2019

California Renewables Portfolio Standard Annual Report

November 2019

RENEWABLES PORTFOLIO STANDARD ANNUAL REPORT

November 2019

ABOUT THIS REPORT

Each November, the California Public Utilities Commission is required to report to the Legislature on the progress of the State's electricity retail sellers in complying with the Renewables Portfolio Standard (RPS) program. This Annual Report complies with Public Utilities Code § 913.4.

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EXECUTIVE SUMMARY

In compliance with Senate Bill (SB) 1222[1] (Hertzberg, 2016), the California Public Utilities Commission (CPUC) reports to the Legislature each year on the progress of the Renewables Portfolio Standard (RPS) program. This report describes the progress of the State's electricity retail sellers[2] in complying with the RPS program and shows that:

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

- Most of the retail sellers procured at or above the 29 percent RPS annual target for 2018.[3]
- The large Investor-Owned Utilities (IOUs) have executed renewable electricity contracts necessary to meet the 2020 RPS requirement of 33 percent.
- All but three retail electricity sellers were found in compliance for Compliance Period 2 (2014-2016).[4]

2. Increased Renewable Procurement by Community Choice Aggregators (CCAs) and Electric Service Providers (ESPs) Must Occur in the Near Term to Meet RPS Requirements

- Current load forecasts indicate the CCAs' 33 percent RPS requirement in 2020 is approximately 24,329 GWh. Based on the Renewable Net Short[5] calculations, the aggregate CCAs forecast that their executed contracts would result in a procurement shortfall of approximately 10,518 GWh.
- Current load forecasts indicate the ESPs' 33 percent RPS requirement in 2020 is approximately 6,685 GWh and the aggregate ESPs forecast a procurement shortfall based on their executed contracts of 2,483 GWh to meet the 33 percent RPS requirement in 2020.
- The IOUs and Small and Multi-Jurisdictional Utilities (SMJUs) are well-positioned to meet the 65 percent long-term contracting requirement while 11 of the 27 CCAs that plan to serve load in 2021[6] have procured long-term contracts at or above the 65 percent requirement.

3. RPS Portfolio Characteristics Show Falling Contract Pricing and Increasing In-State Procurement

- RPS prices reached a historic low of $38/MWh in 2018 for average annual RPS eligible energy contracts across all technology types and have dropped an average of 11.5 percent per year between 2007 and 2018.
- By Compliance Period 4 (2021-2024), IOUs are forecasted to procure most of their RPS resources from in-state resources; CCAs are forecasted to significantly decrease their out-of-state procurement; and ESPs are forecasted to continue to procure a significant portion of their RPS resources from out-of-state.
- An average of 80 percent of the IOU, SMJU, and CCA renewable portfolios were solar and wind resources in 2018.

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[1] As codified in Public Utilities Code § 913.4. See Appendix C for full text of § 913.4.
[2] *See* Appendix C for full list of active load serving entities.
[3] Based on preliminary 2019 Annual Compliance Report filings submitted to the CPUC.
[4] *See* Chapter III for more on compliance determinations.
[5] Renewable Net Short (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 Load Serving Entities' Annual RPS Procurement Plans.
[6] SB 350 established the long-term contracting requirements for the RPS program and applies to all retail sellers beginning Compliance Period 4 (2021-2024). For more information, see Chapter III.

I. BACKGROUND

Each November, the California Public Utilities Commission (CPUC) reports to the Legislature 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:

(a) Progress on RPS procurement activities;
(b) Details on RPS activities and implementation;
(c) Projected ability to meet RPS under cost limitations;
(d) Status of RPS plans, activities, procurement, and transmission;
(e) Barriers and policy recommendations to achieving the RPS; and
(f) 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) increased the RPS to 60 percent by 2030 and established a goal for 100 percent of the State's electricity to come from renewable and carbon-free 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 load serving entities (LSEs)[7] to procure 60 percent of their total electricity retail sales from renewable energy resources by 2030. Increasing the level 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.[8] Entities under the CPUC's jurisdiction serve approximately 75 percent of the total electricity demand in California. The Publicly Owned Utilities (POUs) serve the remaining 25 percent.[9] Of these retail sellers within the CPUC's jurisdiction, the large IOUs served approximately 73 percent of the total electricity load in 2018, while the SMJUs served 1 percent, CCAs served 13 percent, and ESPs served the remaining 13 percent in 2018.[10]

[7] Also referred to as retail electricity 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 LSEs that the CPUC regulates.
[8] *See* Chapter IV: Compliance & Enforcement for more details on RPS program requirements.
[9] POUs report their RPS compliance to the CEC and their information is not included in this report.
[10] LSEs' Annual RPS Compliance Reports, August 2019.

II. RPS PROGRESS AND STATUS

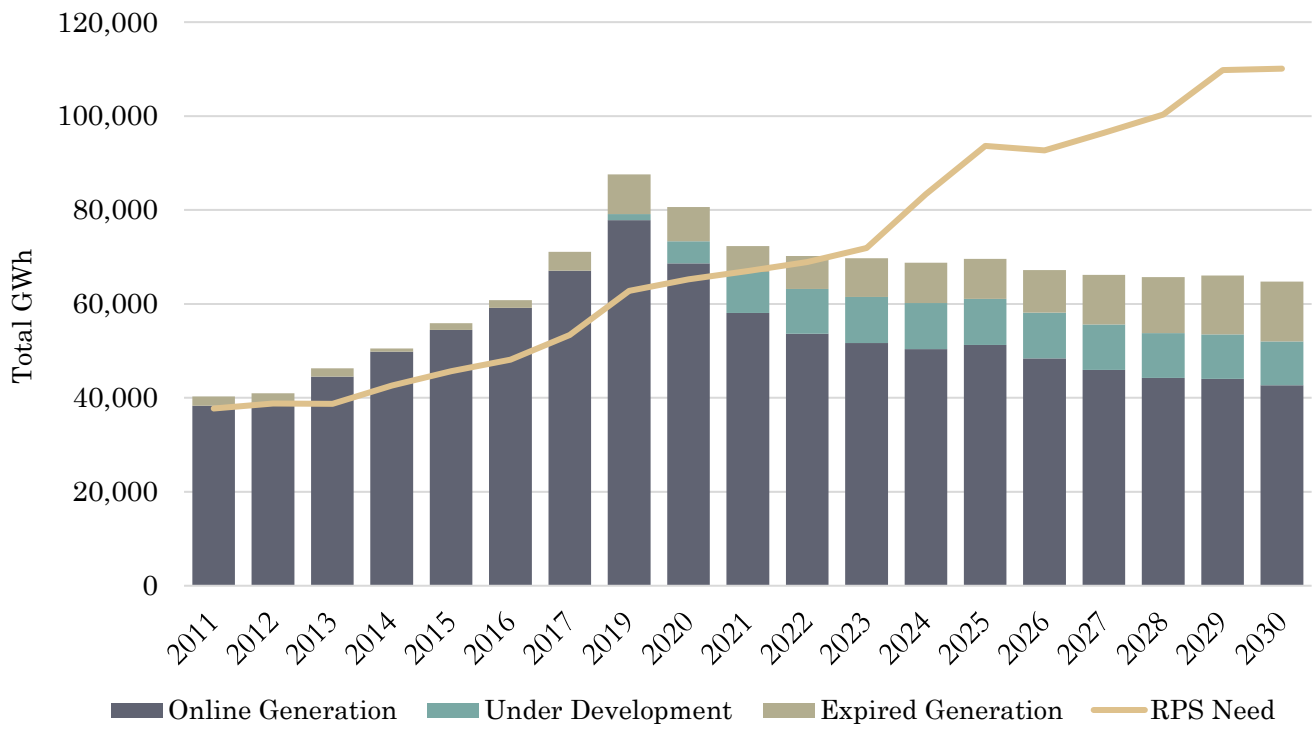
This chapter uses historical annual data to illustrate the state of the RPS program using data up to December 31, 2018. The data was obtained from the 2019 Draft RPS Procurement Plans[11] and the 2019 RPS Compliance Reports[12] of all retail sellers, including the large investor-owned utilities (IOUs), small and multi-jurisdictional utilities (SMJUs), community choice aggregators (CCAs), and electric service providers (ESPs).

Current Renewable Portfolios

All electricity retail sellers had an annual target to serve at least 29 percent of their electric load with RPS-eligible resources by December 31, 2018. In general, retail sellers either met or exceeded the 29 percent interim RPS target[13] and many are on track to achieve their 2017-2020 compliance period requirements.

Figure 1 below shows statewide progress in meeting the 60 percent RPS requirements and includes renewable procurement data from all load-serving entities.

Figure 1: Aggregated Retail Seller Progress Towards 60% RPS (2011-2030)



Data Source: IOUs' Draft 2019 RPS Procurement Plans (June 2019)
CPUC 2019 RPS Annual Report (November 2019)

[11] Each year, LSEs are required to submit their RPS Procurement Plans to the CPUC for approval. Draft RPS Procurement Plans were submitted in June 2019.
[12] LSEs are required to submit Compliance Reports each year on August 1 to demonstrate progress towards meeting their RPS requirements.
[13] Compliance with California's RPS program are determined by multi-year compliance periods.

Large Investor-Owned Utilities (IOUs)

The large IOUs serving electric load in California include 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 County, SCE's territory spans from Riverside to Mono County, and SDG&E serves San Diego County and southern Orange County.[14] The three large IOUs are on track to meet their 60 percent 2030 RPS procurement mandate.

The IOUs have already surpassed the 2018 annual RPS percentage target of 29 percent, as illustrated in Table 1.[15]

Table 1: Actual 2018 Large Investor-Owned Utilities' RPS Procurement Percentages

Pacific Gas and Electric	39%
Southern California Edison	36%
San Diego Gas & Electric	44%

Data Source: IOUs' Annual RPS Compliance Reports, August 2019

The three large IOUs are currently forecasted to continue to surpass RPS requirements and have excess procurement for the next six years. The IOUs may choose to apply excess renewable electricity procured in prior years to meet their RPS requirements in future compliance periods. Alternatively, they may sell renewable energy credits (RECs)[16] associated with the excess procurement to other LSEs, such as CCAs or ESPs, or provide higher than required amounts of renewable energy to their customers.

A variety of market conditions have caused the IOUs to be procured beyond their minimum RPS requirements. These market conditions include the initial need to hedge against early program experience with project failure, the current paradigm of increasing departing load to CCAs, and the increase in behind-the-meter solar generation.[17]

[14] For more information on California electric utility service areas, see the CEC's California Energy Maps website: https://www.energy.ca.gov/maps/serviceareas/electric_service_areas.html

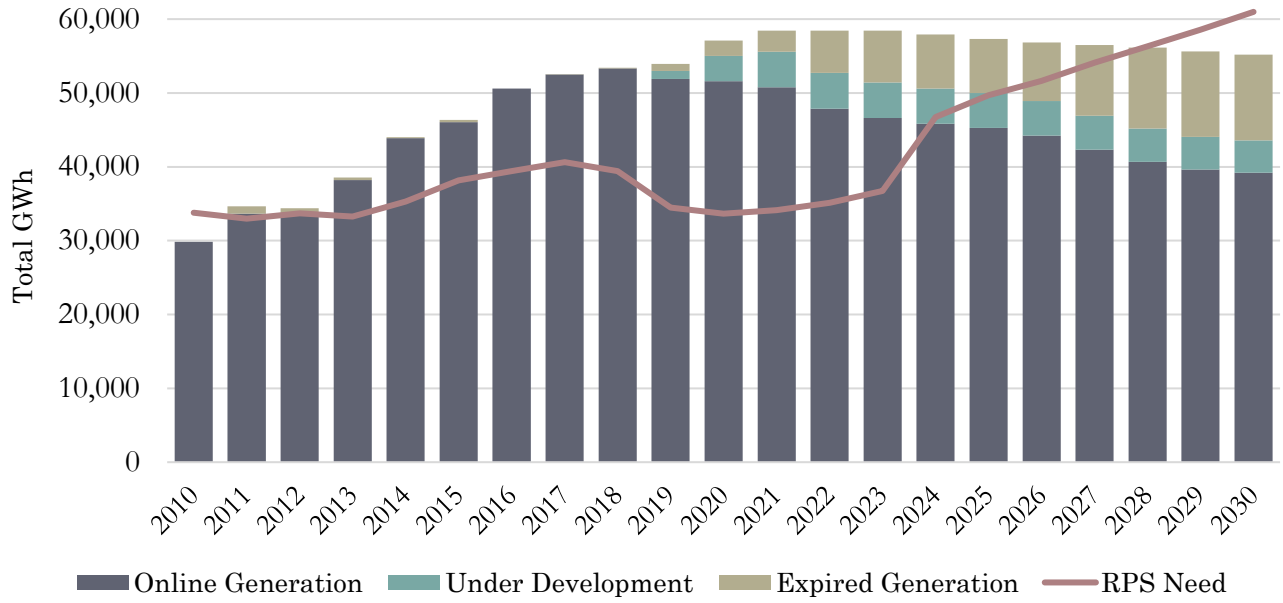
[15] Based on their annual Draft 2019 RPS Procurement Plans, as well as Compliance Reports filed with the CPUC in 2019.

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

[17] The IOUs' excess procurement is based on the current forecast of bundled electricity load and the amount of RPS resources already under contract.

Figure 2 uses the most current annual data to illustrate the actual and forecasted progress the IOUs have made toward meeting the 2030 60 percent RPS mandate. Generation forecasts from projects "Under Development" are risk-adjusted to account for a certain degree of project failure.[18] The "Expired Generation" data represent the amount of generation associated with facilities that no longer have a Power Purchase Agreement (PPA) with one of the IOUs. Although this generation is not under contract, there is a possibility that one of the IOUs will re-contract with these facilities in the future or be contracted by another LSE.

Figure 2: Aggregated Large Investor-Owned Utilities' Progress Towards 60% RPS (2010-2030)



Data Source: IOUs' 2019 Draft RPS Procurement (June 2019)
CPUC 2019 RPS Annual Report (November 2019)

The graph shows a forecasted surplus of renewable generation through 2024 and physical deficit beginning in 2026.

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

The IOUs forecast that they can meet their RPS requirements by using a combination of online generation and excess procurement to exceed the 33 percent RPS requirement by 2020. Excess procurement includes RECs that are not used to fulfill RPS obligations in one compliance period but used in subsequent compliance periods.[19] Given that the IOUs have significant excess eligible RPS procurement to apply in later years, they did not conduct annual RPS solicitations in 2016, 2017, 2018, or 2019, nor do they plan to undertake solicitations for additional renewables in 2020.[20]

Table 2 uses a simple average[21] to demonstrate the IOUs' actual procurement and forecasted procurement. The data show that the IOUs expect to exceed their 2020 RPS compliance period requirements and to have procured 40 percent RPS by 2020.

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

Compliance Period 2			Compliance Period 3				Compliance Period 4			
25% Requirement			*33% Requirement*				*44% Requirement*			
2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
28%	30%	35%	36%	40%	37%	44%	51%	51%	52%	52%

Data Source: IOU RPS Compliance Reports, August 2019 [22]

Small and Multi-Jurisdictional Utilities (SMJUs)

The SMJUs[23] serving electric load in California are Bear Valley Electric Service (BVES), Liberty Utilities[24] (Liberty), and PacifiCorp. BVES provides electricity service to the Big Bear Valley in the San Bernardino Mountains and Liberty serves the counties located in 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.

[19] 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.

[20] The CPUC must approve solicitations outlined in an IOU's annual RPS Procurement Plan. In 2020 and beyond, the IOUs have proposed only to procure for mandated programs (e.g., BioMAT).

[21] 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 and individual contracts may be confidential for 3 years from the date that energy deliveries begin. Additionally, retail sellers may redact forecast information three years forward. See the CPUC's Decision on Confidentiality (D.06-06-066) for more information: http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/57772.PDF

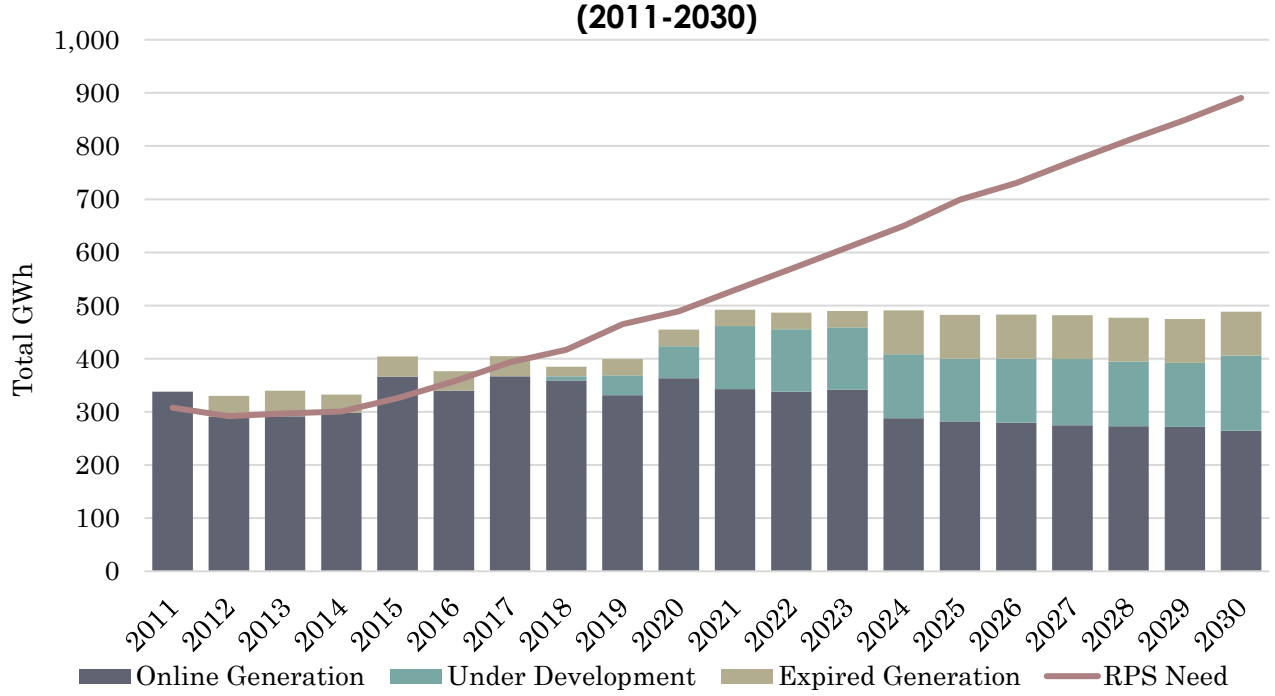
[22] Forecasted data from 2019 through 2022 is aggregated because each IOU's information is treated as confidential per D.06-06-066.

