZ requirements vary based on the contract.

FIRE, and United States Department of Forestry (USFS) to address program costs and barriers to HHZ woody biomass procurement.

The CPUC participates in regular, ongoing forums that address the State's wildfire mitigation efforts due to high fire threat exacerbated by prolonged drought conditions, bark beetle infestation, and climate change. Specifically, the CPUC is an active participant in the Governor's Wildfire and Forest Resilience Task Force, and RPS staff participate in quarterly meetings with other State and Federal agencies that support forest biomass utilization.

Offshore Wind Task Force and Marine Renewable Energy Working Group

The CPUC is a member of the California Offshore Wind Task Force (Task Force) and the Marine Renewable Energy Working Group (MREWG), inter-agency efforts led by the CEC and Ocean Protection Council, respectively. The Task Force seeks to promote regulatory consistency and to improve scientific data that balances emerging technologies and planning for siting marine renewables for the energy needs of all Californians. The MREWG coordinates across state agencies to streamline regulatory processes.

The CPUC's role is to offer insight into the RPS procurement and IRP processes, as well as details of CPUC proceedings that inform procurement need from offshore wind. The CPUC supports offshore wind development with the caveat that additional research and data are needed before moving forward. The CPUC considers offshore wind in its IRP process, where the resource is available for potential selection in the IRP capacity expansion model. The IRP proceeding continues to refine offshore wind data to optimally inform the procurement process.

On August 10, 2022, the CEC adopted a report⁹¹ that evaluates offshore wind capacity in waters off the California coasts and establishes offshore wind planning goals. Preliminary findings in the report set planning goals of 2,000-5,000 megawatts (MW) of offshore wind by 2030 and 25,000 MW by 2045, enough electricity to power 3.75 million homes initially and 25 million homes by mid-century. The Pacific Offshore Wind Summit convened the State's policy leaders, including the CPUC, in May 2023 to discuss state and federal offshore wind policies. Additionally, on October 7, 2023, Governor Newsom signed AB 1373 (Garcia, 2023) which permits the state to sign long-term contracts for the purchase of electricity from offshore wind facilities. Specifically, AB 1373 provides a mechanism that allows the California Department of Water Resources (CDWR) to centrally procure long-lead time resources, such as offshore wind, upon specific findings by the CPUC that it should be procured to meet the state's growing need for cost-effective resource diversity.

On September 15, 2022, the Biden-Harris Administration announced a goal to deploy an additional 15 GW of floating offshore wind by 2035 and decrease the cost to \$45/MWh.⁹² Such a decrease would be significant given the National Renewable Lab estimated the current levelized cost of energy to be \$133/MWh.⁹³ In December 2022, Bureau of Ocean Energy Management held an offshore wind energy lease sale for areas on the Outer Continental Shelf off central and northern California resulting in five leases.⁹⁴

⁹¹ See CEC's Commission Report: *Offshore Wind Energy Development off the California Coast: Maximum Feasible Capacity and Megawatt Planning Goals for 2030 and 2045*, August 2022

⁹² [Floating Offshore Wind Shot | Department of Energy](#)

⁹³ Stehly, Tyler and Patrick Duff. 2021 Cost of Wind Energy Review

⁹⁴ [California Activities | Bureau of Ocean Energy Management \(boem.gov\)](#)

Hydrogen

On August 16, 2022, the Inflation Reduction Act of 2022 (IRA) was signed into law by President Biden, which included significant investment opportunities to develop hydrogen infrastructure and accelerate hydrogen production within the country.

In 2022, the State Legislature passed SB 1075 (Skinner, 2022). SB 1075 mandates that a comprehensive report on hydrogen be posted to CARB website by June 1, 2024. CARB is developing this report, in coordination with the CPUC, CEC, and other organizations. It will cover the deployment, development, and use of hydrogen across all sectors as a key part of achieving the State's climate, air quality, and energy goals. Additionally, in September 2022, the State Legislature enacted AB 209 (Ting, 2022), directing the CEC to provide financial incentives to demonstrate and scale-up hydrogen production, processing, delivery storage, and end-use projects in California across all sectors including RPS generation.

The CPUC supports several state agency efforts for hydrogen development and production for electric generation and long-term energy storage, provided that clean hydrogen⁹⁵ is used for electricity production.

Transmission Development Supporting RPS Implementation

SCE's West of Devers 220kV Upgrade Project

The West of Devers Upgrade was approved in D.16-08-017 (Application A.13-10-020) by the CPUC. After a lengthy California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) review in conjunction with the Bureau of Land Management, construction of this major project is complete, and on May 14, 2021 the project was fully energized. This project will allow deliverability of new renewable resources — more than 7,000 MW of renewable and battery energy storage in the coming years — from desert areas in the eastern part of California to the population centers of the Inland Empire and San Gabriel Valley.

Construction began in October 2017 and after four years the final restoration and monitoring activities were completed in the fall of 2021. The project consisted of removing and replacing conductors and supporting structures (386 lattice steel towers and 83 tubular steel poles) on four separate circuits of 220-kV transmission lines through the existing 48-mile corridor from the Devers substation near Palm Springs to the Vista and San Bernardino substations in Grand Terrace and San Bernardino, respectively — about 200 miles of power lines.

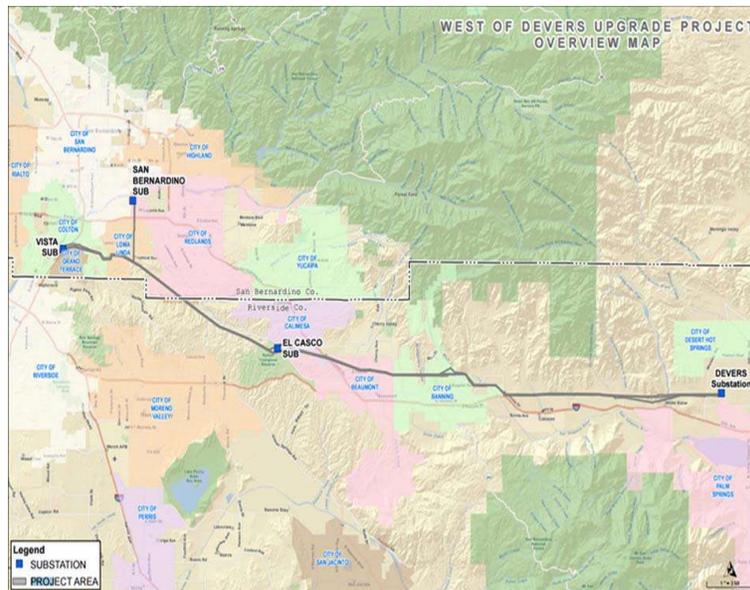
The project triples the capacity of power delivery from 1,600 MW to 4,800 MW, which helps with system reliability in Southern California population centers during peak summer demand. As part of the West of Devers Project, SCE entered into a transaction with Morongo Transmission for it to invest in the project, which allowed SCE to build the project across the Morongo Indian Reservation. The total cost of the project was \$740 million, with Morongo Transmission investing \$400 million. A conservative estimate is that the \$740 million project will likely cost ratepayers approximately \$4 billion in the long term.⁹⁶

⁹⁵ Clean hydrogen is defined as hydrogen produced from eligible renewable energy resources, as defined in the RPS program.

⁹⁶ Estimate prepared by Energy Division Staff

The project was built in an environmentally beneficial way by rebuilding within a corridor containing existing transmission lines, despite the unique operational challenges of this approach. The project spans several Riverside and San Bernardino communities, including Banning, Beaumont, Calimesa, Colton, Grand Terrace, Loma Linda, Redlands and other unincorporated areas of Riverside and San Bernardino counties. The corridor also passes through the reservation trust land of the Morongo Band of Mission Indians, a key partner with SCE in its bid to obtain environmental permits.

Commercial operation of the line began six months ahead of schedule in May 2021 and the project’s success is a testament to the commitment and dedication of all the project team members and multitude of stakeholders.



SCE’s Eldorado – Lugo – Mojave Series Capacitor Project

SCE filed an application (A.18-05-007) with the CPUC for a Certificate of Public Convenience and Necessity (CPCN) on April 19, 2019, requesting to construct the Eldorado – Lugo – Mojave (“ELM”) 500 kV Series Capacitor Project. The project had previously been approved through the CAISO’s 2013-2014 Transmission Planning Process. SCE proposes the ELM Project to deliver electricity from renewable and conventional generation resources outside of California to help meet growing electricity demand in the region, as well as to reduce greenhouse gases.

The ELM Project consists of the following major components: 1) Construct two new 500 kV mid-line series capacitors (the proposed Newberry Springs Series Capacitor and Ludlow Series Capacitor) and associated equipment; and 2) Relocate, replace, or modify existing transmission, sub-transmission, and distribution facilities at approximately 12 locations along the Eldorado-Lugo, Eldorado-Mohave, and Lugo-Mohave 500 kV Transmission Lines to address 14 potential overhead clearance discrepancies.

The CPUC approved the CPCN for the ELM Project on August 27, 2020 in D.20-08-032, with a cost cap of \$239 million (including contingency costs). Preconstruction compliance review has been completed and Notice to Proceed (NTP) #1 was issued December 14, 2020, NTP #2 was issued April 1, 2021, NTP #3

was issued May 19, 2021, and NTP #4 was issued June 8, 2021. Construction on California non-federal lands began January 2021.

On May 24, 2023 SCE filed a Petition For Modification (PFM) to its application, requesting the cost cap be increased to \$295 million (2019\$). Construction is scheduled to continue through June 2024.

Delaney Colorado River Transmission (DCRT) Ten West Link Project

The CPUC approved the Ten West Link (TWL) Project in November 2021 to increase access to out-of-state resources and lower costs to California ratepayers, primarily through production cost benefits and increase delivery of renewable generation in the Southwest. The project also provides reliability and policy benefits and congestion relief in addition to the economic benefits.

The proposed project includes installation of a 500-kV transmission line, transmission supporting structures between 72 and 190 feet in height, conductors, overhead ground wire, and a new series compensation⁹⁷ system substation. This 500-kilovolt (kV) transmission line will traverse approximately 114 miles, including a 17-mile segment in California. The portion of the proposed project in California begins at the Colorado River Substation west of the City of Blythe and runs eastward to the Colorado River near the Interstate 10 corridor in western Riverside County, California.

The proposed project will increase transmission capacity by 3,200 megawatts and provide interconnection capability for new energy projects located near the proposed project. In November 2021 the CPUC issued D.21-11-003 granting Delaney Colorado River Transmission (DCRT) a CPCN for the Ten West Link Project, with a cost cap of \$389 million (including contingency costs).⁹⁸ On June 9, 2023, DCRT made a filing with the Federal Energy Regulatory Commission (FERC) in Docket ER23-2309 requesting recovery of costs totaling \$553 million. No Petition for Modification of Decision 21-11-003 was filed with the CPUC for adjustment of costs, as required. Preconstruction compliance review has been completed and Notice to Proceed (NTP) #1 was issued December 2, 2021, and NTP #2 was issued June 1, 2022. The FERC filing anticipates a scheduled completion date of March 8, 2024.

