2018

California Renewables Portfolio Standard

Annual Report

November 2018

ABOUT THIS REPORT

The purpose of this annual report is to comply with Public Utilities Code Section 913.4. 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.

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EXECUTIVE SUMMARY

In compliance with Senate Bill (SB) 1222 (Hertzberg, 2016; as codified in Public Utilities Code § 913.4[1]), the California Public Utilities Commission (CPUC or Commission) 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 in complying with the RPS program and shows that:

California's Electricity Retail Sellers are Meeting the RPS Requirements

- Most of the retail sellers procured at or above the 27% RPS annual target for 2017.[2]
- The large investor-owned utilities (IOUs) have executed renewable electricity contracts necessary to meet the 33% RPS requirement by 2020 and forecast reaching 50% by 2020.
- The Small and Multi-Jurisdictional Utilities (SMJUs), Community Choice Aggregators (CCAs), and Electric Service Providers (ESPs) report compliance with current RPS requirements and forecast that they will meet the future RPS requirement in 2020 with additional procurement.

Increased Renewable Procurement by CCAs and ESPs Must Occur in the Near Term

- Based on the CCAs' Renewable Net Short[3] calculations, the CCAs will have an immediate RPS procurement need of approximately 6,900 GWh beginning in 2020.
    - Current load forecasts indicate the overall CCA need to meet RPS requirements is approximately 16,800 GWh in 2020.
- The ten CCAs who began service in 2018 will have the largest procurement need in the near term.
- New and existing ESPs will also have a significant procurement need to meet the 2020 33% RPS requirement.

Solar and Wind Resources Dominate RPS Portfolios

- In 2017, an average of 74% of IOU, SMJU, and CCA renewable portfolios were solar and wind resources. Biopower, geothermal and small hydroelectric each also contribute an average of 8%.

RPS Contract Prices for IOUs Continue to Fall

- RPS contract prices dropped an average of 9.5% per year between 2007 and 2015.
- In 2016, average contract prices spiked due to mandated high fire hazard zone biomass procurement.
- In 2017, the trend of falling contract costs resumed and reached a historic low price of $47/MWh for average annual RPS eligible energy contracts for all technology types.

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[1] See Appendix C for full text of Public Utilities Code (PU Code) Section 913.4.
[2] Based on preliminary 2018 Annual Compliance Report filings submitted to the CPUC, retail sellers are forecasted to meet the RPS requirements.
[3] Renewable Net Short (RNS) is defined as the amount of new renewable generation necessary to meet or exceed RPS requirements. The calculations are submitted to the CPUC in the Annual RPS Procurement Plans.

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% 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% mandate be met by 2010. In April 2011, Governor Brown signed SB 2 (1X) (Simitian), which codified a 33% RPS requirement to be achieved by 2020. In 2015, Governor Brown signed into law SB 350 (de León, 2015), which mandated a 50% RPS by December 31, 2030. SB 350 includes interim annual RPS targets with three-year compliance periods. In addition, SB 350 requires that 65% of RPS procurement must be derived from long-term contracts of 10 or more years. In 2018, Governor Brown signed into law SB 100 (de León, 2018), which again increases the RPS to 60% by 2030 and requires all the state's electricity to come from carbon-free resources by 2045. While SB 100 does not take effect until January 1, 2019, this report assumes the new mandates are in effect.

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 large investor-owned utilities (IOUs), small and multi-jurisdictional utilities (SMJUs), community choice aggregators (CCAs), electric service providers (ESPs), and publicly-owned utilities (POUs) to procure 60 percent of their total electricity retail sales from renewable energy resources by 2030.[4] 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.[5] 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. Entities under the CPUC's jurisdiction serve approximately 75% of the total electricity demand in California. The Publicly Owned Utilities (POUs) serve the remaining 25%.[6] Within the CPUC's jurisdiction, the large IOUs served approximately 70% of the total electricity load in 2017, while the SMJUs, CCAs, and ESPs served the remaining 30%.[7]

[4] Senate Bill (SB) 100 (de León, 2018) amends the RPS program to require all LSEs to meet a 60% RPS mandate by 2030. This legislation becomes effective January 1, 2019.
[5] See Appendix A: How the RPS Program Works for additional information about the RPS program.
[6] POUs report their RPS compliance to the California Energy Commission and their information is not included in this report.
[7] Load estimates are taken from the CEC's Integrated Energy Policy Report: https://www.energy.ca.gov/2017_energypolicy/

II. RPS PROGRESS AND STATUS

This chapter uses historical annual data through December 31, 2017 from RPS Compliance Reports and the RPS Procurement Plans from the large IOUs, SMJUs, CCAs, and ESPs to illustrate the state of the RPS program.