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

[24] Formerly CalPeco Electric.

As illustrated in Figure 3, the aggregate SMJU data indicates that the SMJUs will collectively need to procure additional resources to meet the 2017-2020 Compliance Period requirements.

Figure 3: Aggregated Small and Multi-Jurisdictional Utilities' Progress Towards 60% RPS (2011-2030)



Data Source: SMJUs' 2019 Draft RPS Procurement Plans (June 2019)
CPUC 2019 RPS Annual Report (November 2019)

The three SMJUs forecasted their RPS procurement percentages as shown in Table 3 below using a simple average of the three SMJUs' RPS percentages.[25]

Table 3: Average Actual and Forecasted Small and Multi-Jurisdictional Utilities RPS Percentages for Bear Valley Electric Service, Liberty Utilities, and PacifiCorp

Compliance Period 2			Compliance Period 3				Compliance Period 4			
25% Requirement			*33% Requirement*				*44% Requirement*			
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
29%	25%	27%	27%	26%	25%	28%	28%	28%	28%	16%

Data Source: SMJU RPS Compliance Reports, August 2019

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

Community Choice Aggregators (CCAs)

CCAs are local government agencies that are certified by the CPUC to procure electricity on behalf their communities formerly served by the IOUs.[26] In 2018, 19 CCAs[27] operated in California and collectively served 13 percent of electric load.[28] About half of those CCAs[29] indicate that they have procured at or above the 2018 annual RPS targets.

Table 4 provides a statewide average of reported procurement percentages by those CCAs operating in 2018.[30]

Table 4: Average Actual and Forecasted Community Choice Aggregators' RPS Percentages

Compliance Period 2			Compliance Period 3				Compliance Period 4			
25% Requirement			*33% Requirement*				*44% Requirement*			
2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
48%	39%	47%	50%	46%	41%	29%	17%	16%	17%	15%

Data Source: CCAs' RPS Compliance Reports (August 2019)

Annual compliance reports indicate most CCAs will need to procure additional renewable resources to meet the 60 percent RPS target by 2030.[31] Figure 4 uses the most current compliance data to illustrate the actual and forecasted progress the 2018 operational CCAs have made toward meeting the RPS requirements.

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

[27] 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, Monterey Bay Community Power, Pioneer Community Energy, Rancho Mirage, San Jacinto, San José, Solana Energy Alliance and Valley Clean Energy Alliance.

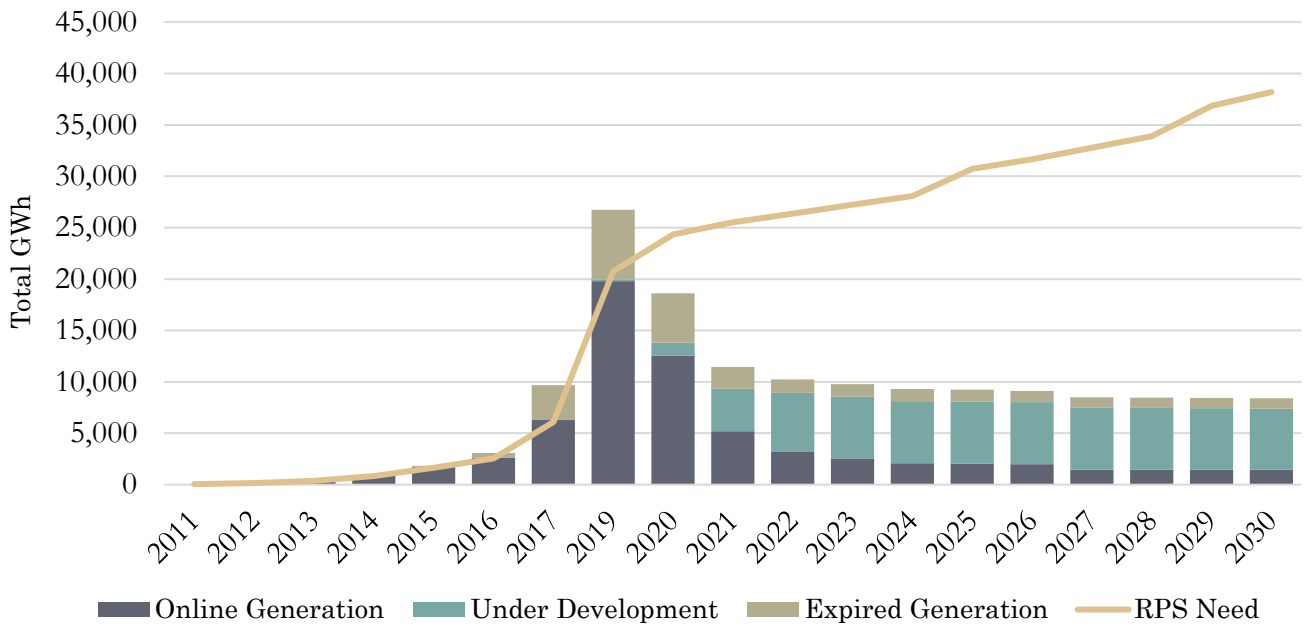
[28] Since December 2018, the CPUC certified the implementation plans of eight new CCAs. These CCAs are not expected to begin serving load until late 2020 and early 2021. For more information on new CCA implementation, visit https://www.cpuc.ca.gov/general.aspx?id=2567.

[29] The CCAs include Marin Clean Energy (MCE), Sonoma Clean Power (SCP), Lancaster Choice Energy (LCE), Peninsula Clean Energy (PCE), CleanPowerSF, Apple Valley Choice Energy (AVCE), Pico Rivera Innovative Municipal Energy (PRIME), Redwood Coast Energy Authority (RCEA), and Silicon Valley Clean Energy (SVCE).

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

[31] *See* Table 5 for a breakdown of RPS position by each individual operating CCA.

Figure 4: Aggregated Community Choice Aggregators' Progress Towards 60% RPS (2011-2030)



Data Source: CCAs' 2019 RPS Draft Procurement Plans (June 2019)
CPUC 2019 RPS Annual Report (November 2019)

Of the 27 certified CCAs, the 19 CCAs that operated in 2018 have executed renewable energy contracts to serve their forecasted load. The short-term contracts for the CCAs are generally RPS energy from the IOUs' portfolios, which is sold through RPS sales solicitations. Beginning in 2020 and 2021, eight new certified CCAs are projected to begin serving load that have not procured any RPS-eligible energy. The overall CCA RPS requirements will increase commensurately with the CCAs' load and near-term renewable procurement need.

In 2018, the 19 operational CCAs served a total of 23,800 GWh of load[32] and had an average RPS position of 46 percent. Table 5 below shows the actual and forecasted positions by individual CCAs that were operational in 2018.

Table 5: Annual RPS Position of Community Choice Aggregators (%)[33]

First Year Serving Load	CCA	Actuals	Forecasted	
		2018	2019	2020
2010	Marin Clean Energy	62%	61%	61%
2014	Sonoma Clean Power	49%	49%	49%
2015	Lancaster Choice	37%	35%	35%
2016	Peninsula Clean Energy	54%	54%	54%
2016	CleanPowerSF	51%	-	-
2017	Apple Valley Choice	37%	35%	36%
2017	Pico Rivera	59%	50%	50%
2017	Redwood Coast Energy Authority	44%	46%	20%
2017	Silicon Valley Clean Energy	56%	53%	52%
2018	Valley Clean Energy Alliance	48%	42%	29%
2018	Monterey Bay Community Power	34%	32%	30%
2018	San Jacinto Power	41%	35%	35%
2018	Rancho Mirage Energy Authority	36%	35%	35%
2018	Clean Power Alliance	60%	-	-
2018	East Bay Community Energy	42%	40%	-
2018	Pioneer Community Energy	33%	33%	35%
2018	Solana Energy Alliance	48%	-	-
2018	San José Community Energy	47%	38%	11%
2018	King City Community Power	29%	31%	33%

Data Source: CCA Draft RPS Procurement Plans (June 2019)

The CPUC anticipates that the year-to-year fluctuations in RPS positions will decrease substantially by 2021 in response to SB 350, which requires that 65 percent of RPS resources must be contracted for ten or more years.[34]

[32] Total number of retail sales reported in the 2018 RPS Compliance Reports, submitted August 1, 2019.
[33] CleanPowerSF, Clean Power Alliance, East Bay Community Energy and Solana Energy Alliance have claimed confidentiality of their forecasted RPS position per CPUC D.06-06-066.
[34] Senate Bill (SB) 350 (de León, 2015) requires that 65 percent of total RPS procurement comes from long term contracts (≥ 10 years) beginning in 2021.

Electric Service Providers (ESPs)

ESPs serve commercial and industrial customers in the Direct Access (DA) program.[35] ESPs currently serve approximately 13 percent of electricity load within the CPUC's jurisdiction.[36] Senate Bill (SB) 237 (Hertzberg, 2018) authorizes an increase in the maximum allowable electric load cap of 4,000 GWh for Direct Access. The current load cap for ESPs in California is about 25,000 GWh which has been reached by existing ESPs.[37] Table 6 provides an average of ESP RPS progress reported in procurement percentages. Most ESPs will need to procure to meet the 2020 RPS requirements.

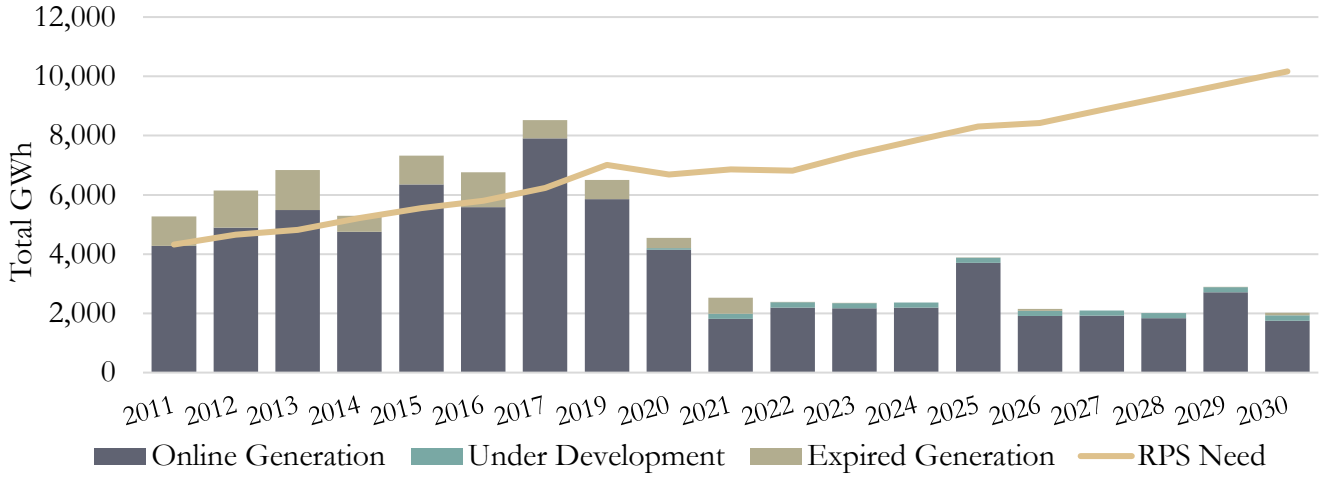
Table 6: Average Actual and Forecasted Electric Service Providers' RPS Percentages

Compliance Period 2			Compliance Period 3				Compliance Period 4			
25% Requirement			*33% Requirement*				*44% Requirement*			
2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**
18%	21%	35%	26%	29%	27%	18%	7%	10%	10%	10%

Data Source: ESPs' RPS Compliance Reports (August 2018)

Though ESPs are required to file both RPS Compliance Reports and Procurement Plans, they do not provide detailed long-term forecasts on their renewable procurement. The ESPs' forecasted percentages are lower into the future because most of the ESPs' RPS procurement has been undertaken with short-term contracts, despite the 65 percent long-term requirement commencing in 2021. As illustrated in Figure 5, the aggregated ESP data indicates that ESPs will collectively need to procure additional resources to meet the RPS requirements in the 2017 – 2020 Compliance Period and beyond.

Figure 5: Aggregated Electric Service Providers' Progress Towards 60% RPS (2011-2030)



Data Source: ESPs' 2019 Draft RPS Procurement Plans (June 2019)
CPUC 2019 RPS Annual Report (November 2019)

[35] Direct Access (DA) service is retail electric service where industrial and commercial 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/General.aspx?id=7881.
[36] *See* Appendix C for a list of active ESPs.
[37] *See* D.10-03-022, "*Decision Regarding Increased Limits for Direct Access Transactions,"* for more information.

Renewable Technology Mix

Resource diversity is essential for achieving a balanced and reliable energy generation portfolio to support increasing the amount of renewables used in California.[38] 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 carbon-free electricity by 2045 and is crucial for meeting the State's climate change and emissions reduction goals.

Large Investor-Owned Utilities

As shown below in Figure 6, the IOUs have procured a mix of renewable energy resources including wind, solar thermal, solar photovoltaic (PV), geothermal, biopower, and small hydroelectric facilities to meet the requirements of the RPS program.[39]

In 2018, the majority of the IOUs' portfolios were comprised of solar and wind technologies as shown in Table 7 below.

Table 7: Portfolio Percentages for Large Investor-Owned Utilities' 2018 RPS Mix

	Biopower	Geothermal	Small Hydro[40]	Conduit Hydro[41]	Solar PV	Solar Thermal	Wind
Pacific Gas and Electric	11%	10%	7%	0%	38%	8%	26%
Southern California Edison	2%	23%	2%	0.1%	33%	3%	37%
San Diego Gas & Electric	5%	0%	0%	0%	48%	0%	49%

Small and Multi-Jurisdictional Utilities

Apart from PacifiCorp, the renewable portfolio mixes of California's SMJUs are not as diverse as those of the large IOUs. As Figure 7 shows, BVES only procured RECs from wind resources in 2018.[42] Liberty procured primarily from solar PV and geothermal facilities. In 2018, PacifiCorp had the most diverse mix with six different technologies[43] in its California renewable energy portfolio,[44] with the majority comprised of wind and small hydroelectric facilities.

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[38] *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.
[39] Approximately 0.1 percent of SCE's renewable portfolio is comprised of Conduit Hydroelectric technology. The technology category of "Biopower" consists of biomass, biogas, biodiesel, landfill gas, and municipal solid waste.
[40] Small Hydro projects are defined as hydroelectric facilities that are under 30 MW in capacity by the CEC's RPS Eligibility Guidebook.
[41] Conduit Hydro facilities use the hydroelectric potential of an existing man-made conduit that is operated to distribute water and should have a facility capacity of 30 MW or less to be considered RPS-eligible.
[42] Per Public Utilities Code 399.17 and CPUC Decisions (D.)11-12-052 and (D).12-06-038, SMJUs can use RPS-eligible procurement for RPS compliance without regard to the portfolio balance requirements.
[43] Approximately 0.3 percent of PacifiCorp's renewable portfolio is comprised of Conduit Hydroelectric technology.
[44] 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.

In 2018, the majority of the SMJUs' portfolios were comprised of solar and wind technologies as shown in Table 8 below.

Table 8: Portfolio Percentages for Small and Multi-Jurisdictional Utilities' 2018 RPS Mix

	Biopower	Geothermal	Small Hydro	Conduit Hydro	Solar PV	Wind
Bear Valley Electric Service	-	-	-	-	-	100%
Liberty Utilities	13%	-	-	-	85%	2%
PacifiCorp	21%	2%	16%	0.2%	12%	50%

Community Choice Aggregators

In 2018, the majority of the CCAs' portfolios were comprised of wind resources. Certain CCAs, such as MCE, PCE, Pioneer, and RCEA, have a diverse portfolio with a variety of renewable technologies including bioenergy, geothermal, hydroelectric, solar and wind.