SB 1174 (Hertzberg, 2022) – Assessment of Impacts due to Transmission and Interconnection Delays

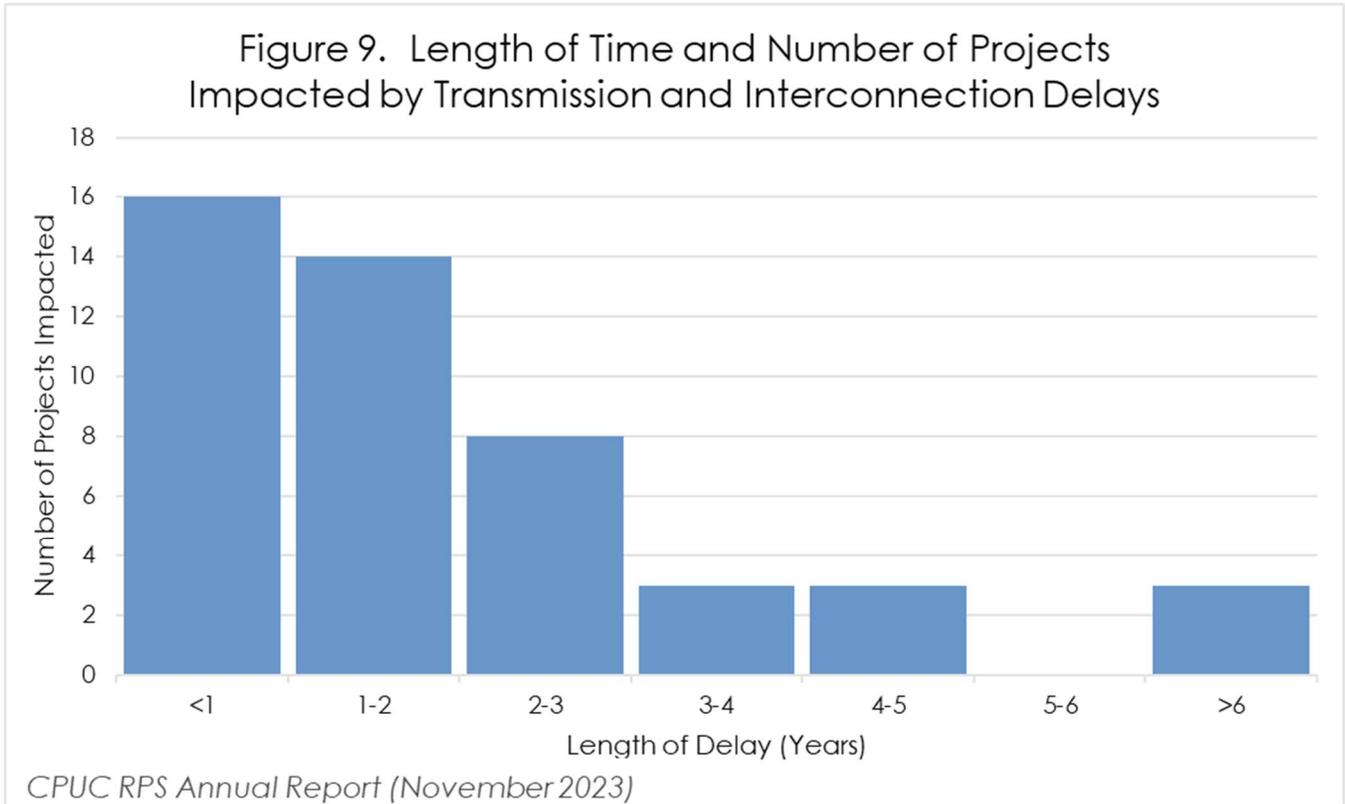
Senate Bill 1174 (Hertzberg, Stat. 2022, Ch. 229) requires electrical corporations that own transmission facilities to submit a report on any changes reported in-service dates of transmission and interconnection facilities necessary to provide transmission deliverability to eligible renewable energy resources or energy storage resources that have executed interconnection agreements.

This assessment looked at generation projects with a cost of \$1 million or more that experienced a delay in the 12-month period between June 1, 2022, and May 31, 2023, from information provided in the annual RPS procurement plans from PG&E and SCE. SDG&E indicated that they did not have any transmission or interconnection delays for this reporting period.

⁹⁷ Series compensation is the method of improving the system voltage by connecting a capacitor in series with the transmission line

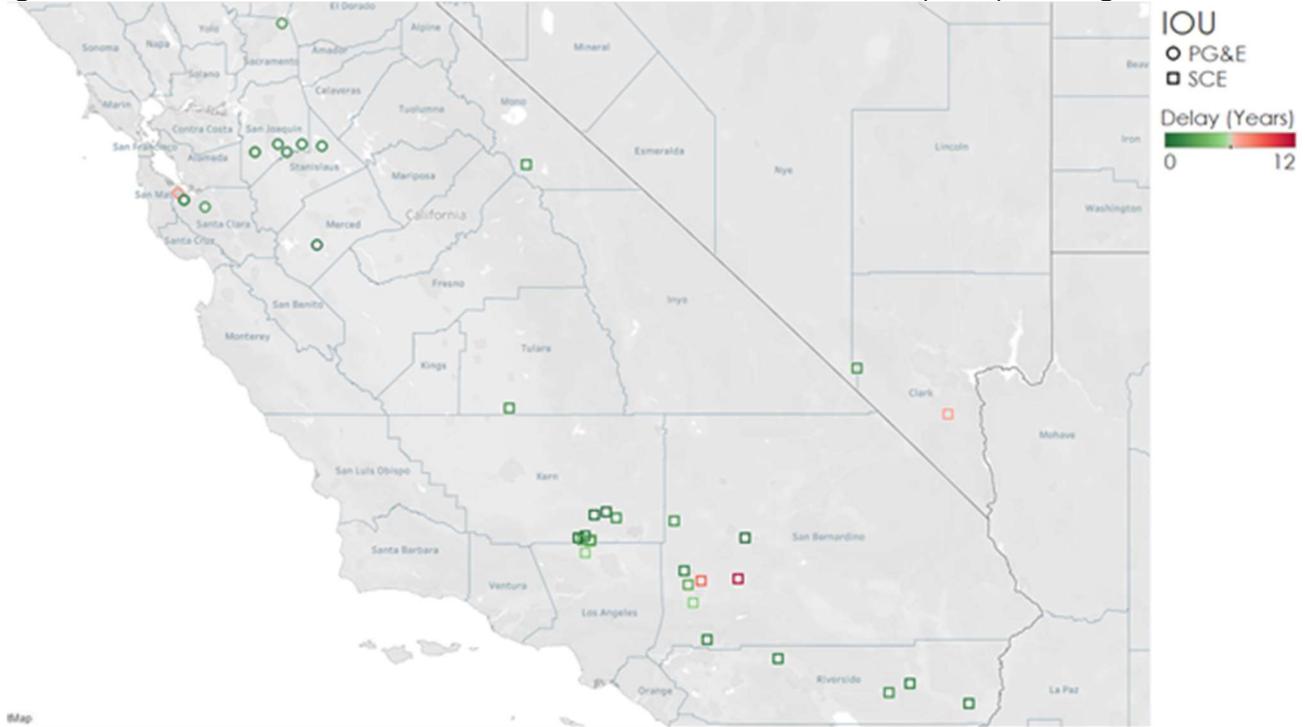
⁹⁸ Selected as a regional project in the CAISO's 2013-2014 Transmission Plan, Ten West Link, despite being mostly in Arizona, is being paid for in full by California ratepayers.

During this reporting period, the IOUs reported delays on 78 transmission and interconnection assets impacting 74 RPS facilities for up to 14,136 MW of renewable generation. Transmission and interconnection delays lasted an average of 21 months as illustrated in Figure 9.



Transmission and interconnection sites where delays impacted RPS generation are shown in Figure 10 below.

Figure 10. Location of Transmission and Interconnection Delays Impacting RPS Facilities

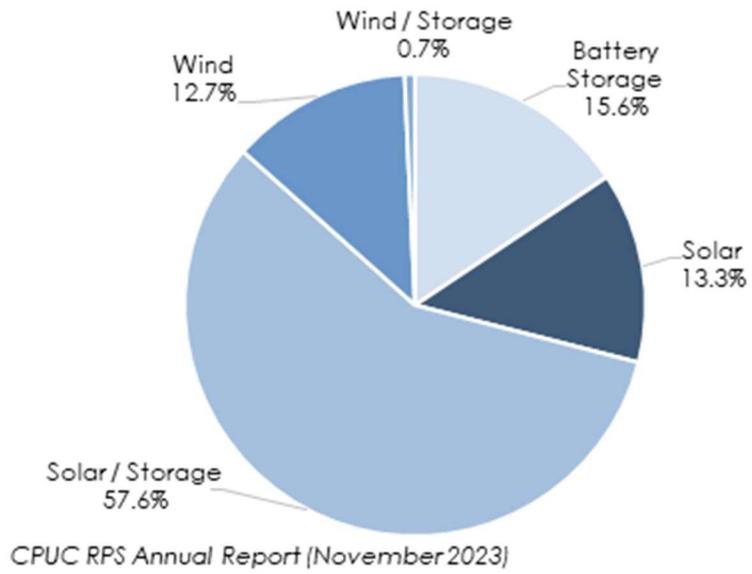


Reasons given for these delays can be categorized into the following five causes:

1. Customer Delays
2. Reprioritization
3. Project Dependency
4. Schedule Evolution
5. Land Acquisition/Permitting

Facilities with energy storage, standalone or hybrid, make up 73.9 percent of the impacted projects. RPS-generation impacted by these delays is broken down by technology type in Figure 11 below.

Figure 11. Technology Type of Projects Impacted by Transmission and Interconnection Delays



RPS Workforce Development and Diversity

This chapter describes RPS workforce development activities of the IOUs, SMJUs, CCAs, and some of the ESPs, consistent with Public Utilities Code 913.4(f).⁹⁹ The state requires collection of this information to ensure an adequately trained and available workforce can support California’s increasing dependence on advanced renewable energy technologies. The sections below provide data and trends on workforce development related to retail sellers’ current RPS workforce, diversity of staff, strategies used to proactively recruit and train their staff to support California’s ambitious goals for reliable, clean energy. To provide this overview, the CPUC collected information on workforce development data directly from the IOUs, SMJUs, CCAs and ESPs.

IOU Workforce Development

The IOUs report having a significant focus on offering equal employment opportunities with respect to the recruitment, hiring, and professional development practices associated with the implementation of the RPS program.

Current IOU RPS Workforce

Table 2 and Figure 12 provide an overview of the number of full-time PG&E, SCE, and SDG&E employees who worked on RPS-related issues from 2014 – 2023. In total, the three IOUs reported a cumulative increase in total employees working on RPS issues from 172 to 228 in the past year.

Table 23: Total RPS Employees at Large Investor-Owned Utilities (2014-2023)										
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Totals	190	206	161	169	135	302	271	307	172	228

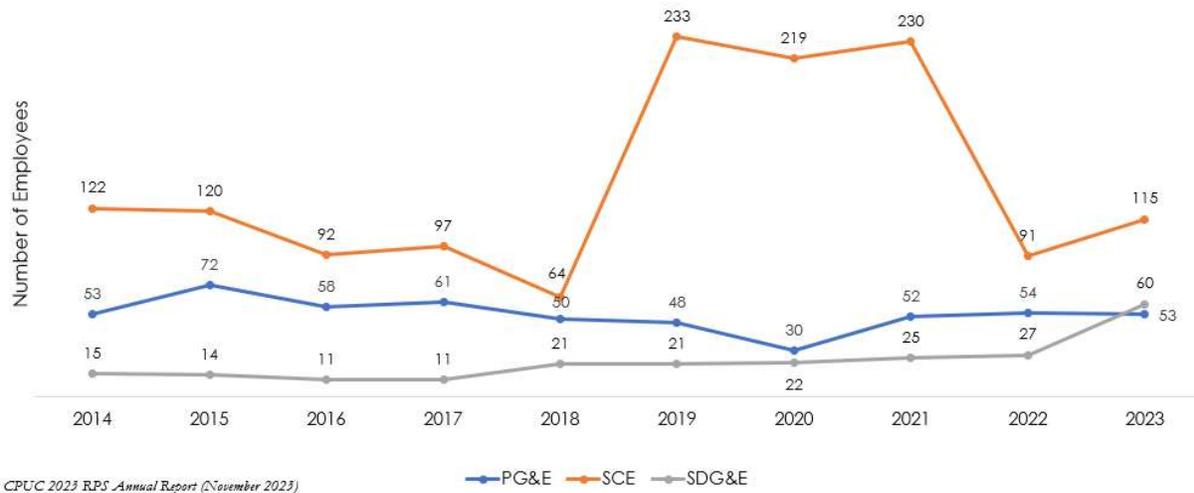
Data Source: PG&E, SCE, SDG&E, September 2023

Figure 9 illustrates how the number of RPS employees the three large IOUs has changed over the past eleven years.¹⁰⁰

⁹⁹ Public Utilities Code § 913.4(f) applies to retail sellers and the reporting in this chapter does not reflect the workforce development and diversity efforts of renewables project developers. Only half of the ESPs responded to the data request that this chapter is based on.

¹⁰⁰ This time series data is current as of August 2022 and includes employment data from January 2013 through July 2022.