Current Renewable Portfolios

All electricity retail sellers had an interim target between compliance periods to serve at least 27% of their load with RPS-eligible resources by December 31, 2017. In general, retail sellers either met or exceeded the interim 27% target and are on track to achieve their compliance requirements.

Large Investor-Owned Utilities

The large investor-owned utilities (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.[8] The three large IOUs are well positioned to meet their procurement requirements for the 60% RPS mandate.

Table 1: Actual 2017 IOU RPS Procurement Percentages

PG&E	33%
SCE	32%
SDG&E	44%

Data Source: IOU Annual RPS Compliance Reports, August 2018

The IOUs have already surpassed the 2017 annual RPS percentage target of 27%, as illustrated in Table 1.[9] The three large IOUs are forecasted to continue to 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)[10] associated with the excess procurement to other load-serving entities, such as CCAs or ESPs.

A variety of market conditions have caused the IOUs to have procured beyond their minimum RPS requirements. These market conditions include the initial need to hedge against early program experience with project failure, the current climate of increasing departing load to CCAs, and the increase in behind-the-meter solar generation.[11]

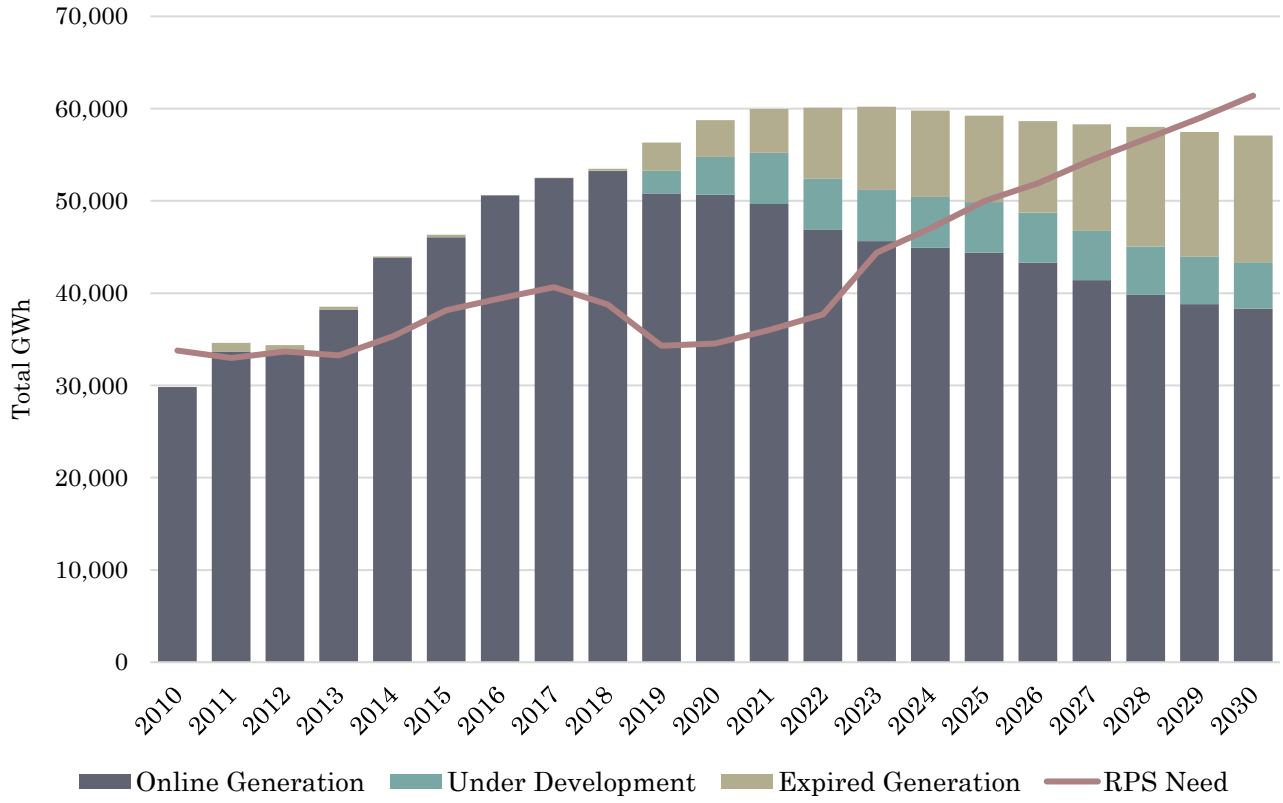
[8] For more information on California electric utility service areas, see the CEC's California Energy Maps website: https://www.energy.ca.gov/maps/serviceareas/electric_service_areas.html

[9] Based on their annual Draft 2018 RPS Procurement Plans, as well as Compliance Reports filed with the CPUC in 2018.