Table 9 illustrates the renewable energy portfolio mixes of the 19 CCAs that operated in California in 2018.[45]

Table 9: Portfolio Percentages for Community Choice Aggregators' 2018 RPS Mix

	Biopower	Geothermal	Small Hydro	Solar PV	Wind
Apple Valley Choice Energy	16%	-	7%	52%	25%
Clean Power Alliance	-	-	-	60%	40%
CleanPowerSF	-	4%	-	-	96%
East Bay Community Energy	-	3%	-	36%	61%
King City Community Energy	-	-	-	10%	90%
Lancaster Choice Energy	28%	-	25%	13%	33%
Monterey Bay Community Power	-	-	-	80%	20%
Marin Clean Energy	1%	7%	4%	18%	67%
Peninsula Clean Energy	1%	3%	2%	15%	79%
Pioneer Community Energy	10%	6%	20%	49%	15%
Pico Rivera Innovative Municipal Energy	-	33%	36%	-	31%
Redwood Coast Energy Authority	48%	16%	-	8%	27%
Rancho Mirage Energy Authority	-	-	-	-	100%
Sonoma Clean Power	-	37%	-	16%	47%
Solana Energy Alliance	-	43%	-	-	57%
San Jose Clean Energy	-	-	-	-	100%
San Jacinto Power	-	-	-	-	100%
Silicon Valley Clean Energy	-	-	7%	33%	60%
Valley Clean Energy Alliance	-	-	0.5%	-	99.5%

Data Source: CCAs' Annual RPS Compliance Reports (August 2019)

[45] A list of CCAs' acronyms can be found in Appendix C: California's Active Load Serving Entities.

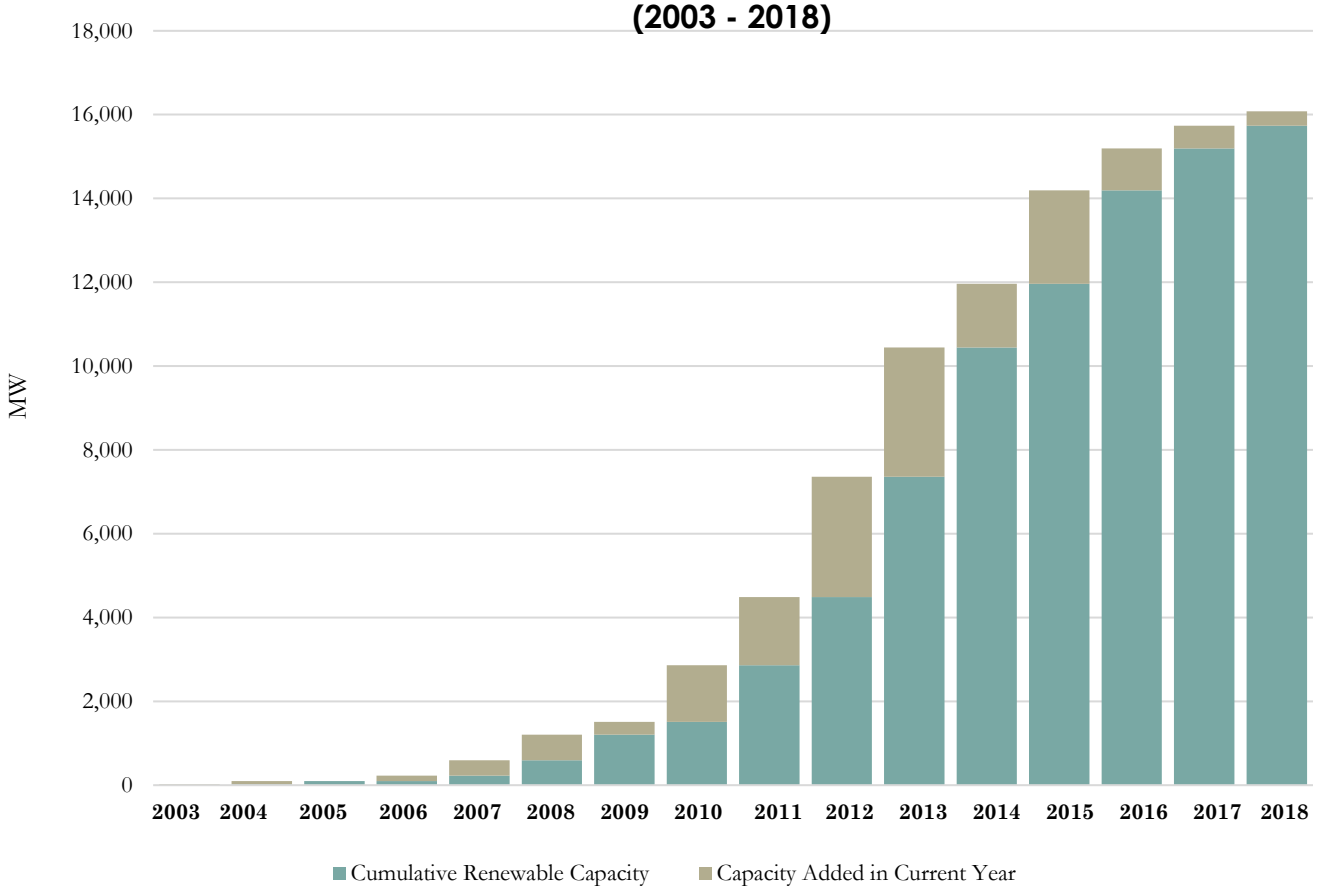
Contracted Renewable Capacity

The RPS program aids in developing the State's transmission and land use planning activities related to the development of renewable energy resources. Increasing renewable capacity on the electric system plays an important role in meeting the State's greenhouse gas reduction goals for the electric sector. Since 2003, the three large IOUs have contracted for over 21,000 MW of renewable capacity[46] 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 CPUC has collected data on how much capacity has been approved for the large IOUs since the start of the RPS program.

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 2018. Most of the new facilities procured for the RPS program are located in-state. Approximately 2,800 additional MW of renewables contracted by the IOUs are scheduled to come online in 2019 and 2020.

Figure 6: CPUC Approved Large Investor-Owned Utilities RPS Capacity Additions (2003 - 2018)



Data Source: CPUC RPS Database, October 2019
CPUC 2019 RPS Annual Report (November 2019)

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

Renewable Procurement and Project Development

Large Investor-Owned Utilities

In 2018, the IOUs collectively executed 14 BioMAT contracts and five power purchase agreements (PPAs) (RFO and Bilateral) for a total of 156 MW of newly contracted RPS capacity.[47] Table 10 below shows the number of IOU RPS contracts approved by the CPUC.

Table 10: Large Investor-Owned Utilities' RPS Contracts Approved by the CPUC in 2018

	PG&E		SCE		SDG&E		Totals	
Procurement Program	Contracts	MW	Contracts	MW	Contracts	MW	**Contracts**	**MW**
BioMAT	11	16	3	5	0	0	**14**	**21**
RFO/Bilateral	0	0	3	113	2[48]	22	**5**	**135**
Totals	11	16	6	118	2	22	**19**	**156**

Data Source: CPUC RPS Database, October 2019

REC Sales

Due to the IOUs' forecasted excess RPS procurement, the CPUC authorized the IOUs to hold REC sales solicitations in 2018 to sell RPS energy from their portfolios.[49] PG&E and SDG&E held REC sales solicitations in the first half of 2018 and SCE launched a REC sales solicitation in the last quarter of 2018. Table 11 below shows REC sales solicitation summaries by IOU.

Table 11: Large Investor-Owned Utilities' REC Sales Contracts Approved by the CPUC in 2018

	PG&E		SCE		SDG&E		Totals	
Procurement Program	Contracts	GWh	Contracts	GWh	Contracts	GWh	**Contracts**	**GWh**
REC Sales Solicitation	22	13,442	1	300	4	874	**27**	**14,616**

Data Source: CPUC RPS Database, October 2019

[47] Per Decision (D.)12-06-038, the CPUC collects monthly data from the large IOUs on RPS projects, including contract details, project development status, technology type, location, capacity, financing status, construction start date, commercial online date, regulatory status, and interconnection details. Table 10 illustrates data from the large IOUs, but there were also other RPS contracts signed by the SMJUs, CCAs, and ESPs.

[48] SDG&E's contracts were a result of a Green Tariff Shared Renewables (GTSR) Program joint RFO seeking contracts with facilities that produce RPS-eligible energy. RECs associated with unsubscribed GTSR energy deliveries may be used for RPS compliance, thus these projects have been entered into the RPS Database. *See* D.15-01-051.

[49] *See* Decision (D).17-12-007.

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 LSEs. IOU REC sales also offer a path for smaller or newer LSEs procure quantities to meeting their RPS compliance needs.

Community Choice Aggregators

As Table 12 shows, 11 CCAs have executed long-term contracts with new utility-scale renewable projects.

Table 12: New Renewables Projects with Community Choice Aggregator Contracts

CCA	Technology	Capacity (MW)	County Location	Contract Term (Years)	COD[50]
Apple Valley Choice Energy	Wind	4[51]	Riverside	10	2021
Clean Power Alliance	Solar PV	40	Kern	15	2021
Clean Power Alliance	Solar PV	233	Riverside	15	2021
Clean Power Alliance	Small Hydro	12	Kern	10	2020
CleanPowerSF	Solar PV	62	Riverside	20	2020
East Bay Community Energy	Solar PV	100	Fresno	20	2021
East Bay Community Energy	Solar PV	56	Tulare	15	2021
East Bay Community Energy	Solar PV	112	Kern	15	2021
East Bay Community Energy	Wind	56	Alameda	20	2020
Lancaster Choice Energy	Wind	11	Riverside	10	2021
Monterey Bay Community Power	Solar PV	88	Kings	15	2021
Monterey Bay Community Power	Solar PV	76	Kern	20	2021
Marin Clean Energy	Solar PV	5	Napa	20	2019
Marin Clean Energy	Solar PV	4	Marin	20	2020
Redwood Coast Energy Authority	Solar PV	2	Humboldt	10	2020
Rancho Mirage Energy Authority	Wind	6	Riverside	10	2021
Sonoma Clean Power	Solar PV	50	Stanislaus	20	2023
San Jose Clean Energy	Solar PV	100	Fresno	20	2022
Silicon Valley Clean Energy	Solar PV	83	Kings	15	2021
Silicon Valley Clean Energy	Solar PV	70	Kern	20	2021
Total		**1,070**			

Data Source: CCAs' RPS Draft Procurement Plans (June 2019), CCAs' Annual RPS Compliance Reports (August 2019), and press releases for contracts executed after Annual RPS Compliance Report submissions.

[50] Commercial operation date (COD) is defined as the date which a project has achieved or is expected to achieve full commercial operation.

[51] AVCE, LCE, and RMEA executed contracts with the same utility-scale wind project in Riverside County, each taking a portion of the facility's total output.

Several operating CCAs have only entered into short-term contracts with RPS facilities that are already in commercial operation, including King City Community Power, Pico Rivera Innovative Municipal Energy, Pioneer Community Energy, San Jacinto Power, Solana Energy Alliance, and Valley Clean Energy. The seven[52] CCAs launching in 2020 have not yet procured any RPS energy.

Small and Multi-Jurisdictional Utilities

BVES did not procure any additional RPS resources in 2018 and Liberty executed three short-term unbundled REC contracts. PacifiCorp executed a contract with an out-of-state wind facility for approximately 200 MW of new renewables set to come online in 2020.

Electric Service Providers

The vast majority of ESPs exclusively contract with existing renewable energy facilities that have achieved commercial operation. As previously explained in this chapter, ESPs generally contract for short-term procurement, ranging from one to three-year terms. However, two ESPs have recently executed long-term contracts with new utility-scale renewable resources.

Table 13 below shows the new long-term contracts executed by Shell Energy North America (SENA) and Calpine Energy Solutions (CES).

Table 13: New Renewables Projects with Electric Service Provider Contracts

ESP	Technology	Capacity (MW)	County Location	Contract Term (Years)	COD
Calpine Energy Solutions	Solar PV	20	Kings	10	2020
Shell Energy North America	Solar PV	100	Riverside	15	2021
Shell Energy North America	Wind	100	Riverside	12	2020
Total		**220**			

Data Source: ESPs' Draft RPS Procurement Plans (June 2019) and ESPs' Annual RPS Compliance Reports (August 2019)

[52] City of Baldwin Park, City of Commerce, City of Pomona, City of Palmdale, City of Hanford, Desert Community Energy, and Western Community Energy of Seven Cities.

Progress in Long-Term Procurement Contracting

SB 350, which established increased long-term contracting requirements for the RPS program, applies to all retail sellers beginning in Compliance Period 4 (2021-2024). Pursuant to SB 350, the CPUC revised its compliance requirements in 2017 to allow retail sellers to elect early compliance with the new long-term contracting requirements.[53] Retail sellers who elect to comply early with long-term contracting for Compliance Period 2021 – 2024 are required to procure 65 percent of their RPS requirements from long-term contracts in Compliance Period 2017-2020. Six LSEs, including all IOUs and certain SMJUs and one ESP, have elected to early-comply with Compliance Period 2021 - 2024 long-term contracting rules.[54]

This section uses RPS compliance data to identify the status and progress of all retail sellers in meeting the 65 percent long-term contracting requirement. Of the procurement contracted to date, Table 14 illustrates how much of that procurement is from long-term contracts.

Table 14: Average Percentage of Long-Term Contracts for Procurement to Date by Load Serving Entity

	Actuals		Forecasted	
LSE Type	**Compliance Period 1**	**Compliance Period 2**	**Compliance Period 3**	**Compliance Period 4**
IOU	87%	99%	99%	99%
SMJU	49%	43%	92%	100%
CCA	8%	11%	17%	40%
ESP	6%	7%	12%	99%

Data Source: LSEs' Annual RPS Compliance Reports (August 2019)

Large Investor-Owned Utilities: The three large IOUs are well-positioned to meet the 65 percent long-term contracting requirement, and each IOU has elected to comply with Compliance Period 2021-2024 in Compliance Period 2017-2020. 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: Similar to the large IOUs, the SMJUs are also well-positioned to meet the 65 percent long-term contracting requirement, and BVES and PacifiCorp have elected to early comply with Compliance Period 2021-2024. BVES procures all of its RPS energy from one long-term contract that ends in 2023. BVES must procure additional RPS energy to meet the procurement requirements for 2024 and beyond.

Liberty executed one long-term contract for unbundled RPS energy and has two utility-owned generating facilities to satisfy its RPS requirements through 2030. Based on its current load forecasts for Compliance Period 2021-2024, Liberty is sufficiently procured to meet its long-term contracting requirement. Finally, nearly all of PacifiCorp's RPS procurement from 2018 through 2030 is derived from long-term contracts.

[53] *See* Decision (D.)17-06-026 "*Decision Revising Compliance Requirements for the California Renewables Portfolio Standard in Accordance with Senate Bill 350,*" for more information.

[54] LSEs with early compliance elections include PG&E, SCE, SDG&E, BVES, PacifiCorp, and The Regents of the University of California.

Community Choice Aggregators: The CCAs collectively need to make more progress in meeting the 65 percent long-term contracting requirement. Only 40 percent of their RPS contracting to date for Compliance Period 4 has met the 65 percent long-term contracting requirement, representing roughly 16 percent of their overall RPS need between 2021 and 2024. Out of the 26 CCAs that plan to serve load in 2020, 11[55] have already procured long-term contracts at or above the 65 percent requirement, one[56] has procured some long-term contracts but needs to procure more to meet the 65 percent requirement, and one recently executed a long-term contract but has not updated its RPS compliance or procurement plan filings with the CPUC. Thirteen CCAs[57] have not procured any long-term RPS contracts. Out of the 13 CCAs that have not procured any long-term contracts, six have procured only short-term contracts and seven have not procured any RPS-energy at all.

Electric Service Providers: Historically, ESPs have procured the minimum 0.25 percent quantity required for long-term contracting. Forecasting their long-term procurement requirement beyond the near term is challenging because ESPs do not provide load forecasts more than a few years out. The ESPs collectively need to make more progress in meeting the 65 percent long-term contracting requirement. Although 99 percent of their RPS contracting to date for Compliance Period 4 has met the 65 percent long-term contracting requirement, this only represent roughly 9 percent of their overall RPS need between 2021 and 2024. However, of the 13 ESPs[58] that will be serving load in the 2021 – 2024 Compliance Period, 10[59] have procured enough long-term energy to meet the 65 percent long-term contracting requirement. One[60] has procured some long-term energy but needs to procure more to meet the requirement, and two have not procured any long-term RPS energy.

The CCAs' and ESPs' forecasted shortfalls in meeting the 65 percent long-term contracting requirement raises concerns for potential failure in meeting overall RPS requirements. Long-term contracts are often associated with new facilities which often take several years to be developed. Also, new renewable project development may be delayed or terminated as a result of unforeseen circumstances such as permitting or transmission delays, project failure, or contract default, underscoring the immediate need for new resource contracting in the near-term. See Chapter VI for further discussion on the progress and recommendations regarding long-term procurement contracting.

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[55] The 11 CCAs include Clean Power Alliance, CleanPowerSF, East Bay Community Energy, Lancaster Choice Energy, Monterey Bay Community Power, Marin Clean Energy, Peninsula Clean Energy, Redwood Coast Energy Authority, Rancho Mirage Energy Authority, Sonoma Clean Power and Silicon Valley Clean Energy.

[56] The CCA is Apple Valley Choice Energy.

[57] The 13 CCAs that have not procured any long-term RPS energy include City of Baldwin Park, City of Commerce, City of Pomona, Desert Community Energy, City of Hanford, King City Community Power, City of Palmdale, Pioneer Community Energy, Pico Rivera Innovative Municipal Energy, Solana Energy Alliance, San Jacinto Power, Valley Clean Energy Alliance, and Western Community Energy of Seven Cities. San Jose Community Energy has recently executed a long-term contract but has not updated their procurement numbers with the CPUC through RPS compliance reports or procurement plans.

[58] The 13 ESPs include: 3 Phases Renewables, American PowerNet, Calpine Power America, Calpine Energy Solutions, Constellation NewEnergy, Commercial Energy of CA, Direct Energy Business, EDF Industrial Power Services, Just Energy Solutions, Pilot Power Group, Shell Energy North America, Tiger Natural Gas and UC Regents.