Figure 12: Full-Time RPS Employees at Large Investor-Owned Utilities (2014-2023)



Data Source: PG&E, SCE, SDG&E, September 2023

Current IOU RPS Workforce Diversity

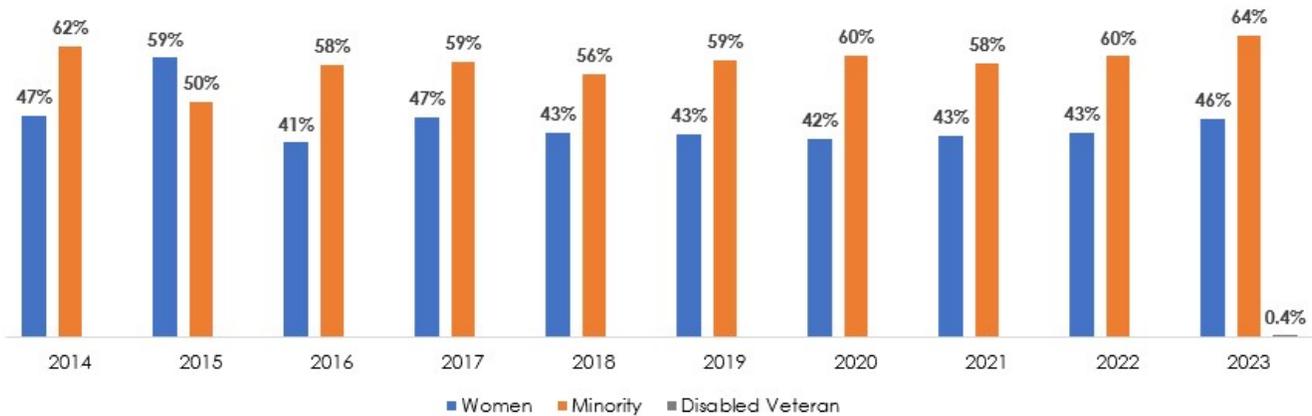
Each of the IOUs reported having company-wide diversity goals to build a workforce that reflects the diversity of the State of California. Common diversity efforts across the IOUs include providing equal employment opportunities in all aspects of their employment practices and hiring more women, minorities, and disabled veterans to implement the RPS program. In 2023, two out of the three large IOUs reported working with organizations that focus on professional development for women, minorities, and disabled veterans.¹⁰¹

Figure 13 illustrates aggregated data on the percentage of women, minorities, and disabled veterans who are full-time employees who work on the RPS program at the three large IOUs.¹⁰²

¹⁰¹ General Order 156 refers to the rules governing the development of programs to increase participation of women, minority, disabled veterans, and LGBT business enterprises in procurement contracts from IOUs as required by Public Utilities Code §§ 8281-8286. The IOUs are compliant with General Order 156 requirements on Supplier Diversity. <https://www.cpuc.ca.gov/supplierdiversity/>.

¹⁰² The value displayed for the total number of RPS employees is based on the percentage of time employees spend working on RPS issues (a range of 0 to 100 percent). Employees may fall into multiple categories (i.e., both minority female or female disabled veterans) and their time may be distributed between the RPS program and other non-RPS functions.

Figure 13: Percentage Women, Minority, and Disabled Veteran Employees at Large Investor-Owned Utilities (2014-2023)



CPUC 2023 RPS Annual Report (November 2023)

Data Sources: PG&E, SCE, SDG&E, September 2023

PACIFIC GAS AND ELECTRIC (PG&E):

Table 25 shows the percentages of PG&E’s RPS employees who are women, minorities, and disabled veterans compared with total PG&E RPS staff. In 2023, PG&E’s RPS staff was comprised of 38 percent women and 57 percent minority staff members. The percentage of women in PG&E’s RPS workforce is 12 percentage points higher than the national average for women in the energy workforce.¹⁰³

Table 24: Pacific Gas and Electric’s Percentage of Women, Minority, and Disabled Veteran RPS Employees from 2014–2023

	RPS Employees									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Women	38%	50%	22%	44%	43%	42%	35%	21%	35%	38%
Minority	66%	44%	48%	48%	47%	55%	60%	33%	52%	57%
Veterans¹⁰⁴	4%	3%	3%	0%	4%	n/a	n/a	n/a	n/a	n/a
Total RPS Staff	53	72	58	61	50	48	30	52	54	53

Data on the ethnic and racial backgrounds of PG&E RPS employees for 2019-2023 is displayed below in Table 25.

¹⁰³ Data source: Department of Energy (DOE) Energy and Employment Report, 2023.

Table 25: Pacific Gas and Electric's Ethnic and Racial Background of RPS Employees from 2019–2023

	RPS Employees					Energy Workforce Average*
	2019	2020	2021	2022	2023	2023
American Indian or Alaskan Native	0%	0%	0%	0%	0%	2%
Asian	42%	47%	35%	37%	39%	7%
Black/African American	2%	0%	0%	2%	2%	9%
Hispanic/Latino	8%	10%	12%	11%	13%	18%
Native Hawaiian or Pacific Islander	0%	0%	0%	0%	0%	1%
Two or more races	4%	3%	3%	2%	4%	5%
White	44%	40%	50%	48%	43%	75%
Other	0%	0%	0%	0%	0%	<1%

* Data Source: DOE Energy and Employment Report, 2023

SOUTHERN CALIFORNIA EDISON (SCE):

Table 26 illustrates the percentage of SCE’s RPS employees who are women, minorities, or disabled veterans. The value displayed for the total number of RPS staff is based on the percentage of time employees spend working on RPS issues (a range of 0 to 100 percent). However, the counts of women, minorities, and ethnic and racial backgrounds are unique counts not based on the percentage of time employees spend working on RPS issues. The percentage of women in SCE’s RPS workforce is 22 percentage points higher than the national average for women in the energy workforce.¹⁰⁴

Table 26: Southern California Edison's Percentage of Women, Minority, and Disabled Veteran RPS Employees from 2019–2023

	RPS Employees				
	2019	2020	2021	2022	2023
Women	42%	43%	44%	46%	48%
Minority	60%	60%	60%	63%	68%
Disabled Veterans	No Data			<1%	
Total RPS Staff	233	219	230	91 ¹⁰⁶	115

The ethnic and racial backgrounds of SCE’s RPS employees are displayed below.

¹⁰⁴ Data source: Department of Energy (DOE) Energy and Employment Report, 2023.

Table 27: Southern California Edison’s Ethnic and Racial Background of RPS Employees from 2019–2023						
	RPS Employees					Energy Workforce Average
	2019	2020	2021	2022	2023	2023
American Indian or Alaskan Native	0%	0%	0%	0%	0%	2%
Asian	33%	33%	33%	32%	36%	7%
Black/African American	7%	6%	6%	5%	6%	9%
Hispanic/Latino	17%	18%	17%	21%	20%	18%
Native Hawaiian or Pacific Islander	1%	1%	1%	0%	0%	1%
Two or more races	2%	3%	3%	4%	5%	5%
White	40%	40%	40%	37%	32%	75%
Other	0%	0%	0%	0%	0%	<1%

SAN DIEGO GAS & ELECTRIC COMPANY (SDG&E):

Table 28 illustrates the number of SDG&E’s RPS employees who are women, minorities, or disabled veterans. In 2023, SDG&E’s RPS staff was comprised of 48 percent women and 68 percent minority staff members. The percentage of women in SDG&E’s RPS workforce is equal the national average for women in the energy workforce.¹⁰⁵

Table 28: San Diego Gas & Electric’s Percentage of Women, Minority, and Disabled Veterans RPS Employees from 2014–2023										
	RPS Employees (Full-Time)									
	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Women	12	15	13	14	10	11	10	11	11	29
Minority	7	11	11	11	12	11	10	12	13	32
Disabled Veterans	No Data				2 ¹⁰⁶	n/a	0	0	0	0
Total RPS Staff	15	14	11	12	21	21	22	25	27	60

The ethnic and racial background of SDG&E’s RPS employees is shown below.

¹⁰⁵ Data source: Department of Energy (DOE) Energy and Employment Report, 2023.

¹⁰⁶ SDG&E reported disabled veterans for the 2018 California RPS Annual Report but excluded these data points in their 2019 workforce development reporting.

Table 29: San Diego Gas & Electric's Ethnic and Racial Background of RPS Employees from 2019–2023

	RPS Employees (Full-Time)					Energy Workforce Average
	2019	2020	2021	2022	2023	2023
American Indian or Alaskan Native	0%	0%	0%	0%	0%	2%
Asian	10%	5%	8%	11%	17%	7%
Black/African American	14%	14%	8%	7%	8%	9%
Hispanic/Latino	24%	32%	32%	26%	15%	18%
Native Hawaiian or Pacific Islander	0%	0%	0%	0%	2%	1%
Two or more races	5%	5%	0%	4%	12%	5%
White	48%	45%	52%	52%	47%	75%
Other	0%	0%	0%	0%	0%	<1%

Recruiting Strategies

Recruiting efforts at each of the IOUs tend to utilize both broad candidate outreach and targeted strategies to recruit diverse candidates. In addition, the utilities also offer programs that can act as training and recruitment of future employees, including long-term efforts within California’s school systems.

PG&E

Recruitment Marketing, Social Media, Recruitment Tools and Resources

PG&E does not have specific hiring goals for the RPS program; however, PG&E has a Talent Acquisition (TA) team which aligns its practices with the Office of Federal Contract Compliance Programs (OFCCP) for affirmative action plans to ensure a diverse workforce to achieve equal employment opportunity. All open positions, where PG&E is hiring external candidates, are shared with the following organizations and entities: Cal Jobs + local Veteran employment reps, DiversityJobs.com (which include Women, Veterans, LGBTQIA, AAPI, Native & Indigenous People, Hispanic/LatinX, African American/Black, Individuals with Disabilities (IWD), Older Workers sites), LinkedIn, Job boards through Radancy's Programmatic Job AI (including Indeed, ZipRecruiter, Dice), Center for Energy Workforce Development (CEWD). Additionally, for positions with an affirmative action plan goal for women or minorities, PG&E posts with the following local organizations: Sacramento Hispanic Chamber of Commerce, Sacramento LGBT Community Center, Folsom Cordova Job Center, Rubicon Programs, SF Women Center, Oakland LGBTW Community Center, Upwardly Global, Concord Chamber of Commerce, Fresno Metro Black Chamber of Commerce.

Diverse Employee Recruitment

To ensure inclusivity and a diverse workforce, PG&E communicates open positions, dependent on job type, with the following free and paid job boards: Navy Bases (TAP), California Women in Energy, Energy Folks, Women in Trade (Tradeswomen), Utility Arborist Association, California Conservation Corps, California Licensed Foresters Association, Traverse Jobs, Society of Women Engineers, Society of Hispanic Professional Engineers, National Society of Black Engineers, Institute of Electric and Electronic Engineers,

Institute of Industrial & Systems Engineers, American Gas Association, American Planning Association, American Society of Civil Engineers, American Society for Quality, American Society of Safety Professionals, The Hill. Additionally, PG&E established a partnership with VetJobs, whereby a dedicated recruiter connects transitioning service members, as well as veterans and spouses to positions with PG&E. And lastly, PG&E attends a number of career fairs throughout the year focusing on outreach to Veterans and individuals with disabilities.

SCE

Recruitment

SCE's recruitment outreach generally includes the following categories:

- Recruitment Marketing, Social Media, Recruitment Tools and Resources
- Professional and Community Association Outreach
- Military Veteran Outreach
- Individuals with Disabilities Outreach
- University & Campus Relations
- Internal Business Resource Group (BRG) Partnerships

Recruitment Marketing, Social Media, Recruitment Tools and Resources

SCE's career site includes targeted pages focusing on women, individuals with disabilities, military veterans, diversity & inclusion, early career, and critical positions like data scientist, cybersecurity, continuous improvement, environmental policy, planning, skilled trades, engineering, and IT. Their career site is also fully mobile and accessible to individuals with disabilities. Visitors on the site and other channels are invited to join the SCE Talent Network that allows active and future job seekers to stay connected and updated on company news, events and job opportunities.