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

[11] The IOUs' excess procurement is based on the current forecast of bundled electricity load and the amount of RPS resources already under contract. Additional CCA load departures will result in increased amounts of excess RPS resources in the future.

Figure 1: Aggregated IOU Progress Towards 60% RPS (2010-2030)



Data Source: IOUs' 2018 Draft RPS Procurement Plans Renewable Net Short calculations, October 2018

Figure 1 uses the most current annual data to illustrate the actual and forecasted progress the IOUs have made toward meeting the 60% RPS mandate, on a risk-adjusted basis.[12] The graph shows a forecasted surplus of renewable generation through 2024 and physical deficit beginning in 2026.

The IOUs forecast that they can meet their RPS requirements by using a combination of online generation and banked RECs and will exceed the 33% RPS requirement by 2020. Given that the IOUs have significant excess eligible RPS procurement to apply in later years, they did not conduct annual RPS solicitations in 2016 or 2017, nor do they plan to undertake solicitations in 2018.[13]

[12] Generation forecasts from projects "Under Development" are risk-adjusted to account for a certain degree of project failure. Failure rate assumptions are provided by the IOUs in their renewable net short calculation provided with their Draft Annual RPS Procurement Plans. The "Expired Generation" data represents the amount of generation associated with facilities that no longer have a 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.

[13] The CPUC must approve solicitations outlined in an IOU's annual RPS Procurement Plan. None of the IOUs have proposed to conduct solicitations to procure renewable energy in 2019 beyond mandated procurement programs (e.g. BioMAT).

Table 2: Average Actual and Forecasted IOU RPS Percentages for PG&E, SCE, and SDG&E											
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%	46%	50%	53%	51%	51%	51%

Data Source: IOU RPS Compliance Reports, August 2018 [14]

Table 2 includes a simple average of the IOUs' actual RPS procurement and forecasted procurement percentages and shows that the IOUs forecast that they will exceed their 2020 RPS compliance period requirements and be procuring 50% RPS by 2020. The data is averaged to provide a statewide view of progress and anticipated compliance.[15]

[14] Forecasted data from 2018 through 2021 for each individual IOU is treated as confidential information per D.06-06-066.

[15] 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

Small and Multi-Jurisdictional Utilities

The small and multi-jurisdictional utilities[16] (SMJUs) serving electric load in California are Bear Valley Electric Service (BVES), Liberty Utilities (formerly CalPeco Electric), and PacifiCorp. BVES provides electricity service to the Big Bear Valley in the San Bernardino Mountains and Liberty Utilities serves the counties located in the Lake Tahoe Basin. PacifiCorp is a multi-jurisdictional utility that provides service to four Northern California counties: Del Norte, Modoc, Siskiyou, and Shasta.

The three SMJUs included their forecasted RPS procurement percentages in their 2018 RPS Procurement Plan and Compliance Report filings. Table 3 shows a simple average of the three SMJUs' RPS percentages.[17]

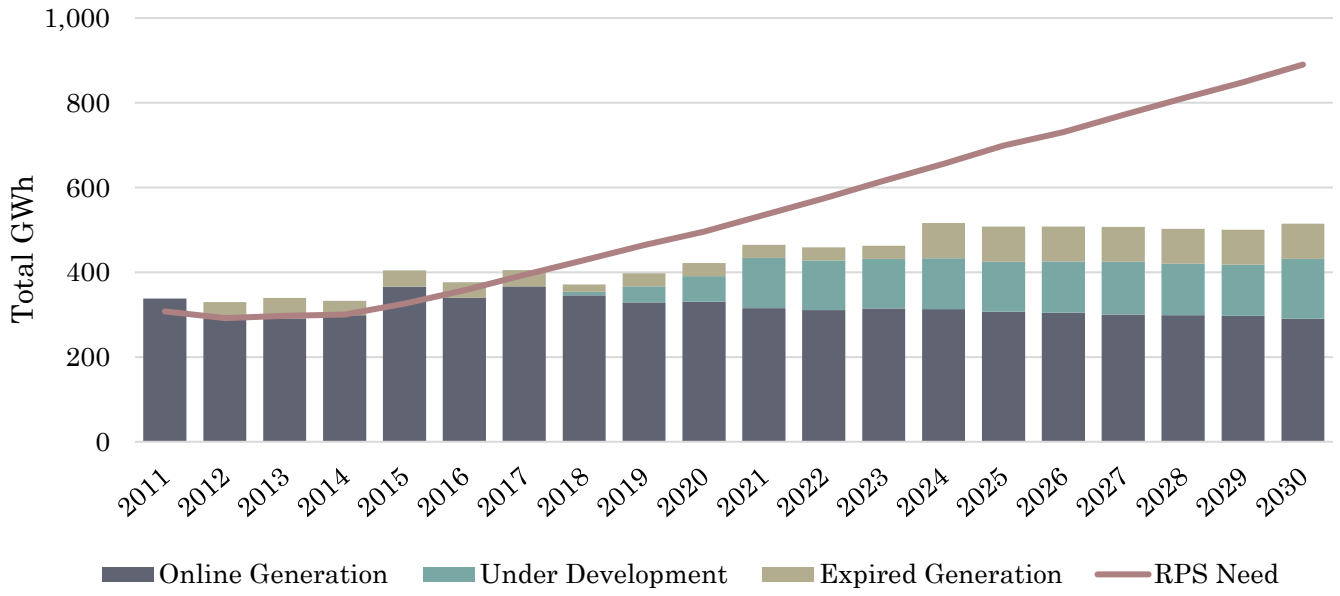
Table 3: Average Actual and Forecasted SMJU RPS Percentages for BVES, Liberty, and PacifiCorp