[59] The 10 include: 3 Phases Renewables, Calpine Power America, Calpine Energy Solutions, Commercial Energy of CA, Direct Energy Business, EDF Industrial Power Services, Pilot Power Group, Shell Energy North America, Tiger Natural Gas and UC Regents.

[60] The ESP is Just Energy Solutions.

Out-of-State Procurement

From its inception, the RPS was conceived to spur new technologies and renewable capacity additions in California and increase renewable energy on the State's grid. While California prioritizes in-state renewable resources, those resources located out-of-state also aid in achieving California's RPS targets. Through the implementation of portfolio balance requirement (PBR),[61] retail sellers procure a mix of in-state and out-of-state renewable resources from facilities within the WECC and count this procurement for compliance with the program. It should be noted that out-of-state procurement does not necessarily represent a particular portfolio content category (PCC).[62] Of the procurement contracted to date , Table 15 shows how retail sellers have procured energy from outside of California to meet their RPS requirements in each Compliance Period.

Table 15: Percentage of Out-of-State RPS Procurement

	Actuals		Forecasted	
LSE Type	**2011-2013**	**2014-2016**	**2017-2020**	**2021-2024**
IOU	17%	18%	24%	25%
SMJU[63]	76%	81%	87%	100%
CCA	82%	44%	51%	13%
ESP	78%	64%	43%	43%

Data source: LSE's 2019 RPS Compliance Reports

By Compliance Period 4 (2021 – 2024), IOUs are forecasted to procure most of their RPS resources from in-state resources and CCAs are forecasted to significantly decrease their out-of-state procurement while ESPs and SMJUs are forecasted to continue to procure a significant portion of their RPS resources from out-of-state.

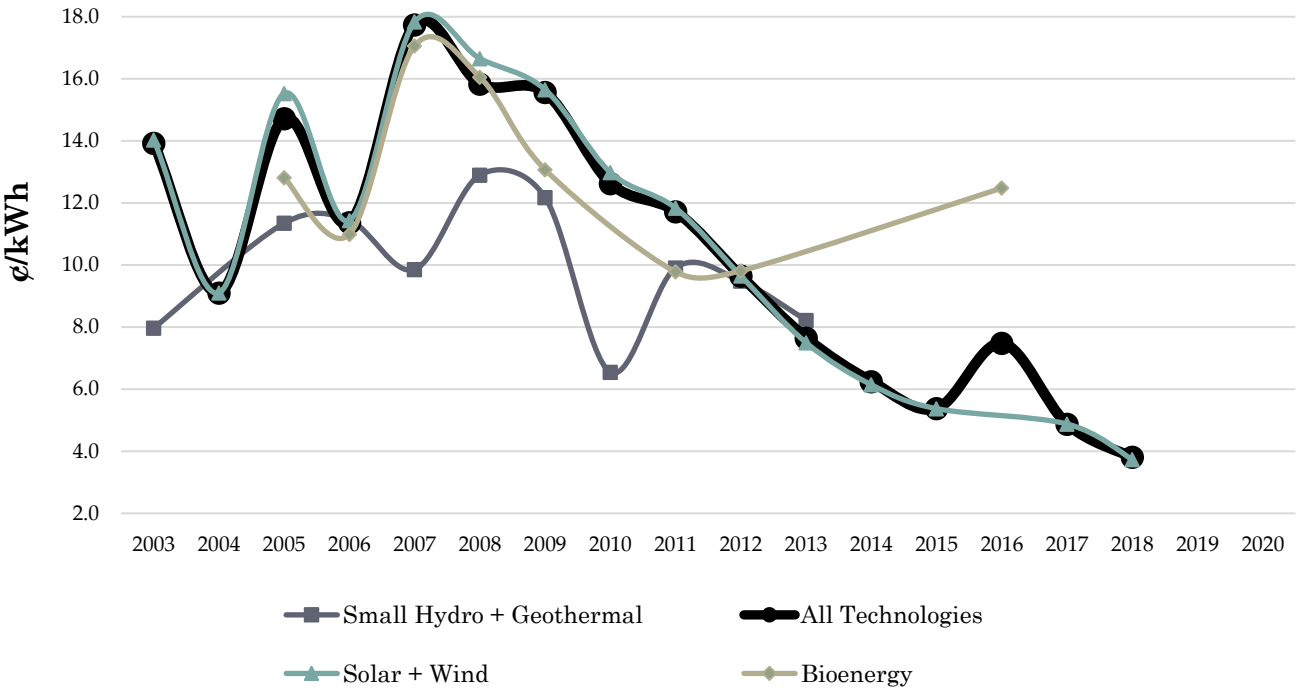
RPS Procurement Costs

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 methodology[64] 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 Planning[65] (IRP) proceeding to identify the most cost-effective portfolio of resources to inform future procurement activities.

[61] *See* Chapter III for an overview of RPS compliance components.
[62] The product and structures of the transaction determine which category the procurement may fall into. For example, out-of-state renewable resources could have a first point of interconection with California and the procured RECs could be classified as PCC 1.
[63] *See* Public Utilities Code § 399.17 for more information on exceptions to the PBR and out-of-state procurement rules for SMJUs.
[64] The Least-Cost/Best-Fit methodology is a valuation framework that the IOUs use to the rank ordering and selection of least-cost and best-fit renewable resources to comply with annual RPS obligations on a total cost basis.
[65] For more information on the IRP proceeding (R. 16-02-007), visit https://www.cpuc.ca.gov/irp/.

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 by technology category for procuring RPS eligible projects with capacities greater than 3 MW in cents per kilowatt-hour (¢/kWh) for the three IOUs.

Figure 7: Historical Trend of Large Investor-Owned Utilities' RPS Contract Costs by Technology (Real Dollars) 2003 - 2020



Data Source: CPUC 2019 Annual Report on Costs and Cost Savings for the RPS Program (Padilla Report)[66]
CPUC 2019 RPS Annual Report (November 2019)

In real dollars, between 2007 and 2018 RPS contract prices have dropped an average of 11.5 percent per year. The downward trend in contract prices can be attributed to falling prices for wind and solar technologies, which together make up 83.2 percent of the total renewable generating capacity in California.[67] In 2016, average annual contract prices spiked due to mandated bioenergy procurement from high hazard zones (HHZs).[68] In 2018, the trend of falling renewables contract costs continued and reached a historic low average price of 3.81 ¢/kWh for RPS-eligible energy contracts.

[66] RPS 2018 Padilla Report to the Legislature on Costs and Savings for the RPS in 2018: https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/About_Us/Organization/Divisions/Office_of_Governmental_Affairs/Legislation/2019/Padilla%20Report%202019%20-%20Final(1).pdf. 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.

[67] For more information on California's statewide renewables breakdown see http://www.caiso.com/informed/Pages/CleanGrid/default.aspx

[68] Implementation of Governor Brown's October 30, 2015, Emergency Proclamation (2016). See Chapter IV for more on BioRAM. https://www.ca.gov/archive/gov39/wp-content/uploads/2017/09/10.30.15_Tree_Mortality_State_of_Emergency.pdf and SB 859 https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB859.

III. COMPLIANCE & ENFORCEMENT

This chapter provides an overview of the RPS program's compliance and enforcement[69] and the status of the CPUC's current compliance determinations and enforcement activities. Each August, retail sellers are required to submit annual preliminary Compliance Reports to the CPUC that contain historical and forecasted data on their renewable procurement. The CPUC uses these reports to conduct analysis of LSEs' progress towards the RPS mandate. The reports are necessary for the CPUC to quantify each retail seller's procurement and facilitates determining the compliance status of each retail seller.

Specifically, compliance with the RPS program is measured in eligible RECs[70] and evaluated on a multi-year compliance basis. The CPUC works closely with the CEC to make formal compliance determinations, using the CEC's Verification Report[71] to confirm each retail seller's annual REC claims. The CEC utilizes reports from the Western Renewable Energy Generation Information System (WREGIS)[72] to determine the amount of renewable electricity generated by each 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' annual RPS Compliance Reports in conjunction with the CEC's Verification Report to evaluate compliance.

Components of Compliance

There are three components required to achieve RPS compliance:

- Procurement Quantity Requirement (PQR);
- Portfolio Balance Requirement (PBR); and
- Long-term contracting requirement.

These three components are intertwined such that each retail seller must meet the criteria of all three requirements to be considered compliant with the RPS program.

[69] *See* Appendix A: About the RPS Program.
[70] 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.
[71] *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.
[72] 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 may be tracked through WREGIS and used for state RPS programs.

Procurement Quantity Requirement (PQR)

The PQR is the statutorily[73] set percentage of RPS-eligible procurement required per year in a compliance period. The PQR is multiplied by an LSE's the total retail sales of each year in the 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/MWh.

Portfolio Balance Requirement (PBR)

The PBR is defined by the minimum and maximum of the three portfolio content categories (PCC), which are delineated by type of renewable procurement. The minimum and maximum vary over the initial compliance period.[74]

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.[75]

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.[76] For the first three compliance periods through 2020, 0.25 percent of the retail seller's total electricity portfolio must come from long-term contracts. Beginning in Compliance Period 4 (2021-2024), 65 percent of all RPS procurement must come from long-term contracts.

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. 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.[77]

In 2019, the CPUC made final compliance determinations for Compliance Period 2014 - 2016 and determined that out of 26 retail sellers, three were found to be non-compliant with their RPS procurement obligations, as illustrated in Table 16.

[73] 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.
[74] For more details on the RPS Compliance rules, visit https://www.cpuc.ca.gov/General.aspx?id=3856.
[75] Pursuant to Public Utilities Code § 399.17.
[76] *See* Public Utilities Code § 399.13(b) for additional information.
[77] The six retail sellers include Commercial Energy of CA, Commerce Energy (Just Energy Solutions), Direct Energy Business, Gexa Energy, Liberty Power Holdings, and Tiger Natural Gas.

Table 16: CPUC Compliance Determinations for Compliance Period 2014-2016			
Reporting Retail Seller	**Retail Seller Type**	**Compliant?**	**Total RPS Eligible RECs (%)[78]**
Pacific Gas and Electric	IOU	Yes	29%
Southern California Edison	IOU	Yes	25%
San Diego Gas & Electric	IOU	Yes	38%
Bear Valley Electric Service	SMJU	Yes	23%
PacifiCorp	SMJU	Yes	23%
Liberty Utilities	SMJU	Yes	23%
Marin Clean Energy	CCA	Yes	54%
Sonoma Clean Power	CCA	Yes	39%
Peninsula Clean Energy	CCA	Yes	59%
Lancaster Choice Energy	CCA	Yes	38%
CleanPowerSF	CCA	Yes	41%
3 Phases Renewables	ESP	Yes	29%
Agera Energy	**ESP**	**No**	**-**
Calpine Energy Solutions	ESP	Yes	23%
Calpine Power America	ESP	Yes	23%
Commercial Energy of CA	ESP	No	22%
Constellation NewEnergy	ESP	Yes	25%
Direct Energy Business	ESP	Yes	24%
EDF Industrial Power	ESP	Yes	24%
Gexa Energy CA	ESP	No	-
Just Energy Solutions	ESP	Yes	24%
Liberty Power Holdings	ESP	Yes	24%
Pilot Power Group	ESP	Yes	23%
Shell Energy North America	ESP	Yes	24%
Tiger Natural Gas	ESP	Yes	23%
Regents of University of CA	ESP	Yes	34%

Two of the three retail sellers did not meet the long-term contracting requirement and, therefore, could not count their short-term procurement toward their PQR and the third did not procure enough RECs to meet its requirements.[79] These retail sellers may elect to file for waivers for their respective RPS penalties.[80]

[78] Represents the overall percentage of RECs retired, verified, and applied for the compliance period requirements relative to overall electricity retail sales.
[79] *See* D.17-06-026 for more information on the RPS long-term contracting rules.
[80] California Public Utilities Code § 399.15.

Enforcement

Compliance Period 1

In December 2017, the CPUC issued compliance determination letters to 20 retail sellers operating in Compliance Period 1 (2011-2013). Six entities failed to comply with either the long-term contracting requirement and/or the PQR. Four retail sellers accepted the Commission'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 enforced its RPS Compliance rules for California's electric retail sellers subject to CPUC jurisdiction.[81] The CPUC's August 2019 decision denied two entities' request for waiver of their penalties and required them to pay a cumulative sum of over $2 million.[82] The total penalties collected for Compliance Period 1 were approximately $4.1 million.[83]

Compliance Period 2

In October 2019, the CPUC issued compliance determination letters to 26 retail sellers operating in Compliance Period 2 (2014-2016). Three entities failed to comply with either the long-term contracting requirement and/or the PQR. These entities may choose to either pay the penalties outlined in the letters or request a waiver of their procurement requirement for Compliance Period 2.

[81] Retail sellers subject to the CPUC's compliance and enforcement rules include the IOUs, SMJUs, CCAs, and ESPs.
[82] CPUC Decision (D).19-08-007.
[83] Per Public Utilities Code § 399.15(b)(8), the penalties collected for the RPS program are deposited into the Electric Program Investment Charge fund.

IV. 2019 RPS PROGRAM ACTIVITIES

This chapter identifies and discusses key 2018/2019 RPS activities and accomplishments including implementation of legislation, procurement activities, and interagency planning and coordination.

Implementation of SB 100

On September 10, 2018, SB 100 (de León, 2018) was signed into law by Governor Brown. SB 100 increases the RPS requirements to 60 percent by 2030 and establishes a goal that renewable energy zero-carbon resources supply 100 percent of electric retail sales to California end-use customers by 2045.

In June 2019,[84] the CPUC began implementing SB 100, setting the RPS PQR beginning in 2021. The CPUC determined that the 60 percent RPS PQR would continue indefinitely beyond 2030 and assigned compliance targets for each compliance period.[85] SB 100's goal beyond the 60 percent RPS after 2030 will be examined in the IRP proceeding,[86] in addition to the SB 100 joint agency report process established between CEC, CPUC, and the California Air Resources Board.[87]

IRP and RPS Coordination and Alignment

SB 350 initiated improved coordination between the RPS and IRP proceedings. The CPUC adopted an IRP framework in 2018 to coordinate and refine long-term planning requirements for CPUC-jurisdictional LSEs.[88] Activities in the IRP proceeding are complementary to RPS procurement activities and resource planning for the electric sector. The CPUC has significant flexibility and continues to coordinate between IRP and RPS, both formally and informally, in the areas of planning and reporting requirements where there is substantial overlap.

The CPUC is currently working to align the two proceedings to coordinate planning efforts and address the overlap in reporting requirements. In April 2019, the CPUC proposed a future schedule that will allow RPS Procurement Plans to be incorporated into retail sellers' IRP plans in years when IRP Plans are required. Parties to the RPS proceeding have commented on this schedule, which is currently being considered by the CPUC. A streamlined, coordinated schedule would allow the RPS and IRP proceedings to converge on the same timeline. The next steps will be provided by subsequent CPUC decisions or rulings.[89]

[84] *See* CPUC Decision (D). 19-06-023
[85] As mandated by the amendments to § 399.15(b)(2)(B).
[86] *See* Proceeding R. 16-02-007
[87] *See* https://www.energy.ca.gov/sb100.
[88] *See* CPUC Decision (D).18-02-018
[89] To be issued in R.18-07-003 or R.16-02-007 or subsequent proceedings.

Additional Mandated RPS-Eligible Procurement Activities

The IOUs are required to procure renewable energy through mandated programs to meet other State policy goals. SMJUs, CCAs, and ESPs are not required to procure RPS resources through these mandated programs.

Feed-in Tariff Programs (FIT)

California's 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 in 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)

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

Renewable Market Adjusting Tariff (ReMAT)

The ReMAT[90] 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. ReMAT is an IOU procurement program that provides market-based adjusting prices for small RPS-eligible facilities (generating up to 3 MW),[91] such as small hydro, solar PV, and wind, to sell renewable electricity to utilities under standard terms and conditions. The ReMAT program, however, was suspended on December 15, 2017.[92] To date, the IOUs have collectively procured more than 290 MWs of the total ReMAT program capacity of 494 MWs.[93]

Bioenergy Market Adjusting Tariff (BioMAT)

BioMAT is a FIT program created by SB 1122 (Rubio, 2012), which established a 250 MW procurement program for small-scale bioenergy projects. The program was implemented in 2014[94] and uses a standard contract and a market-based mechanism to arrive at the offered program contract price.

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[90] 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.
[91] 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.
[92] The ReMAT Program was halted by a Federal Court Order by the Northern District Court of California in the case of *Winding Creek Solar LLC v. Peevey, et al.* The Order found that the ReMAT program are not compliant with the Public Utilities Regulatory Policies Act (PURPA). The federal court order was upheld by the Ninth Circuit U.S. Court of Appeals on July 29, 2019: http://cdn.ca9.uscourts.gov/datastore/opinions/2019/07/29/17-17531.pdf.
[93] CPUC RPS Database, September 2019.
[94] *See* CPUC Decision (D).14-12-081.

The goal of the BioMAT program is to promote a competitive market using a simple procurement mechanism for entrants to the bioenergy market. BioMAT allocates procurement to the discrete bioenergy categories of Biogas, Agriculture, and Sustainable Forest Management (Forest). Table 17 shows the BioMAT targets and capacity (MW) procured over the life of the program by the three IOUs.