SCE also shares and promotes jobs and content on major social and job sites such as LinkedIn, Glassdoor, and Indeed for maximum visibility. Content developed and shared across our major channels is focused on company initiatives, storytelling and featuring employees across the organization with different backgrounds. To help the job opportunities and content reach particular demographics, they use targeted paid advertisements through LinkedIn, Facebook, Indeed, Glassdoor, and Instagram.

To assist SCE with meeting federal contractor job posting requirements, they have partnered with Direct Employers to promote their jobs. To help with female recruitment outreach, SCE has been a member of Fairygodboss, the largest career community for women. SCE uses SmashFly, a talent marketing platform that combines CRM, career site, and programmatic advertising. SmashFly helps with automating our high-volume tasks and allows the company to connect with candidates at any time. SmashFly can also help with measuring the return on their recruitment marketing spend.

The augmented writing platform, Textio, is used by recruiters and hiring leaders to help SCE with writing inclusive and compelling job descriptions.

Professional and Community Association Outreach

SCE employees are active and continue to partner with several professional and community groups.

Their participation includes attending their career related events, being on-podium (keynote) at their annual conferences and mentoring their early-career members. Some of the professional and community associations include the following:

- Society of Women Engineers (SWE)
- Society of Hispanic Professional Engineers (SHPE)
- National Society of Black Engineers (NSBE)
- Asian American Professional Association (AAPA)
- American Association of Blacks in Energy (AABE)
- Native American Tribes, specifically the 13 tribes within the SCE service territory
- Disability:IN
- New Horizons
- Trans Can Work
- Foundation for Women Warriors
- LA LGBT Center
- Paradigm for Parity Coalition
- Catalyst
- Direct Employers
- Association of Women in Water, Energy and Environment (AWWEE)
- OUTLeadership

Additionally, SCE has 12 Business Resource Groups which are actively involved with many community organizations and have formed lasting relationships with members of these organizations to advance diversity, equity, and inclusion throughout their service territory.

Military Veteran Outreach

SCE states that it is committed to hiring and supporting military veterans. Some of its recruitment outreach and strategies to the veteran communities include the following:

- Hosting company information sessions for active military and veterans.
- Maintaining a military/veteran page on their career site which includes a military translator tool through Recruit Rooster. The translator tool allows job seekers to identify which careers at SCE are a good match with their military background.
- Leveraging VALOR, SCE’s veteran Business Resource Group to help the company engage and stay connected with the veteran community.

Individuals with Disabilities

SCE is a member of the U.S. business leadership network, Disability:IN, which is the leading nonprofit resource for business disability inclusion worldwide. Employees from various parts of the company are active members of this network and attend their annual conference to remain current on how companies can best attract and retain individuals with disabilities and strengthen their inclusive culture. In addition, SCE employees continue to conduct information sessions at non-profits such as the Salvation Army Rehabilitation facility to provide participants insight to career paths at SCE. They partnered with Springboard Consulting to host a cross-company conversation on recruitment, retention, compliance, and accessibility best practices through “Leaders 4Disability” to identify areas of focus in their disability inclusion initiatives.

University & Campus Relations

SCE's college recruitment efforts are generally targeted to students pursuing degrees in engineering, accounting, finance, information technology, and cyber security at mostly California-based universities and colleges. The company also developed a leadership development program for MBA graduates from select schools.

In addition, SCE partners with organizations such as TELACU (The East Los Angeles Community Union), GMiS (Great Minds in STEM), and MESA (Mathematics Engineering Science Achievement) to help with attracting a diverse group of early career talent.

The Company promotes all early-career job opportunities at most Historically Black Colleges and Universities (HBCU) through Handshake. Handshake is a recognized platform for college students and alumni to find job opportunities. In addition, SCE currently has strategic relationships with two HBCUs, which includes virtual recruiting activities and outreach, such as company information sessions. Over 10 of SCE's target universities are designated as Hispanic Serving Institutions (HSI). Additionally, SCE has initiated strategic partnership with Howard University (HBCU) and provides scholarships to students in the National Society of Black Engineers.

Since 2017, SCE has worked with Cal Poly Pomona's Open University to help prepare students for careers in utility planning. Several instructors for Cal Poly Pomona's Energy Planner Certification are SCE employees.

As part of its Line worker Scholarship Program, Edison International developed a four-year, \$1-million pilot scholarship program in 2021 to provide scholarships and additional support totaling up to \$25,000 per recipient. The purpose of this scholarship program is to increase Black representation in the line worker role. Scholarship recipients will eventually enroll in an applicable program at Los Angeles Trade Tech College (LATTC). In 2023, the program expanded the representation efforts to include Black, Asian Pacific Islander, Native American, or female. SCE has since hired four graduates from Line worker Scholarship Cohort 1 in 2022 and five more graduates in 2023. Also in 2023, one graduate was hired from Cohort 2 and 12 scholarship recipients were identified for Cohort 3.

Company Business Resource Group Partnerships

SCE's Talent Acquisition partners with the company BRGs on outreach activities, specifically on job preparation strategies. Some examples include the following:

- Through the Networkers BRG, the Black Male Initiative was formed to partner with community, spiritual and non-profit organizations to help promote SCE job opportunities and career paths to members of their organizations.
- In partnership with the Business Resource Group, Latinos Engagement Advancement and Development (LEAD), Talent Acquisition presented to Latino student and community groups on resume writing best practices and interview preparation.
- SCE employees worked with the Native American Alliance Business Resource Group and representatives from other companies to host a virtual career expo to the members of the 13 tribes within SCE's service territory. Attendees were able to hear about job opportunities and practical advice about how to best prepare for their next job.

Training

Energy Procurement and Management (EPM) has implemented several continuous improvement initiatives focused on creating employee development and training programs. Internal training opportunities cover topics such as SCE’s renewable procurement programs, including large-scale RPS solicitations and small-scale RPS procurement programs (e.g., feed-in tariffs, RAM, etc.). These training sessions range from subject matter-specific to more general overviews using a wide-range of forums comprising of formal cross-training options, webinars, bidders conferences, RPS pro forma technical review sessions (when contracting for such resources), and more informal methods such as brown bag sessions, overview trainings, regulatory updates, lessons learned meetings, and RPS solicitation kick-off meetings (when soliciting for such resources).

SDG&E

General Outreach

SDG&E has a stated commitment to diversity and inclusion. Their recruiting program includes posting job opportunities on various job boards such as Association of Women in Water, Energy and Environmental (AWWEE), Circa, DiversityJob.com, Indeed, NativeHire.org and Pink Jobs, and also utilizes social media outlets such as LinkedIn, Instagram, Facebook and YouTube to provide company information and advertise openings.

Diverse Employee Recruitment

As part of its recruiting program, SDG&E partners with diverse organizations including American Association of Blacks in Energy (AABE), American Indian Science and Engineering Society (AISES), National Association of Women in Construction (NAWIC), National Association of Asian American Professionals of San Diego (NAAAP), National Society of Black Engineers (NSBE), San Diego Committee on Employment for People with disABILITIES, Society of Women Engineers (SWE), and Women in Technology International (WITI). SDG&E’s recruitment staff also focus on military outreach and work with organizations such Employment Development Department (EDD), Hire GI, and Recruit Military, and support programs such as San Diego’s Competitive Edge, and the San Diego Workforce Partnership’s (SDWP) Career Jumpstart.

SDG&E's partnership includes providing funding, attending events and hiring participants, posting job opportunities on their websites, helping them to expand their membership and collaborating with them on events by facilitating workshops and serving as panels.

University Outreach

Candidates for SDG&E internship and associate rotation programs are recruited from several schools in California, as well as Historically Black Colleges and Universities across the country such as Howard University, Norfolk State University, and Prairie View A&M. These schools are chosen due to their academic excellence and focused disciplines, such as offering Electrical Engineer power programs.

SDG&E has structured internship and rotation programs for engineering, accounting & finance, and information technology. Each program rotates employees through a series of company departments as development opportunities and exposure to various parts of the organization. Additionally, programs include the following components:

- Mentoring by management and director level leaders
- Work experience, field trips, lunch & learns, and social activities

- Participation by school professors
- University Advisory Board membership by many leaders to influence curriculum
- Program management by leadership, typically directors, to monitor development
- Maintaining relationships with diverse student organizations, such as Mathematics Engineering Science Achievement (MESA), National Association of Black Accountants (NABA), Society of Asian Scientists and Engineers (SASE), Society of Hispanic Professional Engineers (SHPE), etc.

SMJU Workforce Development

Given the smaller size of the three SMJUs’ (BVES, Liberty, PacifiCorp) RPS staff, they have fewer resources dedicated to RPS workforce development compared to the IOUs.

	2017	2018	2019	2020	2021	2022	2023
BVES	11	13	3	3	3	3	3
Liberty	9	11	13	12	12	9	No Data
PacifiCorp	No Data						
Totals	20	24	16	15	15	12	3

Data source: BVES, September 2023

BVES, Liberty, and PacifiCorp did not submit data on the number of women, minorities, or disabled veterans this annual report cycle.

Bear Valley Electric Service (BVES):

The ethnic and racial background of BVES’ RPS employees is shown in the table below.

	RPS Employees (Full-Time)				Energy Workforce Average
	2020	2021	2022	2023	2023
American Indian or Alaskan Native	0%	0%	0%	0%	2%
Asian	33%	33%	33%	0%	7%
Black/African American	0%	0%	0%	0%	9%
Hispanic/Latino	0%	0%	0%	0%	18%
Native Hawaiian or Pacific Islander	0%	0%	0%	0%	1%
Two or more races	0%	0%	0%	0%	5%
White	67%	67%	67%	100%	75%
Other	0%	0%	0%	0%	<1%

BVES has a supplier diversity program to measure organizational diversity and inclusion. BVES has not engaged in college recruitment efforts or offered scholarships to students within its service territory. The utility does not conduct internal training courses, but RPS employees are encouraged to attend training and workshops elsewhere in the State.

Liberty Utilities

The ethnic and racial backgrounds of Liberty Utilities’ RPS employees are shown below.

Table 32: Liberty Utilities’ Ethnic and Racial Background of RPS Employees from 2020–2023				
	RPS Employees (Full-Time)			
	2020	2021	2022	2023
American Indian or Alaskan Native	0%	0%	0%	No Data
Asian	8%	17%	22%	No Data
Black/African American	17%	8%	11%	No Data
Hispanic/Latino	0%	8%	11%	No Data
Native Hawaiian or Pacific Islander	0%	0%	0%	No Data
Two or more races	0%	0%	0%	No Data
White	75%	67%	56%	No Data
Other	0%	0%	0%	No Data

Liberty Utilities formed a Diversity and Inclusion Council in early 2019 comprised of representatives from all its regions and intended to set up the framework and activities to enable inclusion across the company. In addition, Liberty Utilities conducted an all-employee Diversity and Inclusion training in 2022. Liberty states that it is an equal opportunity employer and is committed to ensuring an equal and diverse workforce to implement the RPS program.

And lastly, Liberty offers seven scholarships to graduating high school students within the service territory and offers one annual community college scholarship.

PacifiCorp

PacifiCorp has policies to support diversity and inclusion, including a diversity, equity and inclusion task force, but these are corporate-wide, and PacifiCorp does not implement workforce development programs related to recruitment, training, and retention of WMDV employees specific to California’s RPS program. PacifiCorp currently employs a small number of individuals to work on RPS issues for all states, with assistance from additional staff in environmental policy, regulation, and legal work on RPS-related matters, but their time is not tracked by issue or state, and PacifiCorp did not provide specific diversity statistics.

CCA Workforce Development

The CPUC requested data from all CCAs. The CCAs generally report that they implement workforce development and diversity policies to build a workforce that promotes economic sustainability and inclusion in the renewable energy sector. Common diversity efforts across the CCAs include providing equal

employment opportunities in their employment practices, fair compensation, quality training and apprenticeship programs, and the development of locally based jobs.