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%	26%	26%	26%	27%	28%	16%

Data Source: SMJU RPS Compliance Reports, August 2018

As seen in Figure 2, the aggregate SMJU data indicates that the SMJUs will collectively need to procure additional resources to meet the Compliance Period 3 requirements.

Figure 2: Aggregated SMJU Progress Towards 60% RPS (2011-2030)



Data Source: SMJUs' 2018 RPS Procurement Plans Renewable Net Short calculations, October 2018

[16] SMJUs are also investor-owned utilities but are considered small and multijurisdictional and have different rules per PUC § 399.17.

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

Community Choice Aggregators

RPS Compliance Reports submitted by the community choice aggregators (CCAs)[18] that operated in 2017 indicate that they have procured at or above the annual RPS targets to date. However, their annual compliance reports indicate most CCAs will need to procure additional renewable resources to meet the 60% RPS target by 2030.[19] Table 4 provides a statewide average of the CCAs' reported procurement percentages.

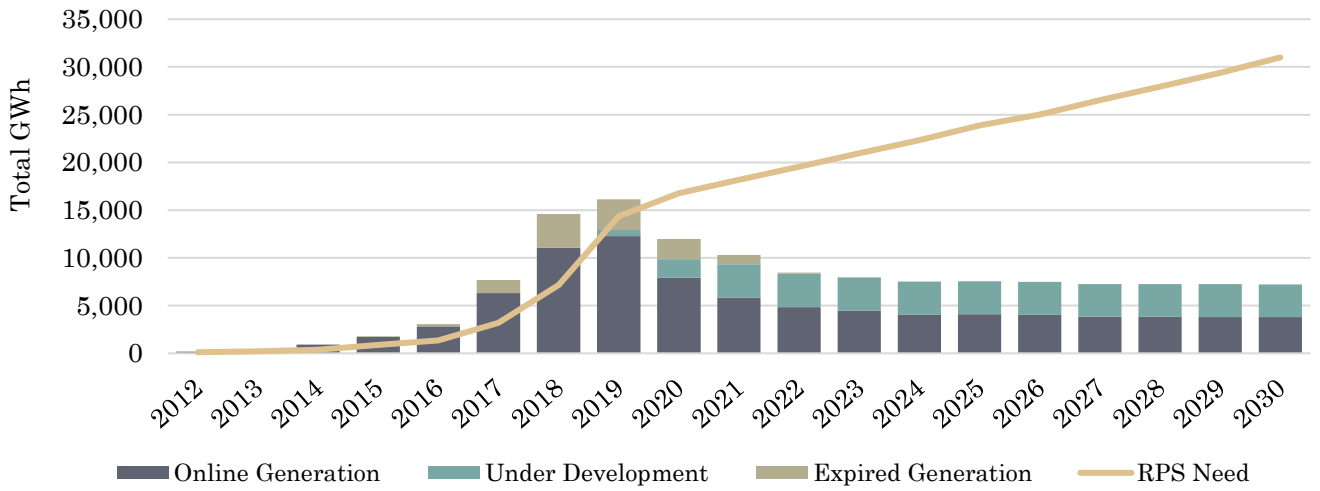
Table 4: Average Actual and Forecasted CCA RPS Percentages

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%	47%	35%	27%	24%	18%	16%	15%