Table 17: BioMAT Mandated Allocations and MWs Contracted

BioMAT Category	BioMAT MW Allocation	MW Contracted
Biogas	110	13
Dairy/Agriculture	90	17
Sustainable Forest Management	50	11
Total	**250**	**41**

Data Source: CPUC RPS Database, August 2019

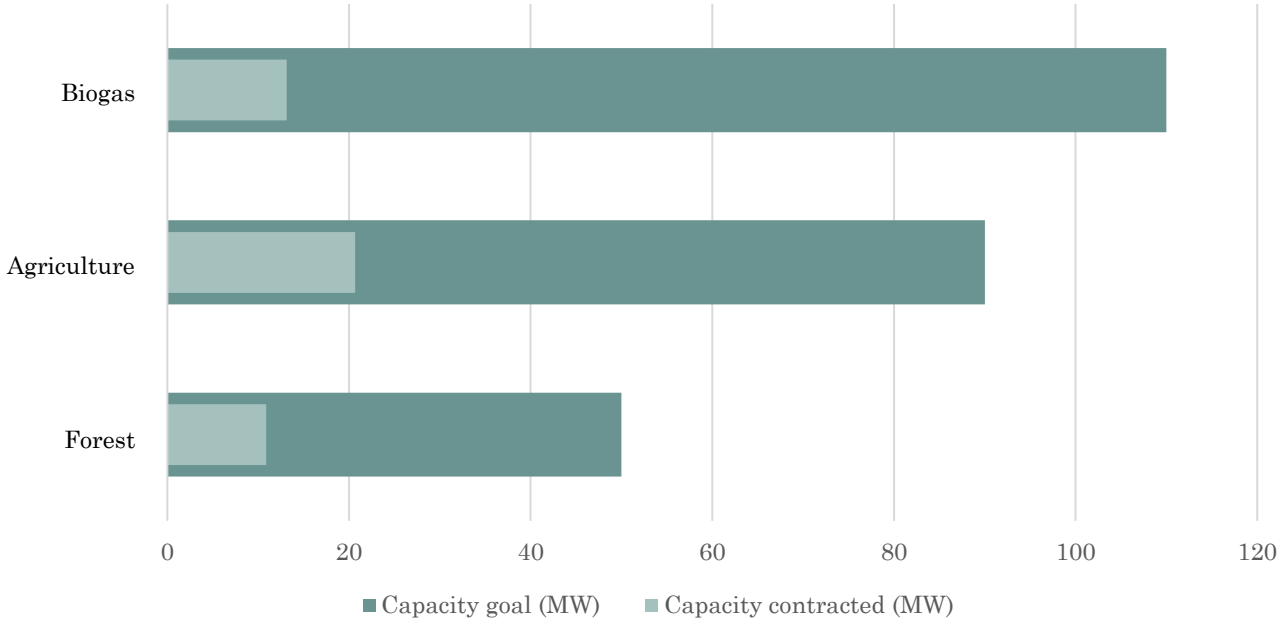
Category 1 (Biogas): From January through June of 2019, one biogas contract was executed by SDG&E for a total of 3.0 MW of capacity. Since the start of the BioMAT program, seven biogas contracts have been executed across the three IOUs for a total of 13.1 MW of capacity. All contracts in this category have been executed at the program starting price of $127.72/MWh.

Category 2 (Agriculture): This category consists of Dairy and Other Agriculture sub-categories. Since the start of 2019, four dairy contracts have been executed by PG&E for a total of 5.4 MWs. One of these projects accepted prices for Dairy contracts, and the three other projects accepted a price in the Other Agriculture sub-category. There have been a total of 14 dairy contract executions in PG&E's and SCE's service territories for a total of 16.7 MW of capacity. All contracts in this category have been executed at a price of $187.72/MWh.

Category 3 (Sustainable Forest Management): Since the beginning of 2019, one Forest contract was executed by PG&E for a total of 3.0 MW. Since the start of the BioMAT program, four Forest contracts have been executed by PG&E for a total of 10.9 MW of capacity. All contract executions in this category have occurred at a price of $199.72/MWh.

Figure 8 shows the progress of the BioMAT program to date compared with targets for each of the three categories.

Figure 8: BioMAT Progress by Category



Data Source: BioMAT Workshop Presentations, July 2019
CPUC 2019 RPS Annual Report (November 2019)

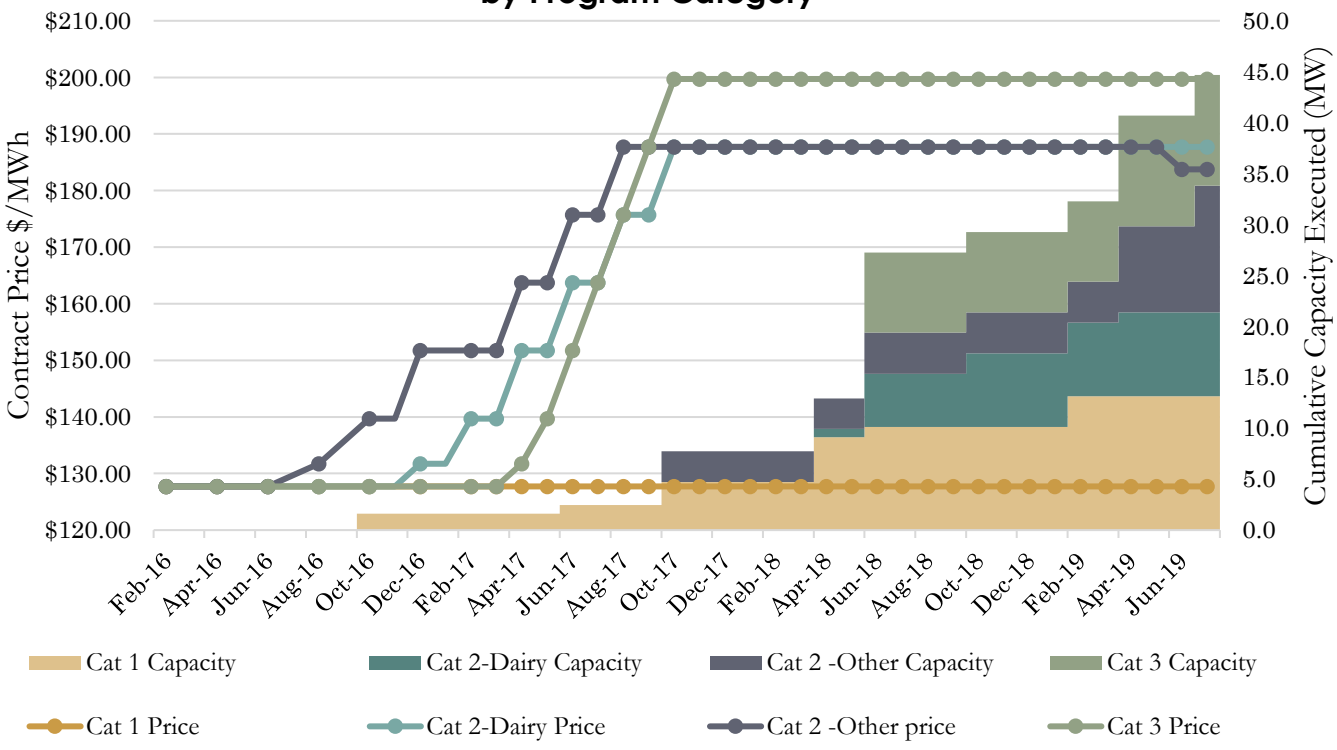
BioMAT Program Review

BioMAT is currently in the midst of a formal program review. In November 2017, the Forest Category offer price surpassed $197/MWh for two consecutive program periods triggering a program review.[95] As a result, the CPUC issued a letter to the IOUs on November 28, 2017, announcing the start of a BioMAT program review and instituting a temporary price cap in the Forest category to prevent the offer price from increasing above $199.72/MWh unless a seller commits to using at least 60 percent High Hazard Zone (HHZ) fuel.[96]

[95] Pursuant to the program rules adopted in the BioMAT Decision, D.14-12-081, Energy Division is required to initiate a program review and is authorized to suspend contracting in certain categories when the soft cap price trigger is reached.
[96] Identified by CALFIRE's Drought Related Tree Mortality Map, High Hazard Zones (HHZ) are areas with elevated tree mortality and high fire threat that are a hazard to public safety, community assets and related infrastructure. Tier 1 HHZs are in close proximity to communities, roads, and utility lines and represent a direct threat to public safety. Tier 2 HHZs are defined by watersheds that have significant tree mortality, combined with community and natural resource assets.

Figure 9 displays the BioMAT program's historical contract prices and executed capacity.

Figure 9: BioMAT Price and Capacity Executed by Program Category



Data Source: BioMAT Workshop Presentations, July 2019
CPUC 2019 RPS Annual Report (November 2019)

In October 2018, the CPUC issued a draft program review proposal to assess BioMAT program performance and recommend programmatic and procedural improvements. The goal of the program review is to simplify the BioMAT procurement process, enable expanded program participation, address program barriers, reduce ratepayer expenditures, and promote statewide goals. The CPUC held a workshop in July 2019 to engage public comment and stakeholder collaboration on potential BioMAT program changes proposed by the CPUC. [97]

[97] For BioMAT workshop materials, visit https://www.cpuc.ca.gov/SB_1122/.

Bioenergy Renewable Auction Mechanism (BioRAM)

In 2016, the BioRAM program used the RAM process to implement a bioenergy program pursuant to Governor Brown's October 2015 Emergency Order Addressing Tree Mortality.[98] Subsequently, SB 859 (Committee on Budget and Fiscal Review, 2016)[99] directed additional BioRAM procurement. BioRAM requires the large IOUs to procure 146 MWs of bioenergy from dead and dying forest trees in High Hazard Zones (HHZ)[100] to aid in mitigating the threat of wildfires.

Table 18 lists the IOUs' BioRAM contracts that comply with the State's emergency orders.

Table 18: Large Investor-Owned Utility BioRAM Procurement Implemented in 2017

IOU	Facility	Location	Capacity (MW)	BioRAM Phase[101]
Pacific Gas and Electric	Burney	Shasta County, CA	29	BioRAM 1
Pacific Gas and Electric	Wheelabrator Shasta	Shasta County, CA	34	BioRAM 2
Southern California Edison	Rio Bravo Fresno	Fresno County, CA	24	BioRAM 1
Southern California Edison	Rio Bravo Rocklin	Placer County, CA	24	BioRAM 1
Southern California Edison	Pacific Ultrapower Chinese Station	Tuolumne County, CA	18	BioRAM 1
San Diego Gas & Electric	Honey Lake Power Company / Greenleaf	Lassen County, CA	24	BioRAM 1
Total			**153**	

Data Source: CPUC RPS Database, October 2019

BioRAM High Hazard Zone Forest Fuel Requirements

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 2019, the IOUs completed audits on each facility's 2018 HHZ fuel usage. Table 19 shows the amount of HHZ fuel used in 2018 as part of BioRAM contracts.

[98] *See* https://www.ca.gov/archive/gov39/wp-content/uploads/2017/09/10.30.15_Tree_Mortality_State_of_Emergency.pdf.
[99] Senate Bill 859 (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), which modifies the HHZ definition and expands flexibility for certain BioRAM facilities that choose to modify their contracts.
[100] For more information on high hazard zone areas, see CALFIRE's website: https://frap.fire.ca.gov/mapping/maps/.
[101] BioRAM categories have subsequently shifted to BioRAM 2 rules pursuant to SB 901.

HHZ fuel usage data for the six BioRAM facilities is aggregated in Table 19.

Table 19: 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)[102]	Total HHZ Usage To-Date (BDT)
2017[103]	50%	54.6%	267,745	267,745
2018	60%	56.5%	671,847	939,592

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

BioRAM Non-Bypassable Charge (NBC)

Senate Bill 859 directed that the costs from BioRAM procurement be allocated to all customers given that there are broad social benefits that are realized from supporting the mitigation of wildfires. In December 2018, the CPUC issued a decision[104] establishing the methodology that will be used to determine total BioRAM costs, including the value of BioRAM RECs and Resource Adequacy.[105] The BioRAM NBC will be allocated to all customers via the Public Purpose Program (PPP) charge on customers' electric utility bills.

Implementation of SB 901 for BioRAM Program Modifications

Senate Bill 901 (Dodd, 2018) amended the BioRAM program to add program flexibility and extend certain contracts by five years. In January 2019, the CPUC issued a Resolution implementing Senate Bill 901 by ordering the IOUs to amend their BioRAM contracts to expand the eligible fuel stock that can be classified as HHZ fuel, offer BioRAM sellers a monthly opt-out and reporting option for annual fuel use requirements, and remove missed fuel requirements as an event of default. The Resolution also ordered the IOUs to seek to extend eligible BioRAM and other biomass contracts by five years.

[102] 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.
[103] The 2017 amount of delivered HHZ fuel has been updated from the 2018 RPS Annual Report to reflect the aggregate HHZ Annual Fuel Verification Reports.
[104] *See* CPUC Decision (D).18-12-003. For all documents pertaining to the BioRAM NBC proceeding, see CPUC Application (A). 16-11-005.
[105] This process allocates the above market costs to all customers. The average BioRAM contract prices for HHZ fuel is approximately $119/MWh in 2018.

High Hazard Zone (HHZ) Fuel Availability Study

In response to stakeholder concerns that BioRAM facilities may be unable to access enough HHZ forest fuel to achieve their contract requirements, the CPUC worked with diverse stakeholders to guide an HHZ Fuel Availability Study (HHZ Study)[106] funded by PG&E. This ad hoc Steering Committee was formed from stakeholder participants in the Governor's Forest Management Task Force and included the CPUC, CAL FIRE, CEC, PG&E, California Biomass Energy Alliance, and the U.S. Forest Service. The purpose of the HHZ Study was to provide an analysis of barriers and costs to accessing HHZ forest biomass fuel for bioenergy facilities.

The HHZ Study identifies certain barriers including the high cost of transporting forest biomass more than 50 miles to a bioenergy facility. The Study finds that biomass for bioenergy is the least valuable portion of the harvested biomass compared to other wood products such as building materials. Accordingly, to expand HHZ forest fuel for bioenergy it would require a corresponding increase in commercial timber demand to support the necessary infrastructure to overcome the barriers. The HHZ Study is a first of its kind and identifies significant data gaps that can provide the basis for guiding subsequent stakeholder studies.

Interagency Program Planning and Coordination

The CPUC coordinates 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, California Independent System Operator, and CAL FIRE on issues and projects such as: statewide RPS compliance and enforcement, wildfire safety and mitigation, offshore wind development, and transmission planning.

Compliance and Enforcement

The CPUC continues to coordinate closely with the CEC to ensure a consistent policy approach for RPS compliance and enforcement. Also, the CPUC depends on the CEC's compliance verification report to inform its RPS compliance determinations. See Chapter III for more details on RPS Compliance.

Bioenergy Issues and Forest Management

The issue of forest health and its impact on wildfire vulnerability 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 state agencies to address program costs and barriers to HHZ tree biomass procurement.

The CPUC participates in regular, ongoing forums that address the State's emergency status due to more than a hundred million dead and dying trees in California since 2010. Specifically, the CPUC is an active participant in the Governor's Forest Management Task Force and RPS staff participate in monthly meetings of the Wood Utilization Working Group.

[106] Forest Management Task Force Website: https://fmtf.fire.ca.gov/media/2180/hhzfuelstudy_final_20190613.pdf.

Offshore Wind Task Force / 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 CPUC procedures as these proceedings will inform procurement need from offshore wind. In January 2019, the CPUC and CEC co-sponsored a letter to the Bureau of Ocean Energy Management (BOEM) in response to BOEM's call for public input on the potential lease sales for development of wind turbines off California's central and northern coasts. The CPUC/CEC letter voiced support for such offshore wind development with the caveat that additional research and data were needed before moving forward. Additionally, the CPUC is considering offshore wind in its IRP process, where the resource is now available for potential selection in the IRP capacity expansion model.[107] In the coming year, the CPUC anticipates continuing to coordinate and work with these interagency groups on marine renewable energy.

Transmission Development Supporting RPS Implementation

Eldorado – Lugo – Mojave Series Capacitor Project

SCE filed an application 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.[108] The project had previously been approved through the CAISO's 2013-2014 Transmission Planning Process. SCE proposes the ELM Project to deliver electricity by late 2021 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 proposal 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 is reviewing Edison's amended application and anticipates issuing a proposed decision in the first half of 2020 to allow time for the required CEQA processes and statutorily required steps in the proceeding.

[107] *See* Proceeding (R).16-02-007.
[108] *See* Application (A).18-05-007.