Table 33 shows the amount of total full-time RPS employees at each CCA in response to the CPUC’s data request.¹⁰⁷

Table 33: Total Number of CCA RPS Employees (2019 – 2023)					
	2019	2020	2021	2022	2023
Apple Valley Choice Energy	2	2	0	2	0
Central Coast Community Energy	4	5	No Data	5	8
City of Commerce	No Data	No Data	No Data	No Data	0
City of Palmdale	No Data	No Data	No Data	No Data	1
City of Pomona	-	0	0	1	1
City of Santa Barbara	-	-	No Data	No Data	2
Clean Energy Alliance	-	-	No Data	1	1
Clean Power Alliance	5	6	7	8	No Data
CleanPowerSF	5	11	11	11	13
Desert Community Energy	-	-	No Data	3	4
East Bay Community Energy	3	2	No Data	2	3
King City Community Power	3	3	3	No Data	0
Lancaster Choice Energy	1	1	2	2	3
Marin Clean Energy	73	72	72	86	106
Orange County Power Authority	-	-	No Data	No Data	No Data
Peninsula Clean Energy	4	4	No Data	5	8
Pico Rivera Innovative Municipal Energy	0	0	0	2	0
Pioneer Community Energy	No Data	No Data	No Data	3	3
Rancho Mirage Energy Authority	1	1	1	1	1
Redwood Coast Energy Authority	7	8	8	10	5
San Diego Community Power	-	-	6	6	8
San Jacinto Power	0	0	0	0	0
San Jose Clean Energy	8	12	No Data	12	17
Silicon Valley Clean Energy	2	2	No Data	10	12
Sonoma Clean Power Authority	6	9	No Data	11	9
Valley Clean Energy Alliance	0	2	2	2	1

Data Source: CCAs, September 2023

In 2023, the CCAs reported engaging in business and workforce initiatives due to increased RPS operations. Table 34 illustrates aggregated data on the percentage of women, minorities, and disabled veterans who are full time employees at the CCAs who work on the RPS program. The average percentage of women across the CCAs’ RPS workforce is 26 percentage points higher than the national average for women in the energy workforce.¹⁰⁸

¹⁰⁷ The CCAs have varying interpretations of the data request categories and, therefore, reported RPS employees may not be directly comparable across the CCAs and the IOUs.

¹⁰⁸ Data source: Department of Energy (DOE) Energy and Employment Report, 2023.

	2019	2020	2021	2022	2023
Women	51%	56%	58%	54%	50%
Minority	23%	29%	33%	43%	36%
Disabled Veterans	No Data	No Data	No Data	0%	0%

Data Source: CCAs, September 2023

The ethnic and racial backgrounds of the CCAs’ RPS employees are shown in Table 35 below.

	RPS Employees	Energy Workforce Average
	2023	2023
American Indian or Alaskan Native	1%	2%
Asian	15%	7%
Black/African American	7%	9%
Hispanic/Latino	13%	18%
Native Hawaiian or Pacific Islander	2%	1%
Two or more races	5%	5%
White	45%	75%
Other	12%	<1%

Data Source: CCAs, September 2023

ESP Workforce Development

The CPUC requested data from all ESPs that were operational in 2023. The ESPs that responded generally report that they implement workforce development and diversity policies to build a workforce that promotes diversity and inclusion in the renewable energy sector. Common diversity efforts across the ESPs include providing equal employment opportunities in their employment practices and quality training and apprenticeship programs.

Table 36 shows the amount of total full-time RPS employees at each ESP in response to the CPUC’s data request.¹⁰⁹

¹⁰⁹ The ESPs have varying interpretations of the data request categories and, therefore, reported RPS employees may not be directly comparable.

Table 36: Total Number of ESP RPS Employees (2019 – 2023)

	2019	2020	2021	2022	2023
3 Phases Renewables	8	9	No Data	No Data	8
Brookfield Renewable Energy Marketing U.S.	-	-	-	-	No Data
Calpine Energy Solutions	No Data	No Data	13	15	No Data
Constellation NewEnergy	No Data	No Data	No Data	26	40
Commercial Energy of Montana, Inc. (dba Commercial Energy of CA)	-	-	-	-	0
Calpine PowerAmerica	No Data	No Data	5	5	No Data
Direct Energy Business	No Data	No Data	No Data	10	10
BP Energy Retail	No Data				
EnerCal USA, LLC (dba Yep Energy, Y.E.P.)	No Data				
Gexa Energy	No Data				
Just Energy Solutions	5	6	No Data	5	4
Liberty Power Delaware	No Data				
Liberty Power Holdings	No Data				
Palmco Power	No Data	No Data	No Data	No Data	0
Pilot Power Group	0	0	3	3	2
Praxair Plainfield	No Data				
Shell Energy North America	No Data				
Tenaska Power	No Data				
Tiger Natural Gas	No Data				
UC Regents	2	2	2	3	4

Data Source: ESPs, September 2023

RPS Challenges and Policy Recommendations

Public Utilities Code § 913.4 requires the CPUC to identify barriers to achieving the RPS requirements and to propose recommendations to address those barriers. This chapter examines a few RPS program challenges at a high level and describes actions the CPUC is taking to address these issues, as well as offers recommendations for future actions.

The challenges addressed in this chapter include:

Challenge 1: Bioenergy: High hazard zone fuel use, climate change goals, and emerging trends

Challenge 2: Project Development Delays

Challenge 3: Interconnection Demand

Challenge 1: Bioenergy

ISSUES

The state looks to effective bioenergy programs to play additional contributing roles in addressing waste reduction, waste diversion, and mitigation of wildfire risks. Although bioenergy is a comparatively expensive renewable resource, State biomass waste management policies have been expanded in recent years with new urban organic waste diversion mandates and increased restrictions on open burning of biogenic agricultural waste. Within the RPS program, there are two bioenergy procurement programs: the Bioenergy Renewable Auction Mechanism (BioRAM) and Bioenergy Market Adjusting Tariff (BioMAT) which assist in meeting these state policies. The CPUC has implemented numerous revisions to its bioenergy programs to further meet these policies trends. Future policies or program changes may occur as bioenergy technologies are considered RPS-eligible and may contribute to achieving California’s SB 100 goals for zero-carbon resources by 2045. However, data for the programs, research, and emerging trends should be considered when considering any future changes.

Underutilization of fuel from Biomass High Hazard Zones

The BioRAM program requires the large IOUs to procure 146 MWs of bioenergy from facilities that use High Hazard Zone (HHZ) fuel, as defined by CAL FIRE, to aid in mitigating the risk of wildfires. By sourcing HHZ fuel stock, the BioRAM program is intended to provide a waste disposal solution for dead or dying trees that present increased wildfire risk in HHZs. However, the potential of the BioRAM to aid in mitigating wildfire risk and support sustainable forest management appears to remain unfulfilled. For the 2022 reporting period, BioRAM HHZ fuel reports submitted by the IOUs to the CPUC show that of the seven contracted IOU BioRAM facilities, only three facilities met the HHZ fuel use requirement for the entire year.¹¹⁰ One facility opted out for only one month, and another facility opted out for three months. The remaining two facilities opted out for five months and seven months, respectively. Although it is unclear precisely why each facility opted out or did not otherwise meet its fuel use requirements, CPUC staff analysis suggests that insufficient supply chain capacity, fuel supply costs (including significantly

¹¹⁰ Senate Bill 901 (Dodd, 2018), which was implemented in CPUC Resolution E-4977, modified the BioRAM program, in part, to permit BioRAM facilities to opt out of HHZ requirements.

increased hauling and processing costs), and inconsistent fuel supplies can be barriers to accessing reliable, cost-efficient biomass fuel stock from HHZs.

RECOMMENDATION

The CPUC will continue to track the amount of fuel used at bioenergy facilities that is sourced from high fire risk areas, as well as the total costs of fuel and energy procurement, to further understand both bioenergy cost-effectiveness and general efficacy of the BioRAM program. Additionally, the CPUC will continue to explore other incentives and penalties that might increase HHZ fuel use at BioRAM facilities in order to maximize their existing potential to aid in reducing wildfire risk and support sustainable forest management goals. For example, the CPUC could consider an alternate contract pricing mechanism for those months when a bioenergy facility opts out of using HHZ fuel stock for any contract extensions.

Bioenergy’s contribution towards California’s climate policies and goals will require ongoing research

At the regional SB 100 scoping workshops held across the state, stakeholders asked that the definition of “zero-carbon resource” continue to include electricity generated from bioenergy fuel sources. Many stakeholders commented that bioenergy can also contribute meaningfully to the state’s system reliability, waste diversion, and wildfire risk reduction goals. Yet, other stakeholders in California view bioenergy differently. This diversity of opinion about bioenergy is reflective of the wide range of typologies broadly grouped into the “bioenergy” category. For example, while the BioRAM program is centered on larger generation facilities typically utilizing older combustion technologies to convert forest waste and/or mill-derived feedstocks, the BioMAT program is focused on conversion of smaller, more diverse organic waste streams - such as diverted food wastes, animal manure, and agricultural crop by-products - that largely results in biogas to electricity production. When assessing this wide range of bioenergy programs, many acknowledge significant upside potential to reach RPS program goals, while other stakeholders continue to maintain concerns about the effects of bioenergy generation on regional air quality and local land use impacts.¹¹¹

Unlike other RPS generation categories, there is no singular meaning of the term bioenergy within which to simplify or unify broad stakeholder inputs. The RPS bioenergy program and policy discussion is highly nuanced. Consequently, a complete understanding of the contributions the full range of bioenergy projects could make towards statewide GHG reductions goals will need continuous updating and re-evaluation as new biofuel conversion technologies are adopted and new biofuel markets are developed. In recent years, California has been trending away from combustion technologies more common at legacy bioenergy facilities and towards more emission-efficient gasification and pyrolysis projects in all biofuels production submarkets. Ongoing applied research analyzing the emissions impacts across all bioenergy project typologies is essential for policy makers requiring a contemporaneous view of California’s biofuel market potential. Supply chain analysis is similarly of importance to understand potential. For example, transportation and processing emissions associated with the sourcing of biomass feedstocks from areas where sustainable forest management practices are being conducted may, in concept, negatively impact any net GHG emission benefits derived from the downstream conversion of that feedstock into biofuel. A fuller

¹¹¹ See <https://www.energy.ca.gov/sb100>.

systems-based understanding of emissions throughout various biofuel supply chains in California is required.

RECOMMENDATION

The CPUC is facilitating a technical working group to develop a set of public life cycle analysis (LCA) modeling tools to measure net GHG emissions from BioMAT program projects. The working group, which includes bioenergy, life-cycle, and emissions experts from academia and U.S. Department of Energy national labs, is currently evaluating existing public LCA models developed by other state agencies, such as CARB and CEC-funded Electric Program Investment Charge (EPIC) projects, in order to apply them to the BioMAT program context. However, modifications to the existing modeling tools are required to enable them to more accurately model net GHG emissions from the various BioMAT technologies.

Once accurate BioMAT LCA tools are developed, follow-on LCA tools could also be developed to quantify the net GHG emissions from the BioRAM program (as well as other energy programs) in order to better analyze overall environmental performance. The CPUC could then consider whether bioenergy projects procured through its bioenergy procurement programs should require LCA evaluations to ensure net carbon neutrality (or negativity) to ensure that the state's electricity sector is not replacing fossil-fuel carbon emissions with biomass-related emissions that have not yet been fully characterized.

Statewide Bioenergy markets are characterized by highly opportunistic but disruptive new trends

Emerging renewable energy market segments in the renewable natural gas (RNG) and hydrogen production space will increasingly impact each of the several biofuel feedstock supply chains across California. The secondary result of this increased potential competition for biomass feedstocks could be further constraints on full-scale uptake of the CPUC's existing RPS bioenergy electricity generation programs. The Inflation Reduction Act (IRA) and recent state RNG mandates (SB 1440, Hueso, 2018) will continue to drive demand for new methods of biogas production at price points that are subsidized on both federal and state levels. Biogenic sources of feedstock for biohydrogen production (SB 1075, Skinner, 2022) have been targeted as a key strategic cornerstone of the state's Hydrogen Hub scoping plan. CARB's Low Carbon Fuel Standard (LCFS) market continues to absorb supply from new biogas production facilities utilizing common biomass feedstocks.

The United States Environmental Protection Agency's Renewable Fuel Standard (RFS) program is also being revised to enhance the market value of RNG for transportation fuel. The CPUC has been monitoring stakeholder interest in potential BioMAT electricity generation facilities conversions to stand-alone LCFS and RFS biogas production facilities. Project developers with a secure long-term feedstock supply arrangement – whether that be from forest residuals, organic waste diversion, or agricultural derived material - have a widening array of potentially attractive market segments into which they may consider supplying a biofuel energy product.