Summary of July 2018 - October 2019 Accomplishments

July 2018	▪ CPUC issues new Rulemaking (R.18-07-003) for the RPS program ▪ IOUs, CCAs, and ESPs submitted their draft RPS Procurement Plans to the CPUC ▪ PG&E contracted a 75 MW solar PV project
August 2018	▪ IOUs, CCAs, and ESPs submitted their annual preliminary RPS Compliance Reports to Energy Division
September 2018	▪ PG&E issued a solicitation to sell short-term RECs
October 2018	▪ CPUC issued ruling requesting comment on staff proposal related to three components of the least-cost best-fit (LCBF) RPS contract valuation methodology
November 2018	▪ CPUC issued Annual RPS Report to the Legislature: http://www.cpuc.ca.gov/RPS_Reports_Data/ ▪ PG&E executed a BioMAT contract for a total capacity of 2.0 MW ▪ CPUC adopted D.18-11-036 approving SCE's early termination of two geothermal power (Coso) purchase agreements ▪ CPUC adopted D.18-11-004 implementing interconnection rules for BioMAT
December 2018	• CPUC issued Scoping Memo for R.18-07-003 to continue implementation of the RPS program • CPUC adopted D.18-12-003 establishing a non-bypassable charge for costs associated with tree mortality biomass energy procurement ▪ CPUC approved SDG&E REC sales agreements with Peninsula Clean Energy, Direct Energy Business and Sacramento Municipal Utility District for 1,479 GWh ▪ CPUC approved PG&E's REC sales agreements with 11 counterparties for 5,113 GWh of energy plus RECs
January 2019	▪ CPUC issued Draft Resolution E-4977 amending BioRAM contracts consistent with SB 901
February 2019	▪ CPUC issued a final decision on the 2018 RPS Procurement Plans ▪ SDG&E executed a BioMAT contract for a total capacity of 3.0 MW
March 2019	▪ PG&E issued two solicitations to sell short-term RECs, one from its general RPS portfolio and the other related to tree mortality projects ▪ CPUC issued Resolution amending BioMAT, GTSR, and AB 1613 contracts so that PG&E can continue those programs during bankruptcy. PG&E filed for bankruptcy on January 29, 2019.
April 2019	▪ 2018 RPS Procurement Plans filed by five new CCAs ▪ Assigned Commissioner and Assigned Administrative Law Judge's Ruling issued identifying issues and schedule of review for 2019 RPS Procurement Plans

May 2019	▪ CPUC issued the 2019 Padilla Report on Costs and Cost Savings for the RPS Program to the Legislature, pursuant to Public Utilities Code 913.3 ▪ CPUC adopted Resolution E-4996 approving energy plus RECs sale from SDG&E to Clean Power Alliance of Southern California ▪ Joint IOUs submitted Informational-Only Time-of-Delivery (TOD) Proposal pursuant to D. 18-02-003 ▪ PG&E executes BioMAT contracts for a total capacity of 8.4 MW
June 2019	▪ IOUs, CCAs, and ESPs submitted Draft 2019 RPS Procurement Plans
July 2019	▪ PG&E executed BioMAT contracts for a total capacity of 4.0 MW ▪ Workshop held to discuss BioMAT program review ▪ CPUC approved PG&E's REC sales agreements with 12 counterparties for 5,495 GWh of energy plus RECs
August 2019	▪ CPUC adopted D.19-08-007 enforcing RPS program rules by imposing fines on two entities for non-compliance with program requirements ▪ IOUs, CCAs, and ESPs submitted annual RPS Compliance Reports ▪ PG&E filed Advice Letter 5607-E to amend three Solar PV PPAs in advance of seeking to assume the PPAs in its bankruptcy proceeding
September 2019	▪ CPUC adopted D.19-09-043 establishing a standardized methodology for calculating Effective Load Carrying Capability for the three large IOUs ▪ CPUC adopts D.19-09-007 accepting CCAs 2018 RPS Plans
October 2019	▪ SCE executed a BioMAT contract for a total capacity of 2.7 MW ▪ Energy Division issued compliance determination letters to all IOUs, CCAs, and ESPs operating in RPS Compliance Period 2 (2014-2016)

V. RPS WORKFORCE DEVELOPMENT AND DIVERSITY

As California continues to implement its robust RPS program and develop comprehensive climate change policies, all sectors of the economy are demanding an educated and qualified "green tech" workforce. This chapter describes RPS workforce development activities of the IOUs, SMJUs and CCAs, consistent with Public Utilities Code 913.4(f).[109]

This chapter provides details on workforce development related to retail sellers' current RPS workforce, training, diversity of staff, strategies used proactively to recruit and develop a diverse staff of the future, and training provided for their current and future workforce. To provide this overview, the CPUC collected information on workforce development topics directly from the IOUs, SMJUs, and CCAs.

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 20 and Figure 10 provide an overview of the number of full-time PG&E, SCE, and SDG&E employees who worked on RPS-related issues from 2013 - 2019.

Table 20: Total RPS Employees at Large Investor-Owned Utilities

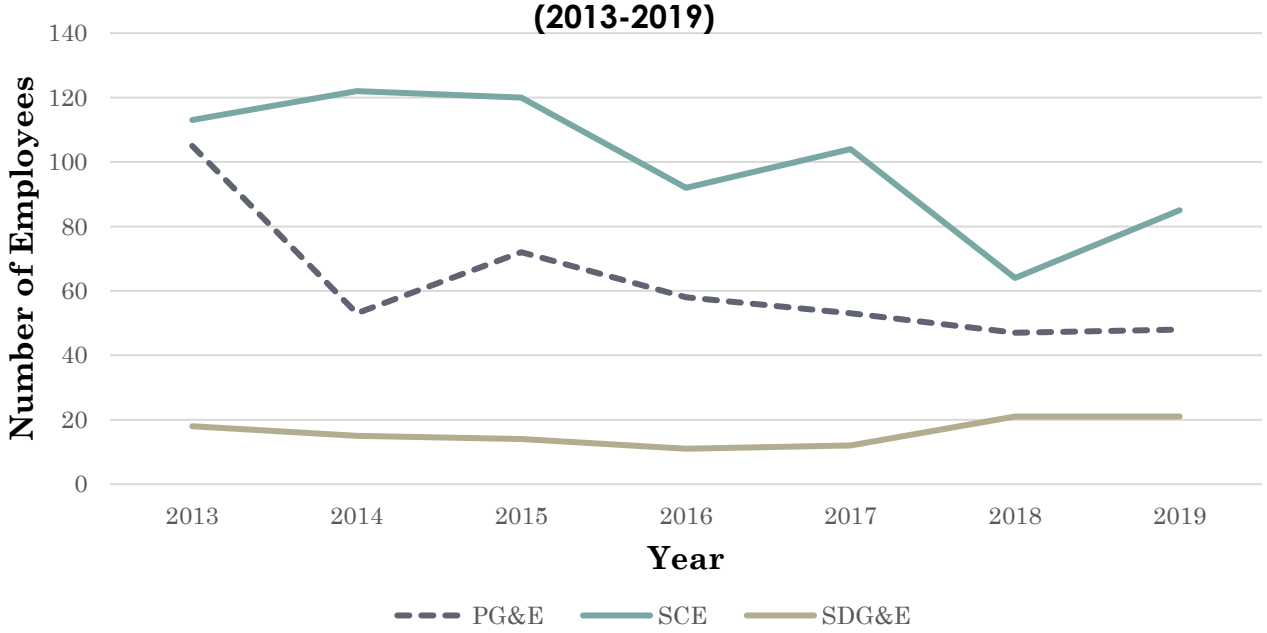
	2013	2014	2015	2016	2017	2018	2019
Totals	236	190	206	161	169	132	154

Data Source: PG&E, SCE, SDG&E, July 2019

[109] Public Utilities Code 913.4(f) applies to LSEs and the reporting in this chapter does not reflect the workforce development and diversity efforts of renewables project developers.

Figure 10 illustrates how the IOUs' RPS employees have changed over the past seven years.[110]

Figure 10: Full-Time RPS Employees at Large Investor-Owned Utilities (2013-2019)



Data Source: PG&E, SCE, SDG&E, July 2019
CPUC 2019 RPS Annual Report (November 2019)

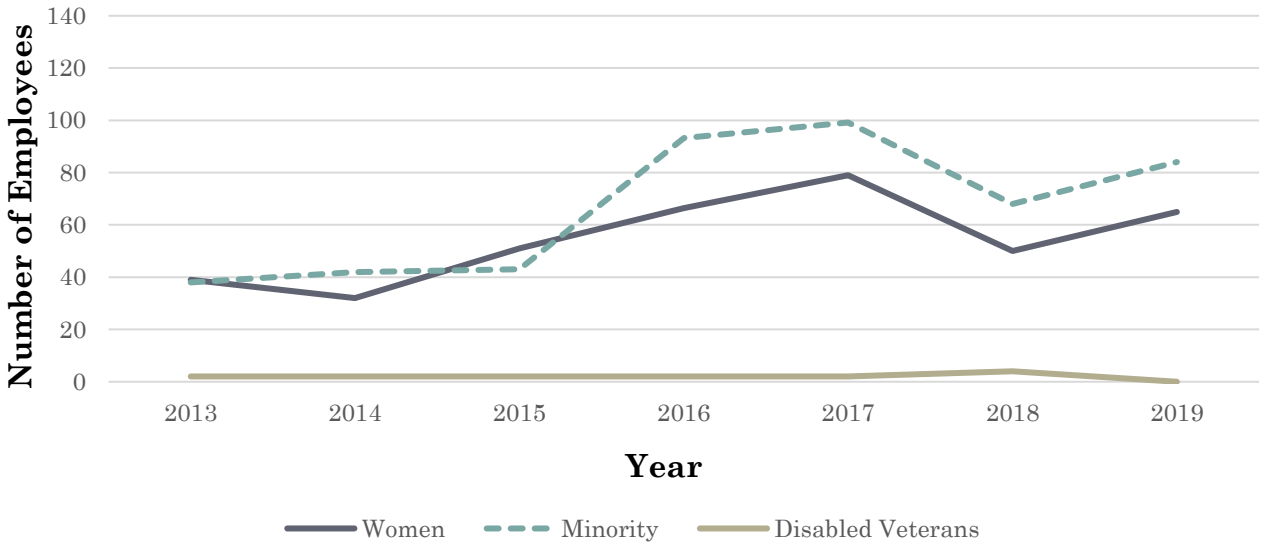
IOU Current RPS Workforce Diversity

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 2019, all three large IOUs reported working with organizations that focus on professional development for women, minorities, and disabled veterans.[111]

[110] This time series data is current as of August 2019 and includes employment data from January 2013 through July 2019.
[111] 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. IOUs were compliant with General Order 156 requirements on Supplier Diversity. https://www.cpuc.ca.gov/supplierdiversity/.

Figure 11 illustrates aggregated data on the number of women, minorities, and disabled veterans who are full-time employees who work on the RPS program at the three large IOUs.[112]

Figure 11: Total Women, Minority, and Disabled Veteran Employees at Large Investor-Owned Utilities (2013-2019)



Data Source: PG&E, SCE, SDG&E, July 2019
CPUC 2019 RPS Annual Report (November 2019)

Pacific Gas and Electric Company (PG&E):

Table 21 shows the number of PG&E's RPS employees who are women, minorities, and disabled veterans compared with total PG&E RPS staff. In 2019, 65 percent of PG&E's RPS staff was comprised of women and/or minorities. PG&E did not execute an RPS contract with a minority owned business enterprise in 2019.

[112] 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 women or female disabled veterans) and their time may be distributed between the RPS program and other non-RPS functions.

Table 21: Pacific Gas and Electric's Women, Minority, and Veteran RPS Employees from 2013-2019							
	RPS Employees (Full-Time)						
	2013	2014	2015	2016	2017	2018	2019
Women	39	20	36	13	27	19	20
Minority	37	35	32	28	29	22	24
Veterans[113]	2	2	2	2	2	n/a[114]	n/a
Total RPS Staff	105	53	72	58	61	47	48

Southern California Edison (SCE):

SCE reported that 47 percent of the company's RPS employees are women and 65 percent identify as minorities. Table 22 below shows the number of SCE's RPS employees that are women, minority, or disabled veterans. In 2019, approximately 78 percent of SCE's total RPS staff was comprised of women or minorities. SCE did not execute an RPS contract with a minority owned business enterprise in 2019.

Table 22: Southern California Edison's Women, Minority, and Disabled Veteran RPS Employees from 2013-2019							
	RPS Employees (Full-Time)						
	2013	2014	2015	2016	2017	2018	2019
WMDV[115]	73	81	84	69	97	48	66
Women	No Data				38	27	40
Minority	No Data				59	40	55
Total RPS Staff	113	122	120	92	97	64	85

[113] In past reporting years, PG&E reported two U.S. military veteran employees working on the RPS Program but neither reported having a disability.
[114] PG&E no longer tracks disabled veterans as a separate reporting category.
[115] Women Minority and Disabled Veterans (WMDV) were tracked as one data point by SCE until 2016. Disabled veterans are not being tracked as separate data points.

San Diego Gas & Electric Company (SDG&E):

Table 23 illustrates the number of SDG&E'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), while the WMDV information is calculated based on whether the employee is a woman, minority, or disabled veteran. Accordingly, the number of women and minority employees is greater than the number of total RPS staff, given that an employee can fall under multiple reporting categories and their time dedicated to the RPS program may range from 0 to 100 percent.

Table 23: San Diego Gas & Electric's Women, Minority, and Disabled Veteran RPS Employees from 2013-2019

	RPS Employees (Full-Time)						
	2013	2014	2015	2016	2017	2018	2019
Women	No Data	12	15	13	14	10	11
Minority	No Data	7	11	11	11	12	11
Disabled Veterans	No Data				2[116]	n/a	n/a
Total RPS Staff	18	15	14	11	12	21	21

SDG&E reported having one RPS contract in 2019 with a minority owned business enterprise. SDG&E uses a qualitative component when evaluating contracts to determine which projects are the best fits for its portfolio. This qualitative component includes the Diverse Business Enterprise (DBE) status of a project and SDG&E has reported strongly encouraging DBEs, including women-owned, minority-owned, disabled veteran-owned, or LGBT-owned business enterprises to participate in its renewable power related Request for Offer solicitations.

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

General Outreach:

As part of its broad recruiting efforts, PG&E utilizes online job boards to advertise to prospective external candidates.

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

Diverse Employee Recruitment:

PG&E works with groups such as the Society of Women Engineers, National Society of Black Engineers, Society of Hispanic Professional Engineers, and specific university programs to encourage a diverse candidate pool. In addition, PG&E has a Women in Trades initiative to support diverse candidate pools for trade-specific positions. PG&E does not have a formal company policy outlining diversity strategies for program such as RPS.

University Outreach:

PG&E has a "University Programs" team primarily focused on collegiate recruitment from California campuses. The University Programs team targets candidates majoring in engineering and information technology for both internships and regular full-time entry-level training positions.

Special Programs:

PG&E designed and manages an external training program, PowerPathway, which partners with local workforce development community agencies to design and deliver training programs. Participation in these programs improves access to skilled trades job opportunities for those in historically underserved communities. In addition, the programs provide up to three years of career coaching for program graduates.

SCE

General Outreach:

As a part of its targeted recruitment efforts for clean-energy professionals, SCE recruits through online job sites such as LinkedIn, CareerBuilder, Indeed, Direct Employers, and Glassdoor. With regards to college recruitment, SCE has reported robust recruitment efforts and outreach strategies targeted at students pursuing undergraduate degrees in engineering, accounting, finance, information technology, and cyber security.

SCE leverages social media, including hosting a YouTube channel where it posts videos for the public on a variety of topics including the electricity grid of the 21st century, updates on renewable energy project development, safety, and grid reliability. SCE also recently launched the SCE Talent Network in order to stay connected with prospective candidates.

Diverse Employee Recruitment:

SCE employees are members of several professional associations including the Society of Women Engineers, Society of Hispanic Professional Engineers, National Society of Black Engineers, American Association of Blacks in Energy, Asian American Professional Association, and Iranian American Women's Foundation. These associations allow SCE employees to engage in professional networking which helps support their career development goals. SCE job openings are also promoted within these organizations.

SCE promotes job opportunities to military veterans through several partner organizations such as U.S. Vets. SCE attends several annual veteran job recruitment events, which include transitioning military job fairs. In addition, SCE's recruitment efforts include connecting with and supporting job seekers with disabilities. SCE is a member of the U.S. business leadership network of Disability:IN, a business-to-business national membership organization that focuses on sharing and developing strategies for inclusion of people with disabilities in the workplace. In 2018, SCE implemented a military translator tool that uses military codes to better align with Edison jobs. This allows military/veterans to more easily translate their acquired skills to open positions with Edison.

University Outreach:

SCE actively recruits and employs interns from nine California State Universities, six University of California schools, and five private colleges and universities. SCE has also created a rotational development program for MBA students and partners with Cal Poly Pomona's Open University to help prepare interested students for energy careers. Several of the instructors for the Energy Planner Certification program at Cal Poly Pomona's Open University are SCE employees. While SCE's partner schools are mostly California-based, SCE attracts undergraduate and graduate students nationwide and also work with organizations such as TELACU (The East Los Angeles Community Union), Great Minds in STEM, and MESA (Mathematics Engineering Science Achievement) in order to attract a diverse group of early career talent.

In 2018 and 2019, SCE employed 55 interns from California Polytechnic University Pomona, where 13 of those interns have become full-time employees. In addition, SCE's summer internship program typically has approximately 150 interns.

K-12 Outreach and Education:

SCE's Speakers Bureau is comprised of employees who volunteer to educate and inform customers on a variety of topics related to electricity. SCE offers multilingual speakers who are available to present to service clubs, schools, businesses, faith-based organizations, and senior and consumer groups. The Speakers Bureau conducts a Kids Safety presentation on electrical safety presented to students from K-12. From July 2018 through June 2019, approximately 1,000 to 1,500 students participated in these presentations and an additional 2,000 students participated in general safety messaging.

SDG&E

General Outreach:

SDG&E's recruitment and workforce development efforts center on targeting students primarily from universities in California, Arizona, and Nevada who are studying accounting, finance, engineering, and information technology. SDG&E reports that it uses LinkedIn to advertise job vacancies and participates on group pages to recruit qualified candidates for open positions.

Diverse Employee Recruitment:

As a part of its workforce development and recruitment efforts, SDG&E partners with universities that have a high minority student population such as Howard University, San Diego State University, California Polytechnic University Pomona, and the University of Nevada, Las Vegas. In addition, SDG&E recruits from diverse professional development organizations including the Society of Women Engineers, National Society of Black Engineers, and the Association of Latino Professionals in Finance and Accounting (ALPFA). SDG&E also leverages social media websites focused on professionals in energy with diverse backgrounds such as Getting Hired, National Association of Women in Construction (NAWIC), and Hispanics in Energy.