The trend currently appears to be a subtle but demonstrable shift from electricity production towards renewable natural gas production. The existing RPS bioenergy programs will likely continue to see implementation challenges as the competitive landscape shifts incrementally towards newly subsidized market segments in these emerging RNG biogas production chains.

RECOMMENDATIONS

The CPUC will continue to monitor biofuel market developments common across both RPS and RNG programs. Continued commitment to interagency coordination with counterparties at CEC, CALFIRE, CARB, Governor's Office of Business and Economic Development (GO-Biz) and other key agencies and jurisdictions working on biofuel market growth in California will be essential in maintaining insight into new market realities representing prospective RPS program implementation challenges. More robust engagement on the ground with biofuel market participants as greater competition for and more innovative utilization of California's biomass feedstocks will help the CPUC more readily understand potential program and regulatory issues in real-time. The critical issue of long-term feedstock contracting which characterizes most successful biofuel projects – whether the project is an RPS or RNG facility - will need to be more thoroughly understood at a policy level should the numerous emerging opportunities for biofuels be fully realized. Furthermore, building a better understanding of biofuel feedstock economics for each renewable energy production outcome could help guide policymakers as they seek policy changes or direct any changes to multiple but competing energy decarbonization programs.

Challenge 2: Project Development Delays

ISSUE

Renewable energy project development is a long and complicated process with numerous interdependent milestones, such that one setback can cascade into a larger delay or even project failure. Projects over the last several years have been challenged by an unparalleled combination of development and interconnection delays, supply chain challenges, and high market prices.

While cost has been and continues to be the preeminent factor in project viability, the confluence of events in recent years, i.e., the COVID-19 pandemic, inflation, and others discussed below, have underscored the importance of risk management strategies to project success, so that retail sellers can meet their RPS requirements.

Market Conditions

Slow recovery from production and shipping bottlenecks have caused significant project development delays, price fluctuations for both raw materials and major components of RPS projects, and inflation. As with many other industries, California's clean energy sector relies heavily on other countries for technology and production capacity. Additionally, at the present global geopolitical environment has become such that the U.S. government is limiting sourcing of products and services from specific countries such as China. For the renewable energy sector, the components and materials essential for solar, wind, and batteries have materially been sourced from China and have contributed to declining costs. The issues of power shortages and other worldwide effects of COVID-19 production shutdowns are beginning to be resolved but now these more recent geopolitical issues stand in the way of return to growth.

One major step in addressing market issues is the recent Inflation Reduction Act of 2022, H.R. 5376 (IRA) which contains provisions to promote renewable project development, including stipulations that can reduce risk. The IRA was signed into law by President Biden on August 16, 2022. It is designed to reduce the federal deficit, lower inflation while investing in domestic energy production and promoting clean

energy. The largest investment made by the IRA is \$369 billion for energy security and climate change. Some of the key components within this investment include the following¹¹²:

Business Incentives and Tax Credits

1. Incentives to businesses to deploy lower-carbon and carbon-free energy sources
2. Tax credits for energy production and investments in wind, solar, and geothermal energies
3. Tax credits for investment in battery storage and biogas
4. Tax credits for investments in nuclear energy, hydrogen energy coming from clean sources, biofuels, and technology that captures carbon from fossil fuel power plants
5. Bonuses for companies based on worker pay and the manufacture of steel, iron, and other components in the U.S.

Industry analysts have estimated that the IRA could lead to the generation of tax credits worth \$576 billion by 2031. The Treasury Department and the Internal Revenue Service published rules on how to regulate tax credits transfers in June this past year and are expected to launch an online registry by the end of 2023.¹¹³

While it may take decades to see the full effects of the IRA on the economy and the climate, one year after the law was enacted, two key trends have emerged:

1. American business investment has been especially strong in research and development (R&D) spending. The IRA, along with the Bipartisan Infrastructure Law (BIL) and the CHIPS and Science Act, likely explains some of that strength.
2. Investments that have been recently announced in the IRA-related sectors of clean energy, electric vehicles, and batteries are concentrated in relatively disadvantaged communities with lower wages, lower college graduation rates, and lower employment rates. Investing in such communities helps provide opportunity to those who live there but also helps boost national productivity growth.¹¹⁴

More specifically, in the IRA's first year:

- Companies have announced 96 gigawatts of new clean power over the previous eight months.¹¹⁵
- The IRA's expected impact on private investment has increased between 50% and 200% from initial estimates, based on research from the Brookings Institution and Rhodium Group.¹¹⁶

The private sector has announced more than \$110 billion in new clean energy manufacturing investments, including more than \$10 billion in solar manufacturing. The Biden-Harris Administration's Invest.Gov site identifies over 250 projects reflecting \$500 billion in announced investments, notably that almost 150 of

¹¹² Fact Sheet: One Year In, President Biden's Inflation Reduction Act is Driving... August 16, 2023, www.whitehouse.gov/briefing-room.

¹¹³ Reuters – "U.S. investor group clinches tax credit deal for \$1.5 billion renewable power acquisition", by Isla Binnie, August 2023.

¹¹⁴ "Building A Clean Energy Economy: A Guidebook to the Inflation Reduction Act's Investments in Clean Energy and Climate Action", January 2023, Version 2. The White House..

¹¹⁵ "Summary of Inflation Reduction Provisions related to Renewable Energy", United States Environmental Protection Agency, June 1, 2023.

¹¹⁶ "Economic implications of the climate provisions of the Inflation Reduction Act" Brookings and "Relay Race, not Arms Race: Clean Energy Manufacturing Implications of the IRA for the US and EU" Rhodium Group (rhg.com)

those projects, reflecting around \$200 billion, are in IRA-related sectors of clean energy, EVs, and batteries.¹¹⁷

RECOMMENDATION

While the IRA benefits will likely address some of the project delay issues it will not address all and it will take time to see the effects. As such it is prudent to take multiple actions and approaches to resolve the myriad of challenges impacting RPS project development to reduce project and portfolio risk. Retail sellers should consider:

- Prioritizing project and resource diversity in meeting their RPS requirements;
- Building new sources of U.S.-based manufactured products which would benefit from IRA incentives;
- Maintaining vigilance on potential changes to the IRA program in 2024; and
- Incorporating reasonable procurement margins to account for delays and potential project failures

Additionally, the CPUC should continue participation in the Tracking Energy Development (TED) Strike Force¹¹⁸ to assist in identifying barriers and coordinating action to address barriers that may impact energy development throughout the State. Also, as investments and funding opportunities arise as the result of the IRA, the CPUC should work to maximize benefits to California ratepayers and workforce.

Challenge 3: Interconnection Demand

ISSUE

Interconnection can be a long process with multiple risk factors that could delay planned commercial operation dates. Developers have experienced growing interconnection queues as CAISO and state authorities deal with processing a surging number of requests and permitting applications. For instance, over 350 GW entered CAISO's interconnection queue this year which is greater than any of CAISO's previous request periods and adding to the already hundreds of projects in the CAISO queue. These requests and projects already in the CAISO queue are predominately solar and storage projects which are needed to meet California's RPS requirements and greenhouse gas reduction goals.

Once interconnection studies are complete, there will need to be interconnection agreements, construction of the interconnections, and potentially grid upgrades for the RPS projects. While the robust interest and development potential is positive in terms of a robust market and supply, to complete all the studies and interconnections within the next few years poses a significant challenge, which persists in both the near- and mid-term time horizons, to meeting California's RPS requirements and clean energy goals.

¹¹⁷ "The Inflation Reduction Act and U.S. Business Investment" – U.S. Department of the Treasury, August 16, 2023, - Eric Van Nostrand, Laura Feiveson.

¹¹⁸ The Tracking Energy Development (TED) Task Force is a joint staff effort at the CPUC, CEC, California Independent System Operator (CAISO) and Governor's Office of Business and Economic Development (GO-Biz) to track new energy projects under development. The TED Task Force can potentially provide project development support, as appropriate, in particular with issues related to government involvement in energy development. For more info, see <https://www.cpuc.ca.gov/news-and-updates/newsroom/summer-2021-reliability/tracking-energy-development>

RECOMMENDATION

CPUC should continue to work with CAISO and its transmission planning process (TPP) and participate in /support CAISO's Interconnection Process Enhancements (IPE) initiative¹¹⁹ which is considering changes to the Generator Interconnection and Deliverability Allocation Procedures. This includes better integrating the interconnection process with IRP and providing feedback on recent proposals by CAISO to improve interconnection request intake and limit projects from lingering in the interconnection queue for too long such as, improved data accessibility, and greater interconnection request requirements through higher fees and deposits and stronger eligibility terms. The CPUC will also work with retail sellers and developers to continue to monitor project development and delays. The Tracking Energy Development Task Force¹²⁰ has been effective at identifying barriers and coordinating action to address barriers that may be impacting energy development and interconnections throughout the state and the CPUC should continue with the effort.

Non-IOUs should consider incorporating stricter interconnection status requirements into their RPS procurement processes as eligibility for solicitations or contract executions, such as requiring projects to complete CAISO's Phase II study process, similar to IOUs, to reduce risk of not meeting RPS requirements. Additionally, retail sellers should consider prioritization of executing contracts with projects at advanced interconnection stages.

¹¹⁹ The Interconnection Process Enhancements initiative is focused on enhancing coordination of resource procurement and interconnection, resource planning and transmission planning to achieve state reliability and policy needs. <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Interconnection-process-enhancements-2023>

¹²⁰ The Tracking Energy Development (TED) Task Force is a joint effort of staff at the CPUC, CEC, California Independent System Operator (CAISO) and Governor's Office of Business and Economic Development (GO-Biz) to track new energy project development and interconnections. <https://www.cpuc.ca.gov/news-and-updates/newsroom/summer-2021-reliability/tracking-energy-development>

Appendices

Appendix A – About the RPS Program

How the RPS Program Works

The RPS program encourages investment in the development of new utility-scale renewable energy facilities to meet the electrical demands of the State of California. RPS is a market-based program where compliance is determined by the quantity of Renewable Energy Credits (REC) procured (1 REC = 1 megawatt hour (MWh)). Eligible renewable generation facilities may be located anywhere within the Western Electricity Coordinating Council (WECC) region.¹²¹ These facilities are permitted to sell RECs to California retail sellers¹²² of electricity to meet their RPS obligations, provided the facility meets all RPS eligibility criteria established by the California Energy Commission (CEC).

The CPUC's implementation of the RPS program complements the RPS program administered by the CEC, as well as supports California's climate change policies. The CPUC's compliance process is completed after the CEC verifies RPS-eligible procurement from renewable energy facilities. The CPUC establishes program policy within its RPS rulemaking proceeding and implements legislation through its CPUC decisions to ensure that electricity retailers comply with CPUC rules and State law.¹²³

The CPUC's responsibilities in the implementation of the RPS program include:

- Setting policy through a public stakeholder process;
- Reviewing and approving each retail seller's RPS procurement plan;
- Reviewing and approving IOU contracts for RPS-eligible energy; and
- Determining and enforcing compliance with procurement requirements.

RPS Procurement Plans

Each year, the CPUC evaluates retail sellers' RPS Procurement Plans to review their near and long-term RPS forecasts and planning mechanisms. The RPS Procurement Plans provide information regarding current generation under contract, projects under development, and forecasted need for additional RPS procurement.

RPS Compliance Requirements

Progress towards the RPS mandate is measured in several ways, including through the analysis of detailed RPS Procurement Plans and RPS Compliance Reports. These documents forecast the compliance status of each retail seller in achieving the statewide mandate.

Retail sellers are required to submit annual preliminary RPS Compliance Reports to the CPUC that contain historical and forecasted data about their renewable procurement. The CPUC evaluates these reports to ensure progress is being made towards the interim targets.

¹²¹ The WECC region extends from the Canadian provinces of Alberta and British Columbia to the northern part of Baja California, Mexico, and encompasses the 14 western U.S. states in between.

¹²² Retail seller is defined as any entity engaged in the retail sale of electricity to end-use customers located within the State, including electrical corporations (as defined in Public Utilities Code § 218), community choice aggregators, and electric service providers.