K-12 Education and University Outreach:

SDG&E offers a workforce education and training program for K-12 students interested in green energy, science, technology, engineering, and mathematics (STEM) careers. From July 2018 through September 2019, approximately 12,000 K-12 students completed the program.

In 2019, SDG&E supported a paid internship program with UC San Diego and Southwestern College designed to prepare students for clean-energy careers with career pathways, such as solar design and energy storage.

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.

Bear Valley Electric Service (BVES):

In 2019, approximately 67 percent of BVES's total RPS staff was comprised of women and minorities. Table 24 below shows the number of BVES's RPS employees who are women, minority, or disabled veterans.

Table 24: Number of Women, Minority, and Veteran RPS Employees from 2017-2019 (Bear Valley Electric Service)

	2017	2018	2019
Women	4	4	1
Minority	4	4	1
Disabled Veterans	0	0	0
Total RPS Staff	11	13	3

Data Source: Bear Valley Electric Service, July 2019

BVES did not execute an RPS contract with a minority owned business enterprise in 2019.

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:

In 2019, approximately 46 percent of Liberty's total RPS staff was comprised of women and minorities. Table 25 below shows the number of Liberty's RPS employees that are women, minority, or disabled veterans.

Table 25: Number of Women, Minority, and Disabled Veteran RPS Employees from 2017-2018 (Liberty Utilities)

	2017	2018	2019
Women	2	2	3
Minority	0	2	3
Disabled Veterans	0	0	0
Total RPS Staff	9	11	13

Data Source: Liberty Utilities, July 2019

Of the three SMJUs, Liberty is the only utility to engage in recruitment efforts with local high schools and universities. Liberty offers scholarships to graduating high school students within the service territory and offers one annual community college scholarship.

Liberty stated that it is an equal opportunity employer and is committed to ensuring an equal and diverse workforce to implement the RPS program. In May 2019, Liberty hired an additional minority recruit to assist in RPS implementation.

PacifiCorp:

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 one person to work on RPS, but it did not provide specific diversity statistics.

CCA Workforce Development

The CPUC requested data from all 19 CCAs that were operational in 2018. 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 26 shows the amount of total RPS employees at each CCA in response to the CPUC's data request.[117]

Table 26: Total Number of RPS Employees 2018 – 2019 (Community Choice Aggregators)

	2018	2019
Apple Valley Choice Energy	1	1
Clean Power Alliance	2	3
CleanPowerSF	3	5
East Bay Community Energy	1	1
King City Community Power	1	1
Lancaster Choice Energy	1	1
Marin Clean Energy	56	57
Monterey Bay Community Power[118]	1	1
Peninsula Clean Energy	6	6
Pico Rivera Innovative Municipal Energy	2	2
Pioneer Community Energy[119]	n/a	n/a
Rancho Mirage Energy Authority	1	1
Redwood Coast Energy Authority	6	6
San Jacinto Power	1	2
San Jose Clean Energy	2	4
Silicon Valley Clean Energy	4	5
Solana Energy Alliance	1	1
Sonoma Clean Power	6	6
Valley Clean Energy Alliance	0	0
Total RPS Staff	95	103

Data Source: AVCE, CPA, CPSF, EBCE, KCCP, LCE, MCE, MBCP, PCE, PRIME, Pioneer, RMEA, RCEA, SJP, SJCE, SVCE, SEA, SCP, and VCEA, 2019

[117] The CCAs have varying interpretations of the data request categories and, therefore, reported RPS employees may not be directly comparable across the 19 CCAs and the IOUs.
[118] MBCP's reported RPS employees represents employees involved in RPS-related procurement and compliance, but not RPS contract review and execution.
[119] Pioneer Community Energy is mostly staffed with employees of the County of Placer at the time of this report.

In 2019, the CCAs reported engaging in business and workforce initiatives located in low-income and disadvantaged communities. Table 27 illustrates aggregated data on the number of women, minorities, and disabled veterans who are full time employees at the CCAs who work on the RPS program.

Table 27: Total Number of Women, Minority, and Disabled Veterans RPS Employees from 2018 – 2019 (Community Choice Aggregators)

	2018	2019
Women	49	45
Minority	24	23
Disabled Veterans	No Data	No Data
Total RPS Staff	95	103

Apple Valley Choice Energy (AVCE):

AVCE is a member of California Choice Energy Authority (CalChoice), a joint powers authority (JPA) that provides operational and procurement services for CCA programs. AVCE asserts that it will exceed RPS requirements which will likely support increased demand for renewable energy products and growth for employment opportunities within California's renewable energy sector as a result of AVCE's procurement activities.

Clean Power Alliance (CPA):

CPA is made up of geographically and socioeconomically diverse members and intends to build a staff reflecting that diversity in its hiring practices. CPA states that it is an equal opportunity employer and actively seeks a diverse pool of candidates for all positions. CPA's recruitment and outreach for potential employees is based on each candidate's qualifications and work experience for particular roles, not on any specific demographic targets or strategies. CPA staff whose job duties include RPS related activities are encouraged to educate themselves on the California RPS program through self-study.

CPA reported that it has recently entered into two long-term contracts for new eligible renewable energy projects in California which will contribute to approximately 500 new union construction jobs over the next several years. CPA itself currently has limited operations with 17 employees and at this point does not track employment statistics.

CleanPowerSF (CPSF):

CPSF currently has five full-time employees who work on the RPS program. CPSF's staff training on RPS-related issues includes sending analysts to energy and procurement conferences, ensuring staff review legal and regulatory requirements, reviewing with staff policies of CPSF on renewable energy development and procurements.

CleanPowerSF states it has entered into long-term contracts for three new renewable resources that will support new union construction jobs which include the San Pablo Raceway solar project, Voyager Wind IV wind project, and the Blythe IV solar project. CleanPowerSF believes the San Pablo Raceway project will include 10 full-time operations-related positions and approximately 500 short-term construction jobs and that the Voyager Wind IV project will have six full-time positions and at its peak, approximately 100 short-term construction jobs. The Blythe IV project will have one full-time operations-related position and approximately 150 short-term construction jobs.

East Bay Community Energy (EBCE):

EBCE states that it is an equal opportunity employer and strives to ensure its recruiting activities reach a broad audience. EBCE reports that its outreach strategies include placement of employment opportunities on EBCE's "Join Our Team" web page; advertisements during EBCE outreach events and trade conferences; placement on job search websites that reach local, state, and national audiences, such as Indeed.com, LinkedIn, and Idealist.org; outreach through industry associations such as CalCCA; and outreach via platforms that reach women, people of color, and veterans, including the Women's Environmental Network, Women in Solar Energy, American Association of Blacks in Energy, Asians in Energy, Hispanics in Energy, Swords to Plowshares, local community-based organizations, and chambers of commerce.

EBCE has hired a procurement team that is experienced and understands the requirements of the State RPS program. EBCE employees are also encouraged to reference the resources available on the CPUC's website, monitor RPS-related regulatory matters, and attend industry conferences.

EBCE continues to hire full-time staff to assess and implement the RPS programs. Additionally, EBCE contributes to employment growth through its recently signed long-term power purchase agreements with three new in-state renewable energy projects that are currently under development.

King City Community Power (KCCP):

KCCP has partnered with Pilot Power Group (PPG), Inc. an existing ESP and states that PPG already has experienced employees that assist in the procurement and regulatory needs on behalf of KCCP.

Lancaster Choice Energy (LCE):

LCE is also a member of CalChoice, which provides operational and procurement services for CCA programs. CalChoice has provided training to LCE staff regarding applicable elements of California's RPS program. LCE asserts that it will exceed RPS requirements which likely supports increased demand for renewable energy products growth in employment opportunities within California's renewable energy sector as a result of LCE's procurement activities.

Marin Clean Energy (MCE):

MCE currently employs a full-time staff of 57 employees across eight teams: Power Resources, Public Affairs, Customer Programs, Legal and Policy, Information Technology, Finance, Human Resources, Diversity, Equity and Inclusion, and Administrative Services. While MCE's Power Resources and Legal and Policy teams focus more directly on legal and regulatory compliance with the RPS program, all of MCE's teams contribute to regulatory engagement, legal review, power procurement, community outreach, development of customer programs to reduce energy consumption, and administrative services' development of metrics and processes to track MCE's workforce and supplier diversity efforts.

MCE offers its employees an annual professional development budget to attend conferences and trainings to keep skillsets and knowledge current. Since 2015, MCE estimates that over 55 employees have undergone training sessions on California's RPS program as part of the on-boarding training at MCE. MCE's new California renewable energy projects support direct construction labor jobs in California. MCE's activities also support indirect construction-related California jobs.

Monterey Bay Community Power (MBCP):

MBCP states that it is an equal opportunity employer that strives for diversity in its hiring practices. Its outreach practices are general and not based on specific demographics. MBCP's staff, whose workload includes RPS-related activities, are well-versed on the details of California's RPS program. MBCP, in partnership with SVCE, currently has under contract two utility scale solar plus storage projects in Kings and Kern counties. In addition, MBCP and SCVE issued another joint RFO in 2019 seeking more California-based renewable projects. Further, MBCP issued an RFO to develop microgrid(s) in its territory. MBCP believes that these projects will lead to job creation in California.

Peninsula Clean Energy (PCE):

PCE reports that it engages in a variety of activities to ensure open employment positions reach as broad an audience as possible. Those strategies follow PCE's Inclusive and Sustainable Workforce Policy, which includes placing information on open employment positions on PCE's website, the San Mateo County employment website, and general job search websites that reach local, state and national audiences; outreach to CCA-related organizations who maintain email newsletters or websites containing employment opportunities, outreach to energy-related organizations that maintain email newsletters or websites containing employment opportunities, and university employment sites. PCE has engaged in no specific RPS-related training of its procurement staff. PCE has hired a procurement team that is experienced and understands the requirements of California's RPS program.

PCE has two new renewable energy facilities under contract to fulfill RPS requirements and PCE's overall energy supply needs. Mustang Solar Power Project is a 100 MW solar facility located in Kings County (subject to a project labor agreement with Operating Engineers Local 3, Northern California Carpenters Regional Council, Laborers Local 294, IBEW Local 100, and Ironworkers Local 155). PCE anticipates the project will support 350 jobs during peak construction. Wright Solar Park is a 200 MW facility located in

Merced County (subject to a project labor agreement with IBEW Local 100 and 684, Ironworkers Local 155, Engineers Local 3). PCE anticipates the project has supported, and continues to support, 350 jobs in 2018-2019.

Pico Rivera Innovative Municipal Energy (PRIME):

PRIME is a member of CalChoice, which provides operational and procurement services for CCA programs. CalChoice has provided training to PRIME staff regarding applicable elements of California's RPS program. PRIME asserts that it will exceed RPS requirements which supports increased demand for renewable energy products growth in employment opportunities within California's renewable energy sector as a result of PRIME's procurement activities.

Pioneer Community Energy:

Pioneer has a very small staff, most of whom are employees of the County of Placer. Pioneer is in the early stages of negotiating its first RPS contracts and has outsourced all RPS procurement activities to external consultants and attorneys, including support for development, compilation, and submission of Pioneer's compliance materials related to the California RPS program.

Rancho Mirage Energy Authority (RMEA):

RMEA is a member of CalChoice, which provides operational and procurement services for CCA programs. CalChoice has provided training to RMEA staff regarding applicable elements of California's RPS program. RMEA asserts that it will exceed RPS requirements which likely supports increased demand for renewable energy products growth in employment opportunities within California's renewable energy sector as a result of RMEA's procurement activities.

Redwood Coast Energy Authority (RCEA):

While no new RPS-focused positions were created at RCEA during 2018 – 2019, two separate recruitment efforts were held to backfill positions that became open due to staff turnover in RCEA's Community Choice Energy (CCE) program, which oversees compliance with RPS requirements. To recruit from as broad a pool of potential candidates as possible, RCEA sent job announcements to a wide array of job boards, websites, and individuals in the energy, engineering, and environmental fields.

RCEA does not provide its staff with formal training focused specifically on California's RPS program. RCEA recently made its first hire during the 2018-2019 reporting period of new staff to assist with RPS activities. This new staff member will receive informal training on their job duties, which will include RPS procurement documentation and RPS compliance reporting.

RCEA's power procurement to date includes PPAs with two RPS biomass facilities within RCEA's service area. Operators of these plants estimate that RPS power contracts have preserved a total of 47 jobs at their

facilities. As of this reporting date, RCEA is currently negotiating PPAs for new renewable energy projects that are estimated by their developers to generate 600 construction-phase jobs and 17 permanent jobs.

San Jacinto Power (SJP):

SJP is a member of CalChoice, which provides operational and procurement services for CCA programs. CalChoice has provided training to SJP staff regarding applicable elements of California's RPS program. SJP asserts that it will exceed RPS requirements which likely supports increased demand for renewable energy products growth in employment opportunities within California's renewable energy sector as a result of SJP's procurement activities.

San Jose Clean Energy (SJCE):

SJCE uses recruitment and outreach strategies to hire general procurement staff through various media and outreach avenues, including the City of San Jose job board, Cal-CCA.org, CalOpps, LinkedIn, Twitter, Facebook, Instagram, and the Learn Energy website. SJCE's general procurement staff develops and implements SJCE's strategies and activities related to the California RPS program.

SJCE's staff training on RPS-related issues includes sending staff to energy and procurement conferences and matching new staff with a manager or senior member with RPS experience for mentoring and training purposes. The eight full-time employees that work on RPS-related issues have attended training courses provided by the California Independent System Operator, Northern California Power Agency, American Public Power Association and various industry conferences.

SJCE is currently collaborating with EBCE on a new 200 MW solar project in Fresno county. SJCE reports that it received City Council authority on June 4, 2019 to enter into over $1 billion in long-term PPAs for new renewable projects which it believes will lead to the creation of new union construction jobs in California. SJCE also issued a solicitation for long-term renewable projects and is evaluating proposals that it states would create additional construction and renewable energy jobs in California.

Silicon Valley Clean Energy (SVCE):

SVCE does not conduct recruiting or training specifically for the purposes of implementing the RPS program. RPS-related activities are carried out by SVCE's general procurement staff. SCVE asserts that its current and planned RPS-eligible procurement contribute to the creation of employment opportunities in a variety of sectors related to renewable energy supply in California

Solana Energy Alliance (SEA):

SEA contracts with The Energy Authority (TEA) to provide operational and procurement services for their CCA program, including providing support in preparing and submitting requisite compliance materials related to the RPS program. SEA asserts that it will exceed RPS requirements which likely supports increased

demand for renewable energy products growth in employment opportunities within California's renewable energy sector as a result of SEA's procurement activities.

Sonoma Clean Power (SCP):

SCP states that it is an equal opportunity employer that strives for diversity in its hiring practices. Its outreach is general and is not based on specific demographics. SCP's staff whose workload includes RPS-related activities are encouraged and guided to educate themselves on the details of California's RPS program. While SCP's physical RPS projects may contribute to job creation, SCP itself is a small startup of 22 full-time employees, and it does not track statewide employment statistics.

Valley Clean Energy Alliance (VCEA):

VCEA is an equal opportunity employer that strives for diversity in its hiring practices. Its outreach is general and not based on specific demographics. VCEA currently has one full-time employee and two interns. VCEA has entered into a contract with Sacramento Municipal Utility District (SMUD) to provide wholesale energy, customer care and marketing, and financial and internal operation contract services. VCEA's staff whose workload includes RPS-related activities are encouraged and guided to educate themselves on the details of the California RPS program.

VI. RPS CHALLENGES AND POLICY RECOMMENDATIONS

Public Utilities Code § 913.4 requires the CPUC to identify barriers to achieving the RPS targets and to propose recommendations to address those barriers. This chapter examines 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 the areas of procurement planning, end-of-life management, long-term contracting requirements, impacts of renewables integration, and jurisdictional issues.

Challenge 1: Procurement Information Gaps

Issue: With the proliferation of new LSEs causing increased load departure from IOU service, renewable procurement is becoming increasingly disaggregated. There are currently 19 CCAs operating in California. An additional eight certified CCAs are expected to come online in 2020 – 2021, with several other local regions considering becoming certified CCAs. Further, due to the passage of SB 237 (Hertzberg, 2018), direct access procurement will be expanding[120] and further expansion will be studied by the CPUC. This new consumer choice landscape in California creates a more complex paradigm for assessing both system reliability and whether California is on-track to achieve its climate goals.

While CCAs and ESPs are subject to the same annual RPS Procurement Plan (RPS Plans) requirements as required by the IOUs, recent RPS Plans show that many CCAs and ESPs continue to provide minimal information in their RPS Plans. Some LSEs' RPS Plans have improved immensely, but many others rely on limited, superficial information using generic boilerplate language found across multiple LSE filings, as compared with the highly detailed IOU procurement plans that provide the State with a clear picture of how they will procure and address risk and reliability in their RPS portfolios. Thus, the CPUC does not receive a comprehensive statewide overview of forecasted procurement by CCAs and ESPs, which serve an increasingly larger portion of load in California. Accordingly, RPS Procurement Plans reveal significant gaps in data that would better enable the CPUC to perform its role to assess RPS program progress, address system reliability, and LSE progress towards meeting the State's ambitious climate goals.

Recommendation: In the 2018 RPS Procurement Plan Decision, the CPUC informed LSEs that filings with scant data would no longer be accepted in the future. The CPUC further issued a ruling in April 2019 setting forth clear requirements for detailed information mandated by statute and necessary to achieve the State's goals of a reliable system and 100 percent zero-carbon resources by 2045. The CPUC can continue to define clear standards to obtain that information it needs to meet the State's climate and reliability mandates and seek penalties if inadequate filings persist.