¹²³ The CPUC Rulemaking for the RPS program is currently R.18-07-003.

The CPUC works closely with the CEC to manage the RPS program, including compliance determinations. Compliance evaluations and official determinations by the CPUC can only take place after the CEC verifies a retail seller's annual REC claims.

The CEC receives reports from energy retail sellers generated by the Western Renewable Energy Generation Information System (WREGIS)¹²⁴ which describes the amount of renewable electricity generated by every eligible facility. The CEC analyzes the WREGIS reports to determine eligibility of the facility, the quantity of RECs created from each RPS-eligible facility, and retail sellers' RPS procurement claim to ensure each REC claimed is eligible for compliance with the RPS and is only counted once.

Once the CEC has verified the number of RPS eligible RECs, a retail seller can use those RECs to meet its RPS compliance obligations, and those RECs are considered retired. The CPUC is then responsible for reviewing how a retail seller's RPS procurement is classified into portfolio content categories (PCCs) and whether it is consistent with the portfolio balance requirement (PBR), the long-term contracting requirement, and the procurement quantity requirement (PQR). These three compliance requirements are explained in further detail in Appendix B below.

RPS Excess Procurement Rules

RECs that are in excess of what is needed to fulfill RPS obligations in one compliance period may be "banked" and used in subsequent compliance periods. SB 2 (1X) (Simitian, 2011) established the ability for a retail seller to carry over procurement from one compliance period to another. The calculations for excess procurement rely on a combination of the PCC classification of the RECs and whether the RECs are associated with short-term or long-term contracts.

Beginning in 2021–2024 compliance period, all excess PCC 1 RECs can be banked, regardless of whether they are associated with short- or long-term contracts; however, no PCC 2 or PCC 3 RECs can be banked.

¹²⁴ The Western Renewable Energy Generation Information System (WREGIS) is an independent renewable energy tracking system for the region covered by the Western Electricity Coordinating Council (WECC).

Appendix B – How RPS Compliance Works

To achieve RPS compliance, retail sellers must meet three requirements:

- Procurement Quantity Requirement (PQR);
- Portfolio Balance Requirement (PBR); and
- Long-Term Contracting Requirement.

As applicable, a retail seller's RPS procurement can contribute to meeting more than one requirement (e.g., all of a retail seller's long-term RPS contracting will eventually contribute to meeting its PQR), but the criteria of all three requirements must be met for a retail seller to be considered compliant with the RPS program, with the exception of small and multi-jurisdictional utilities (SMJUs), which are exempt from the PBR.¹²⁵

Procurement Quantity Requirement (PQR)

The PQR is the statutorily¹²⁶ set percentage of RPS-eligible procurement required in a compliance period. The CPUC implemented annual percentage targets in D.19-06-023, pursuant to SB 100.¹²⁷ The annual percentage target is multiplied by a retail seller's total retail sales in each year for a given compliance period. Retail sellers must meet the PQR established for each compliance period or they are considered non-compliant with the RPS program and assessed a penalty of \$50/REC.

Portfolio Balance Requirement (PBR)

California's RPS program defines all renewable procurement acquired from contracts executed after June 1, 2010, into one of three portfolio content categories (PCCs). The PCC classifications are also instrumental in determining a retail seller's compliance with the RPS program.

- **Category 1:** Renewable energy credits (RECs) with associated energy from facilities with a first point of interconnection within a California Balancing Authority (CBA), or facilities that schedule electricity into a CBA on an hourly or sub-hourly basis.
- **Category 2:** RECs with incremental electricity, and/or substitute energy, from outside a CBA. Generally, Category 2 RECs are generated from out-of-state renewable facilities and require a Substitute Energy Agreement that details the simultaneous purchase of energy and RECs from an RPS-eligible facility.
- **Category 3:** Unbundled RECs that do not include the physical delivery of the energy attached to the REC. Generally, Category 3 RECs are associated with the sale and purchase of the RECs themselves, not the energy.

The PBR is defined by the minimum and maximum of the three PCCs, which are delineated by type of renewable procurement. Most retail sellers have specified requirements for the balance or mix of procurement from contracts that are executed after June 1, 2010. Specifically, these retail sellers must procure a minimum level of Category 1 RECs, which increases over the initial three multi-year compliance

¹²⁵ See Appendix A: About the RPS Program for more detail.

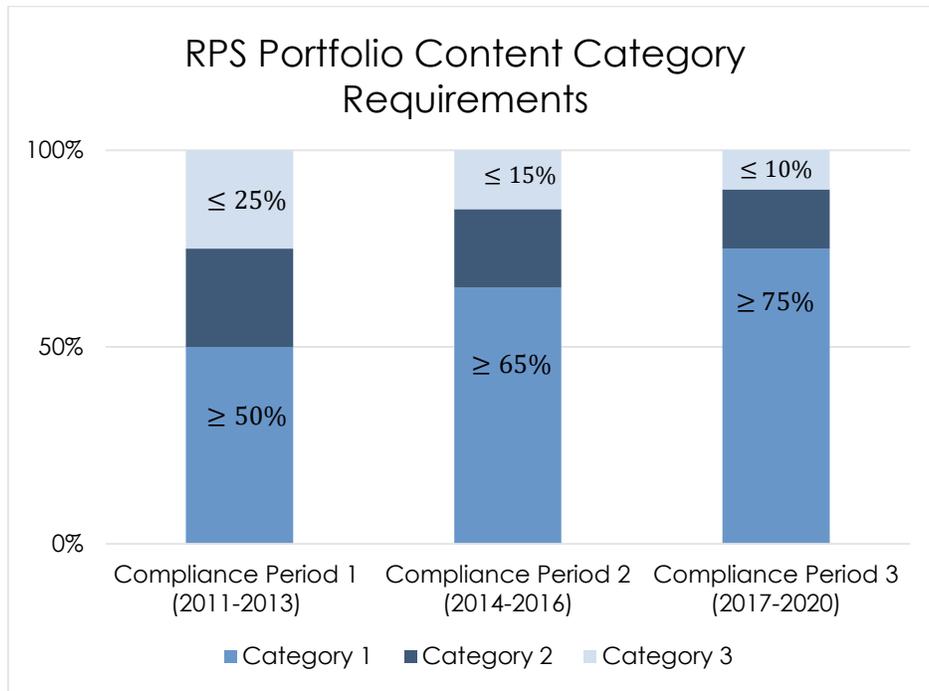
¹²⁶ Defined by Public Utilities Code § 399.15(b)(2)(B) and were first implemented by the CPUC in 2011. The code has been amended to increase the PQR multiple times, with the most recent amendment being from Senate Bill (SB) 100 in 2018, increasing to 60 percent for all subsequent three-year compliance periods.

¹²⁷ See D.19-06-023 for more information:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M307/K595/307595168.PDF>

periods.¹²⁸ There is also a maximum limit on the amount of Category 3 procurement that may be used in each compliance period, which decreases over the same timeframe.

The figure below depicts the PBR limits and how they adjusted across compliance periods until 2020, at which point they remain at those limits for each successive compliance period.



All retail sellers except for SMJUs must follow the above specified requirements for the balance or mix of procurement from contracts that are executed after June 1, 2010. The SMJUs are exempt from the portfolio balance requirements and may procure any amount of RPS-eligible energy from any of the categories.¹²⁹

Long-Term Contracting Requirement

All electric retail sellers must procure a specified percentage of their RPS portfolio from long-term contracts, defined as 10 or more years.¹³⁰ For the first three compliance periods through 2020, 0.25 percent of a retail seller’s total electricity portfolio must come from long-term contracts. SB 350 increased this requirement, implemented in D.17-06-026, to 65 percent of all RPS procurement must come from long-term contracts beginning in the 2021–2024 Compliance Period, or in the 2017–2020 Compliance Period if an electric retail seller elects for early compliance with this requirement.

¹²⁸ See Public Utilities Code § 399.16(c) for additional information. Also, for more details on the RPS Compliance rules, visit <https://www.cpuc.ca.gov/General.aspx?id=3856>.

¹²⁹ Pursuant to Public Utilities Code § 399.17 and 399.18.

¹³⁰ See Public Utilities Code § 399.13(b) for additional information.

Appendix C – Summary of Accomplishments from Jan. 2022 – Oct. 2023

January 2022	<ul style="list-style-type: none"> ▪ CPUC adopted D.22-01-004 approving the 2021 RPS Procurement Plans¹³¹ ▪ CPUC adopted D.22-01-025 enforcing Gexa’s penalty for RPS non-compliance.¹³² ▪ CPUC staff held a BioMAT Technical Working Group meeting to review CPUC staff’s progress in the evaluation of existing greenhouse gas life cycle analysis tools
February 2022	<ul style="list-style-type: none"> ▪ CPUC staff held three BioMAT Technical Working Group meetings to seek feedback from working group members on CPUC staff’s ongoing evaluations of existing greenhouse gas life cycle analysis tools
March 2022	<ul style="list-style-type: none"> ▪ CPUC staff conducted a follow-up BioMAT Technical Working Group meeting to seek additional feedback from working group members on CPUC staff’s ongoing evaluations of existing greenhouse gas life cycle analysis tools
April 2022	<ul style="list-style-type: none"> ▪ CPUC issued the Assigned Commissioner and Assigned Administrative Law Judge’s Ruling issued identifying issues and schedule of review for 2022 RPS Procurement Plans¹³³ ▪ CPUC issued the Assigned Commissioner and Assigned Administrative Law Judge’s Ruling Amending the Scope of R.18-07-003 to implement VAMO as adopted in D.21-05-030¹³⁴ ▪ CPUC staff held three BioMAT Technical Working Group meetings to seek feedback from working group members on CPUC staff’s initial evaluation results of existing greenhouse gas life cycle analysis tools
May 2022	<ul style="list-style-type: none"> ▪ CPUC issued the 2022 Padilla Report on Costs and Cost Savings for the RPS Program to the Legislature, pursuant to Public Utilities Code § 913.3: https://www.cpuc.ca.gov/RPS_Reports_Data/ ▪ CPUC staff held a BioMAT Technical Working Group meeting to present preliminary recommendations for the adoption of several greenhouse gas life cycle analysis tools that could potentially be used to model BioMAT project emissions
June 2022	<ul style="list-style-type: none"> ▪ CPUC adopted D. 22-06-034 establishing rules for portfolio content category classification for voluntary allocations of RPS resources.¹³⁵

¹³¹ <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M441/K459/441459991.PDF>

¹³² <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M446/K941/446941917.PDF>

¹³³ <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M467/K556/467556099.PDF>

¹³⁴ <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M465/K562/465562463.PDF>

¹³⁵ <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M488/K540/488540704.PDF>

	<ul style="list-style-type: none"> CPUC approved Resolution E-5209 adopting 2022 updated administratively set fixed avoided-cost rates for the ReMAT program. CPUC approved Resolution E-5216 approving Voluntary Allocation standard contracts for the allocation of RPS resources subject to the PCIA as part of the VAMO process.
July 2022	<ul style="list-style-type: none"> CPUC adopted D.22-07-003 denying two Petitions For Modification concerning the public disclosure of transmission and distribution safety information.¹³⁶
August 2022	<ul style="list-style-type: none"> IOUs, CCAs, and ESPs submitted annual RPS Compliance Reports CPUC issued Resolution E-5220 approving with modification PG&E Advice Letters 6528-E/E-A, and SDG&E Advice Letters 3968-E/E-A and approving SCE Advice Letters 4745-E/E-A as they include the required modifications to their ReMAT tariffs and PPAs to accommodate the eligibility of facilities enhanced with storage consistent with D.21-12-032
September 2022	<ul style="list-style-type: none"> CPUC staff held a workshop on Reliable and Clean Power Procurement Program Staff Options Paper
October 2022	<ul style="list-style-type: none"> CPUC approved IOUs’ proposed pro-forma Market Offer contracts
November 2022	<ul style="list-style-type: none"> CPUC adopted D.22-11-021 approving Voluntary Allocations and modifying Market Offer Process for the sale of excess renewable resources pursuant to Decision 21-05-030.
December 2022	<ul style="list-style-type: none"> CPUC adopted D.22-12-030 approving the 2022 RPS Procurement Plans
January 2023	<ul style="list-style-type: none"> IOUs, CCAs, and ESPs filed Final 2022 RPS Procurement Plans CEC adopted Verification Report for Compliance Period 2017-2020
February 2023	<ul style="list-style-type: none"> CPUC staff approved the IOUs’ proposed long-term pro-forma Market Offer contracts and solicitation protocols
March 2023	<ul style="list-style-type: none"> IOUs, CCAs, and ESPs submitted Final 2017-2020 RPS Compliance Reports CPUC adopted D.23-03-009 closing Rulemaking 15-02-020 CPUC held a prehearing conference for R.22-10-010 implementing AB 843
April 2023	<ul style="list-style-type: none"> CPUC approved the IOUs’ proposed short-term Market Offer contracts CPUC issued assigned Commissioner Scoping Memo and Ruling for R.22-10-010 CPUC staff held a workshop on AB 843 implementation
May 2023	<ul style="list-style-type: none"> CPUC issued the 2023 Padilla Report on Costs and Cost Savings for the RPS Program to the Legislature, pursuant to Public Utilities Code § 913.3: https://www.cpuc.ca.gov/RPS_Reports_Data/