[120] *See* Direct Access Proceeding R.19-03-009.

Challenge 2: Addressing End-of-Life Management of Decommissioned Technologies Supporting RPS Programs

Issue: Since the RPS Program was established in 2002, more than 500 solar PV and more than 150 wind projects have been developed resulting in over 20,000 MW of cumulative renewable energy capacity.[121] As some of the early RPS systems reach their end-of-life, the State must begin to address the related aspect of end-of-life collection, handling, and reuse or recycling of renewable technology materials. First-generation PVs that have reached their end-of-life are currently being amassed in warehouses while wind turbine blades have limited opportunities for material reuse. In the future these retired technologies may be disposed of in landfills, which is counter to California's waste diversion and producer responsibility goals.

In the case of PVs, material changes that utilize less rare metals result in less valuable material recovery from obsolete products. This improved production process has resulted in lower costs and reduced GHGs, but also decreased economic value that manufacturers and developers may attribute to recycling materials. As production costs of renewable energy products decrease, it will be less cost-effective for manufacturers to retrieve and recycle obsolete products than to manufacture new products for deployment. The Institute for Energy Research has acknowledged the "Mounting Solar Panel Waste Problem,"[122] and the Department of Toxic Substances Control (DTSC) is addressing the issues of handling waste materials from renewable energy technologies by developing end-of-life regulations to improve waste management of photovoltaics.[123] For decommissioned wind turbines, most of the turbine's parts can be recycled or sold currently, but the blades made from resin and fiberglass have limited material value and are especially difficult to transport to landfills.

Recommendation: The CPUC should continue to coordinate with sister agencies to address end-of-life waste issues. In January 2019, the CPUC and CalRecycle signed a memorandum of understanding (MOU) to cooperatively developing consistent approaches to waste generated by PV panels, electric vehicle batteries, energy storage batteries, and related equipment, such as inverters.[124] The MOU outlines agencies' shared priorities and responsibilities for the reuse or recycling of end-of life materials. In April 2019, the agencies hosted a joint workshop addressing the end-of-life management for PV panels and batteries for electric vehicles and energy storage.[125]

The CPUC should continue to work toward the shared goals and priorities outlined in its MOU with CalRecycle. This includes the exploration of additional opportunities to advocate for improved end-of-life management of materials used to support RPS programs. The CPUC is supportive of DTSC and CalRecycle's rulemaking efforts in the near-term and aims to work more closely with other California agencies and stakeholders to align CPUC regulations with appropriate waste management procedures and prudent environmental stewardship principles. The adoption of regulations that provide for the proper

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[121] *See* RPS Database dated September 2019 at https://www.cpuc.ca.gov/RPS_Reports_Data/.
[122] IER. https://www.instituteforenergyresearch.org/renewable/solar/the-mounting-solar-panel-waste-problem/amp/.
[123] DTSC https://dtsc.ca.gov/photovoltaic-modules-pv-modules-universal-waste-management-regulations/.
[124] http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/CPUC%20%20CalRecycle_MOU_Fully%20Exctd_1-8-19.pdf.
[125] Event details, including the agenda and media advisory. https://www.cpuc.ca.gov/calEvent.aspx?id=6442460757.

waste management of renewable energy materials are aligned with the State's goals to reduce GHG emissions and landfill waste and can provide support for the development of new infrastructure and jobs within California. CPUC research programs, such as EPIC, should consider developing initiatives to address lifecycle impacts like waste and reuse.

Challenge 3: Meeting the Long-Term Contracting and RPS Requirements

Issue: Senate Bill 350 (de León, 2015) added a new long-term contracting requirement to the RPS program such that 65 percent of all procurement used for compliance with the RPS program be from contracts with terms of 10 or more years. The 65 percent long-term contracting requirement becomes effective for all retail sellers in the 2021-2024 compliance period, though some retail sellers elected early compliance in the 2017 – 2020 period. The vast majority of existing renewable energy procurement for IOUs and SMJUs is derived from long-term contracts. In comparison, CCAs and ESPs generally have not yet procured enough RPS energy from long-term contracts to meet the requirement. As demonstrated in 2019 draft procurement plans, a minority of LSEs are prudently procuring new renewables with sufficient lead-time to allow for potential delays in project development. Further, several CCAs have advocated for modification of the long-term contracting requirement to allow more time for new CCA entrants to comply, demonstrating the challenge that CCAs may have in meeting their imminent long-term RPS requirements. As explained in Chapter II, failure to meet the long-term requirement is connected to meeting overall RPS requirements. Thus, inadequate procurement planning may cause LSEs to not meet the State's requirements, resulting in negative implications for reliability of the power system, as well as in millions of dollars in penalties that could have a significant financial impact on an LSE's viability.

Recommendation: The CPUC will continue to enforce the long-term contracting statute intended to build new resources, ensure reliability, and avoid system shortfalls and the volatile pricing situation that occurred during the 2000 energy crisis. The CPUC encourages early long-term procurement to hedge for delays in project development for new renewable build and potential project performance issues. The IOUs' current and forecasted overcompliance with the 65 percent long-term contracting requirement is in large part a result of early contracting over several years.[126] The CPUC will continue to enforce SB 350 and SB 100 requirements with existing enforcement mechanisms to ensure compliance with the program. Near-term planning risks will be identified through the IRP and RPS proceedings to provide feedback to retail sellers for prudent planning of long-term RPS energy as is needed to satisfy their compliance requirements. Additionally, the CPUC has directed LSEs to provide a detailed plan for how they will meet the long-term contracting requirement and conduct risk assessments in their RPS Procurement Plans. Both narratives should consider the risk that an eligible renewable energy resource will not be built, or that construction will

[126] The CPUC will consider the IOUs' forecasted position as well as that of CCAs and ESPs as it considers the next steps in the Power Charge Indifference Adjustment (PCIA) proceeding, R. 17-06-026. The next phase, portfolio optimization planning, seeks to manage the IOUs' energy resource portfolio, including actions to lower procurement costs and reduce risk. Although the PCIA is intended to prevent IOU customers from stranded contract and procurement costs, the compliance benefits of the IOUs' long-term contracts will not migrate with departing load customers. Thus, it is imperative for CCAs and ESPs to prepare to meet the impending 65 percent long-term contracting requirement, while accounting for any unexpected risks such as project failure, contract termination, resource curtailment, generation shortfalls, among other project risk variables.

be delayed, with the result that electricity will not be delivered as required by the contract. Effective procurement planning should inform LSEs' procurement decisions, while minimizing compliance risks and project delays. The CPUC will continue to provide comprehensive instructions for LSEs' RPS Procurement Plans and require robust reporting on CCA and ESP progress in meeting the long-term contracting requirements. Additionally, the CPUC will continue to closely monitor LSEs' long-term contracting trends to ensure retail sellers are on track to meet the SB 350 long-term contracting requirements.

Challenge 4: Renewables Integration and Curtailment

Issue: California's success in renewable procurement has resulted in a surplus of solar generation during certain hours. This surplus can result in the need to curtail renewable energy that has already been contracted to serve customers. Economic curtailment is a market-based solution for reducing and/or eliminating the surplus electricity that is available on the grid.

As the State continues to increase its carbon-free generation requirements in the electricity sector, renewables integration is expected to increase instances of oversupply. This is expected to also be exacerbated by the increase of LSEs in California leading to the proliferation of separate procurement planning. Some CCA and ESP RPS Procurement Plans demonstrate a lack of any effort to analyze and address curtailment. The growing trend of renewable curtailment could pose a significant challenge for the State's transition toward fulfilling forthcoming renewable mandates. While the IOUs are addressing curtailment through contract terms, energy scheduling and bidding practices, and forecasting prices, many other LSEs' RPS Procurement Plans have failed to include an individualized forecast of future curtailment to assess potential impacts to ratepayers. As CCAs and ESPs increase their proportion of California customers they serve, it is necessary for them to better consider the risk of curtailment in meeting their RPS obligations.

Recommendation: The CPUC will continue to require LSEs to examine curtailment risk in their RPS Procurement Plans through modeling and forecasting of expected renewable curtailment in their renewable portfolios. IOUs can serve as a model for CCAs' and ESPs' curtailment and resource planning efforts. Also, CAISO has various market optimization mechanisms to address surplus electricity, including economic signals and real-time curtailments. LSEs' resource diversity and new project development can also address this challenge. For example, increased solar plus battery storage resources and distributed energy resources can reduce the need for economic curtailment. As demonstrated by the IRP's modeling scenarios testing the cost-effectiveness of economic renewable curtailment, economic curtailment of renewables continues to serve as an economically efficient option when planning for system reliability and obtaining the State's renewable energy and GHG reduction goals.[127] Additionally, curtailment frequency, cost and forecasting will continue to be required components in LSEs' annual RPS Procurement Plans[128] and used to inform options for addressing curtailment in the IRP and RPS proceedings.

[127] *See* 2017-18 Reference System Plan Decision (D.) 18-02-018.

[128] LSEs are required to report their experience and issues related to economic curtailment, as well as any actions and analysis needed to forecast curtailment events in their annual RPS Procurement Plans, pursuant to Public Utilities Code § 399.13(a)(5)(B) and § 399.15(b)(5).

Challenge 5: Jurisdictional Issues

Issue: The CPUC is charged with overseeing planning and compliance of the RPS program to ensure that the State meets renewable energy and climate goals while maintaining a safe, reliable electric system. To meet these goals, it is essential that the CPUC has program oversight for all LSEs, which includes the IOUs, CCAs, and ESPs. This oversight effort is particularly important as renewable procurement activities across the State become increasingly fractured. For instance, CCAs and ESPs now represent approximately 26 percent of the IOUs' former electric load, with additional load departure forecasted in the near future.

State law requires that CCAs and ESPs participate in the RPS program subject to the same terms and conditions applicable to the IOUs.[129] However, the analysis in Challenges 1 and 3 demonstrate a lack of compliance by a majority of LSEs. In formal CPUC filings, CCAs and ESPs universally challenge the CPUC's authority to require the submission of RPS data and assert that they provide RPS planning information only voluntarily.

As the State heads toward 60 percent RPS and 100 percent carbon-free energy goals in parallel with increasing responsibility for procurement in California shifting to CCAs and ESPs, it is essential that the CPUC receives the accurate, higher quality data it needs to oversee the RPS Program and report on the State's progress towards meeting the RPS requirements. Through its annual procurement planning process, the CPUC must be able to analyze all LSEs' progress in meeting RPS requirements as well as appropriately assess any risk and potential costs in meeting California's ambitious climate goals. The lack of such critical RPS planning information restricts the CPUC from informing the Legislature and public, impairs the CPUC's ability to make informed program and policy decision, and threatens the State's ability to meet climate goals while maintaining a reliable electric system.

Recommendation: To continue its oversight of the RPS program, the CPUC requires uniform, accurate planning and compliance data from all LSEs, including the CCAs and ESPs. In this regard, the RPS proceeding also coordinates closely with the CPUC's integrated resource planning (IRP) process. Further, the CPUC plans to continue to demonstrate its statutory mandate in communications with all LSEs, conveying the significant and pivotal role in oversight that it has for RPS procurement. However, given some CCAs' and ESPs' views that they provide information to the CPUC only on a voluntary basis, enforcement and penalties for deficient filings may be necessary.

[129] California Public Utilities Code § 399.12(j)(2).

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) acquired (1 REC = 1 megawatt hour (MWh)). Eligible renewable generation facilities may be located anywhere within the Western Electricity Coordinating Council (WECC) region.[130] These facilities are permitted to sell RECs to California retail sellers[131] of electricity to meet their RPS obligations, provided the facility meets all RPS eligibility criteria established by the 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.[132]

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 IOU contracts for RPS-eligible energy; and
- Determining and enforcing compliance with procurement targets.

Portfolio Content Category Rules

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 requirements are instrumental in determining a retail seller's compliance with the RPS program.

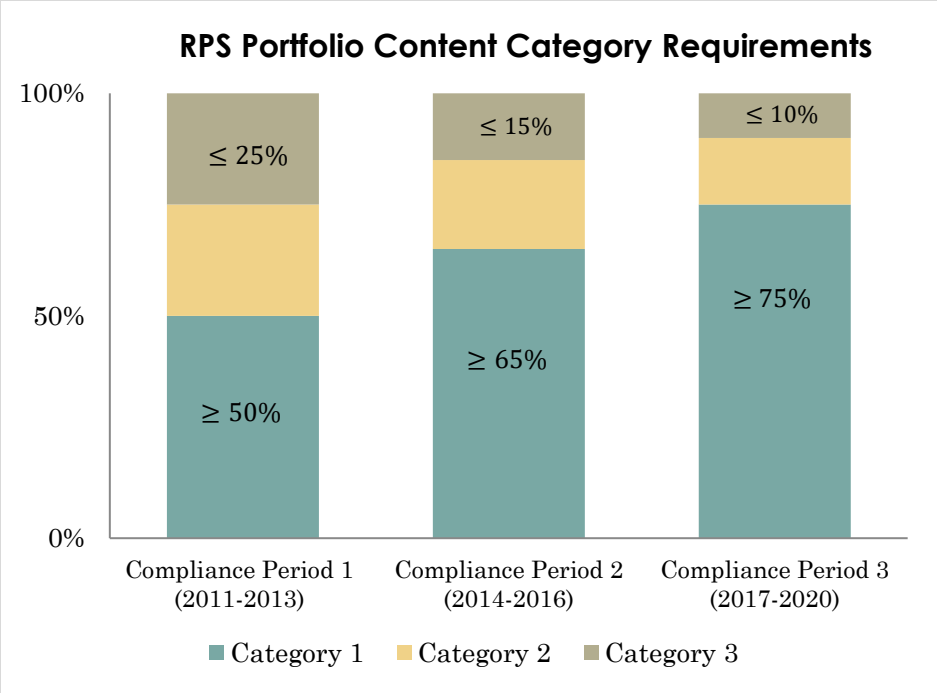
- **Category 1:** Bundled renewable energy credits (RECs) from facilities with a first point of interconnection within a California Balancing Authority (CBA), or facilities that schedule electricity into a CBA on an hourly or sub-hourly basis.
- **Category 2:** Procurement which bundles RECs with incremental electricity, and/or substitute energy, from outside a CBA. Generally, Category 2 RECs are generated from out-of-state renewable

[130] 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.
[131] 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.
[132] The CPUC Rulemaking for the RPS program is currently R.18-07-003.

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



In addition to complying with RPS procurement requirements and PCC classifications, 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 periods.[133] There is a maximum limit on the amount of Category 3 procurement that may be used in each compliance period, which decreases over the same timeframe.

[133] *See* Public Utilities Code § 399.16(c) for additional information.

RPS Excess Procurement Rules

RECs that are not used to fulfill RPS obligations in one 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.

The CPUC has implemented SB 350, which changes the banking rules. 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; no PCC 2 or PCC 3 RECs can be banked.

RPS Compliance Requirements

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

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 determine the compliance status of each retail seller in achieving the statewide mandate.

Retail sellers are required to submit annual preliminary 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.

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 retailers generated by the Western Renewable Energy Generation Information System (WREGIS) describing the amount of renewable electricity generated by every eligible facility.[134] The CEC analyzes 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 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 categories (PCCs) and is consistent with the portfolio balance requirement (PBR) and the procurement quantity requirement (PQR).

[134] 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: 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, 2018, there are 20 registered CCAs in California.

(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.

(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.[135]

(LSE) Load Serving Entity: All entities that serve electricity to customers including IOUs, SMJUs, CCAs, and ESPs.[136]

(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.

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[135] 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.

[136] The CPUC is responsible for compliance and enforcement activities for retail sellers, which excludes Publicly-Owned Utilities.

(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 multijurisdictional subject to different rules per PUC § 399.17 and § 399.18.

APPENDIX C: CALIFORNIA'S ACTIVE LOAD SERVING ENTITITES

Investor- Owned Utilities (IOUs)	Small and Multi-Jurisdictional Utilities (SMJUs)	Community Choice Aggregators (CCAs)	Electric Service Providers (ESPs)
• Pacific Gas and Electric Company (PG&E)	• Bear Valley Electric Service (BVES)	•Apple Valley Choice Energy (AVCE)	• 3 Phases Renewables
• Southern California Edison (SCE)	• Liberty Utilities (formerly CalPeco Electric)	•Clean Power Alliance (CPA)	• Agera Energy
• San Diego Gas & Electric (SDG&E)	• PacifiCorp	•CleanPowerSF (CPSF)	• American PowerNet
		•East Bay Community Energy (EBCE)	• Calpine Energy Solutions (CES)
		•King City Community Power (KCCP)	• Calpine Power America
		•Lancaster Choice Energy (LCE)	• Commercial Energy of CA
		•Marin Clean Energy (MCE)	• Constellation New Energy
		•Monterey Bay Community Power (MBCE)	• Direct Energy Business
		•Peninsula Clean Energy (PCE)	• EDF Industrial Power Services
		•Pico Rivera Innovative Municipal Energy (PRIME)	• Just Energy Solutions
		•Pioneer Community Energy (Pioneer)	• Pilot Power Group
		•Rancho Mirage Energy Authority (RMEA)	• Shell Energy North America (SENA)
		•Redwood Coast Energy Authority (RCEA)	• Tiger Natural Gas
		•San Jacinto Power (SJP)	• UC Regents
		•San Jose Clean Energy (SJCE)	
		•Silicon Valley Clean Energy (SVCE)	
		•Solana Energy Alliance (SEA)	
		•Sonoma Clean Power (SCP)	
		•Valley Clean Energy Alliance (VCEA)	

APPENDIX D: 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.