¹³⁶ <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M494/K572/494572241.PDF>

	<ul style="list-style-type: none"> ▪ CPUC issued the Assigned Commissioner and Assigned Administrative Law Judge’s Ruling issued identifying issues and schedule of review for 2023 RPS Procurement Plans ▪ CPUC adopted Resolution E-5264 approving PG&E rider and amendment to BioMAT PPA with Scotts Valley Energy Corporation ▪ CPUC issued Administrative Law Judge’s Ruling requesting party comments on AB 843 workshop questions
June 2023	<ul style="list-style-type: none"> ▪ CPUC adopted Resolution E-5270 adopting 2023 updated administratively set fixed avoided-cost rates for the ReMAT program. ▪ RPS Procurement Plan Webinar ▪ CPUC adopted Resolution E-5275 approving Bear Valley Electric Service, Inc. long-term power purchase agreement with Shell Energy North America.
July 2023	<ul style="list-style-type: none"> ▪ IOUs, CCAs, and ESPs submitted Draft 2023 RPS Procurement Plans ▪ RPS Compliance Report Webinar
August 2023	<ul style="list-style-type: none"> ▪ IOUs, CCAs, and ESPs submitted annual RPS Compliance Reports ▪ CPUC adopted D.23-08-003 granting Petition for Modification of D.19-09-043 regarding Effective Load Carrying Capability ▪ CPUC adopted D.23-08-032 approving Liberty Utilities Application 21-04-006
September 2023	<ul style="list-style-type: none"> ▪ CPUC approved Order Extending Statutory Deadline of R.18-07-003 to July 31, 2024
October 2023	<ul style="list-style-type: none"> • CPUC issued proposed Decision implementing AB 843 • CPUC adopted D.23-10-006 denying ReMAT PFM • CPUC adopted Resolution E-5288 implementing SB 1109 (Caballero, 2022) extending BioRAM program

Appendix D – Glossary of Acronyms and Terms

(BioMAT) Bioenergy Market Adjusting Tariff: A feed-in tariff program for bioenergy renewable generators less than 3 MW in size.

(BioRAM) Bioenergy Renewable Auction Mechanism: An RPS program that implements the Governor’s October 2015 Emergency Order on Tree Mortality, as well as SB 859 (2016), and mandates utilities to procure bioenergy from forest fuel from High Hazard Zones (HHZ) to mitigate the threat of wildfires.

(CBA) California Balancing Authority: A balancing authority is charged with maintaining the safe and reliable transportation of electricity on the power grid and ensures transparent access to the transmission network and market transactions.

(CCA) Community Choice Aggregator: Local government agencies that purchase and may develop power on behalf of residents, businesses, and municipal facilities within a local or sub-regional area. As of November 1, 2020, there are 29 registered CCAs in California with 23 active CCAs and 6 CCAs set to serve customers in 2021 and 2022.

(ESP) Electric Service Provider: An entity that offers electrical service to commercial and industrial customers within the service territory of an electrical corporation and includes the unregulated affiliates and subsidiaries of an electrical corporation.

(GHG) Greenhouse Gas: a gas that contributes to the greenhouse effect by absorbing infrared radiation, e.g., carbon dioxide, methane, nitrous oxide and fluorinated gases.

(IRP) Integrated Resource Plan: A planning mechanism to consider all the CPUC’s electric procurement policies and programs to ensure California has a safe, reliable, and cost-effective electricity supply. The CPUC implements an integrated resource planning process that will ensure that retail sellers meet targets that allow the electricity sector to contribute to California’s economy-wide greenhouse gas emissions reductions goals.

(IOU) Investor-Owned Utility: IOUs are privately owned electricity and natural gas providers and are regulated by the California Public Utilities Commission (CPUC). Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric comprise approximately three quarters of the retail electricity supply in California.¹³⁷

(LSE) Load Serving Entity: All entities that serve electricity to customers including IOUs, SMJUs, CCAs, and ESPs.¹³⁸

(PCIA) Power Charge Indifference Adjustment: charge to customers that departed a utility for costs that utility incurred in anticipation of serving the customers to ensure remaining customers are not burdened by the departure of those customers.

(PPA) Power Purchase Agreement: The contractual agreement under which the financial and technical aspects of renewable energy generation projects are agreed upon between power sellers and retail sellers.

(PBR) Portfolio Balance Requirement: The PBR is one of the requirements that LSEs must meet to achieve RPS Compliance. California’s RPS program defines all renewable procurement acquired from contracts executed after June 1, 2010, into one of three portfolio content categories (PCCs): Category 1,

¹³⁷ For information on the differences between Publicly-Owned Utilities and Investor-Owned Utilities, please visit the California Energy Commission’s website: https://www.energy.ca.gov/pou_reporting/background/difference_pou_iou.html.

¹³⁸ The CPUC is responsible for compliance and enforcement activities for retail sellers, which excludes Publicly Owned Utilities.

Category 2, and **Category 3**. The PBR establishes minimum and maximum amounts of the three PCCs that must be used for RPS compliance. More detailed explanation of the PBR, PCCs, and RPS compliance is provided in Appendix B.

(PQR) Procurement Quantity Requirement: The PQR is one of the requirements that LSEs must meet to achieve RPS Compliance. The PQR is the statutorily set percentage of RPS-eligible procurement required in a compliance period. It is calculated by multiplying the annual percentage target by a retail sellers' total retail sales in each year for a given compliance period. More detailed explanation of the PQR and RPS compliance is provided in Appendix B.

(RA) Resource Adequacy: The ability of a utilities' reliable capacity resources (supply) to meet customers' energy or system loads (demands) at all hours.

(RAM) Renewable Auction Mechanism: An RPS procurement process the IOUs may use to procure RPS generation and to satisfy authorized procurement needs or legislative mandates. RAM streamlines the procurement process for developers, utilities, and regulators by 1) allowing project bidders to set their own price, 2) providing a simple standard contract for each utility, and 3) allowing all contracts to be submitted to the CPUC through an expedited regulatory review process.

(REC) Renewable Energy Credit: A market-based instrument that represents the property rights to the environmental, social and other non-power attributes associated with the production of electricity from a renewable source. RECs play an important role in driving the deployment of renewable energy in California and achieving the goals of Renewables Portfolio Standard (RPS). A REC confers to its holder a claim on the renewable attributes of one unit of energy (MWh) generated from a renewable resource. RECs are "created" by a renewable generator simultaneous to the production of electricity and can subsequently be sold separately from the underlying energy.

(ReMAT) Renewable Market Adjusting Tariff: A feed-in tariff program for small renewable generators up to 3 MW in size.

Retail Sellers: All entities that sell electricity to customers, including IOUs, CCAs and ESPs. A Publicly Owned Utility does not meet the definition of a retail seller and POU compliance with the RPS program is overseen by the CEC.

(SMJU) Small and Multi-Jurisdictional Utilities: Investor-owned utilities that are considered small and multi-jurisdictional subject to different rules per PUC § 399.17 and § 399.18.

(VAMO) Voluntary Allocation and Market Offer: authorized process for PG&E, SCE, and SDG&E to once per RPS Compliance Period allocate a "slice" of their entire PCIA-eligible RPS portfolios to eligible retail sellers and offer to the market any remaining PCIA-eligible RPS portfolio.

Appendix E – California's Active Electricity Retail Sellers

Investor-Owned Utilities (IOUs)	Small and Multi-Jurisdictional Utilities (SMJUs)	Community Choice Aggregators (CCAs)	Electric Service Providers
Pacific Gas and Electric Company (PG&E)	Bear Valley Electric Service (BVES)	Apple Valley Choice Energy (AVCE)	3 Phases Renewables
Southern California Edison Company (SCE)	Liberty Utilities (formerly CalPeco)	Central Coast Community Energy (CCCE)	BP Energy Retail Company (formerly EDF)
San Diego Gas & Electric Company	PacifiCorp	Clean Energy Alliance (CEA)	Brookfield Renewable Energy Marketing U.S., LLC
		Clean Power Alliance (CPA)	Calpine Energy Solutions
		CleanPowerSF (CPSF)	Calpine Power America
		Desert Community Energy (DCE)	Commercial Energy of CA
		East Bay Community Energy (EBCE) / Ava Community Energy	Constellation NewEnergy
		Energy for Palmdale's Independent Choice (EPIC)	Direct Energy
		King City Community Power (KCCP)	Gexa Energy California, LLC
		Lancaster Choice Energy (LCE)	Just Energy Solutions, Inc.
		Marin Clean Energy (MCE)	Palmco Power CA
		Orange County Power Authority (OCPA)	Pilot Power Group
		Peninsula Clean Energy (PCE)	Praxair Plainfield, Inc.
		Pico Rivera Innovative Municipal Energy (PRIME)	Shell Energy North America
		Pioneer Community Energy (Pioneer)	Tenaska Power Services Co.
		Pomona Choice Energy	UC Regents
		Rancho Mirage Energy Authority (RMEA)	
		Redwood Coast Energy Authority (RCEA)	
		San Diego Community Power (SDCP)	
		San Jacinto Power (SJP)	
		San Jose Clean Energy (SJCE)	
		Santa Barbara Clean Energy (SBCE)	
		Silicon Valley Clean Energy (SVCE)	
		Sonoma Clean Power (SCP)	
		Valley Clean Energy Alliance (VCEA)	

Appendix F – Public Utilities Code Section 913.4

In order to evaluate the progress of the State's electrical corporations in complying with the California Renewables Portfolio Standard Program (Article 16—commencing with § 399.11—of Chapter 2.3), the commission shall report to the Legislature no later than November 1 of each year on all of the following:

- (a) The progress and status of procurement activities by each retail seller pursuant to the California Renewables Portfolio Standard Program.
- (b) For each electrical corporation, an implementation schedule to achieve the renewables portfolio standard procurement requirements, including all substantive actions that have been taken or will be taken to achieve the program procurement requirements.
- (c) The projected ability of each electrical corporation to meet the renewables portfolio standard procurement requirements under the cost limitations in subdivisions (c) and (d) of § 399.15 and any recommendations for revisions of those cost limitations.
- (d) Any renewable energy procurement plan approved by the commission pursuant to § 399.13, schedule, and status report for all substantive procurement, transmission development, and other activities that the commission has approved to be undertaken by an electrical corporation to achieve the procurement requirements of the renewables portfolio standard.
- (e) Any barriers to, and policy recommendations for, achieving the renewables portfolio standard pursuant to the California Renewables Portfolio Standard Program.
- (f) The efforts each electrical corporation is taking to recruit and train employees to ensure an adequately trained and available workforce, including the number of new employees hired by the electrical corporation for purposes of implementing the requirements of Article 16 (commencing with § 399.11) of Chapter 2.3, the goals adopted by the electrical corporation for increasing women, minority, and disabled veterans trained or hired for purposes of implementing the requirements of Article 16 (commencing with § 399.11) of Chapter 2.3, and, to the extent information is available, the number of new employees hired and the number of women, minority, and disabled veterans trained or hired by persons or corporations owning or operating eligible renewable energy resources under contract with an electrical corporation. This subdivision does not provide the commission with authority to engage in, regulate, or expand its authority to include, workforce recruitment or training.