Data Source: CCA RPS Compliance Reports, August 2018

The data in Table 4 considers the CCAs as they have reached operational status. In 2014, only Marin Clean Energy and Sonoma Clean Power were serving load, 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[20] have launched in localities throughout the state in 2018 but their data is not included in Table 4 since they were not operating in 2017.[21]

Figure 3: Aggregated CCA Progress Towards 60% RPS (2012-2030)



Data Source: CCAs 2018 RPS Procurement Plans Renewable Net Short calculations, October 2018

[18] CCAs in operation from 2011 – 2017 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).
[19] See Table 5 for a breakdown of RPS position by each individual operating CCA.
[20] The CCAs who launched in 2018 include: 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.
[21] The aggregated view is presented to avoid confidentiality issues with forecasted percentages and is not representative of individual CCAs.

Figure 3 uses the most current annual data to illustrate the actual and forecasted progress the CCAs have made toward meeting the 60% RPS mandate. Eighteen of the twenty certified CCAs have executed renewable energy contracts to serve their forecasted load. However, as the RPS requirements increase and more CCAs fully come online, there will be a near-term renewable procurement need.

In 2017, nine CCAs serving a total of 11,800 GWh of load had an average RPS position of 49%. Table 5 below shows that the forecasted 2018 RPS positions of all CCAs in operation vary between a position of 0% and 64%. It is anticipated that the drastic year-to-year fluctuations in RPS positions illustrated in Table 5 will decrease significantly by 2021 as a result of the SB 350 requirement that 65% of RPS resources be contracted for ten or more years.[22]

Table 5: Annual RPS Position of CCAs (%)

First Year Serving Load	CCA	Actuals	Forecasted		
		2017	2018	2019	2020
2010	Marin Clean Energy	60%	64%	72%	76%
2014	Sonoma Clean Power	45%	47%	48%	47%
2015	Lancaster Choice	37%	36%	36%	36%
2016	Peninsula Clean Energy	54%	37%	34%	42%
2016	CleanPowerSF [23]	46%	-	-	-
2017	Apple Valley Choice	38%	37%	37%	37%
2017	Pico Rivera	64%	53%	53%	53%
2017	Redwood Coast Energy Authority	45%	47%	19%	16%
2017	Silicon Valley Clean Energy	55%	54%	54%	54%
2018	Valley Clean Energy Alliance	N/A	43%	1%	0%
2018	Monterey Bay Community Power	N/A	30%	31%	33%
2018	San Jacinto Power	N/A	37%	37%	37%
2018	Rancho Mirage Energy Authority	N/A	36%	36%	36%
2018	Clean Power Alliance	N/A	52%	12%	2%
2018	East Bay Community Energy	N/A	28%	24%	0%
2018	Pioneer Community Energy	N/A	29%	31%	33%
2018	Solana Energy Alliance	N/A	48%	0%	0%
2018	San José Community Energy	N/A	41%	42%	44%
2018	King City Community Power	N/A	0%	0%	0%

Data Source: CCA RPS Procurement Plans, August 2018

[22] Senate Bill (SB) 350 (de León, 2015) requires that 65% of total RPS procurement comes from long term contracts (≥ 10 years) beginning in 2021.
[23] CleanPowerSF has claimed confidentiality of its forecasted RPS position per CPUC D.06-06-066.

Electric Service Providers

ESPs are non-utility electricity service providers and currently serve approximately 13% of electricity load within the CPUC's jurisdiction. 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. Senate Bill (SB) 237 (Hertzberg, 2018) requires an increase in the maximum allowable electric load cap for ESPs by 4,000 GWh. The load cap for ESPs in California is about 25,000 GWh and has been met by existing ESPs.[24]

Table 6: Average Actual and Forecasted ESP 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%	13%	11%	8%	7%	7%	7%

Data Source: ESP RPS Compliance Reports, August 2018

Table 6 provides an average of the ESPs' reported procurement percentages. Most ESPs do not forecast their RPS position beyond a few years in the future. One reason why ESP procurement percentages are much lower in later years is that a majority of RPS procurement is done with short-term contracts. Table 7 provides a list of ESPs that served load in 2017.

Table 7: ESPs[25] Serving California Load in 2017

First Year Serving CA Load	ESP
2011	3 Phases Renewables
2016	Agera Energy
2017	American Power Net
2011	Calpine Energy Solutions
2011	Calpine Power America
2011	Commercial Energy
2011	Constellation New Energy
2011	Direct Energy Business
2013	EDF Industrial Services
2011	Just Energy Solutions
2011	Pilot Power Group
2011	Shell Energy North America
2011	Tiger Natural Gas
2015	UC Regents

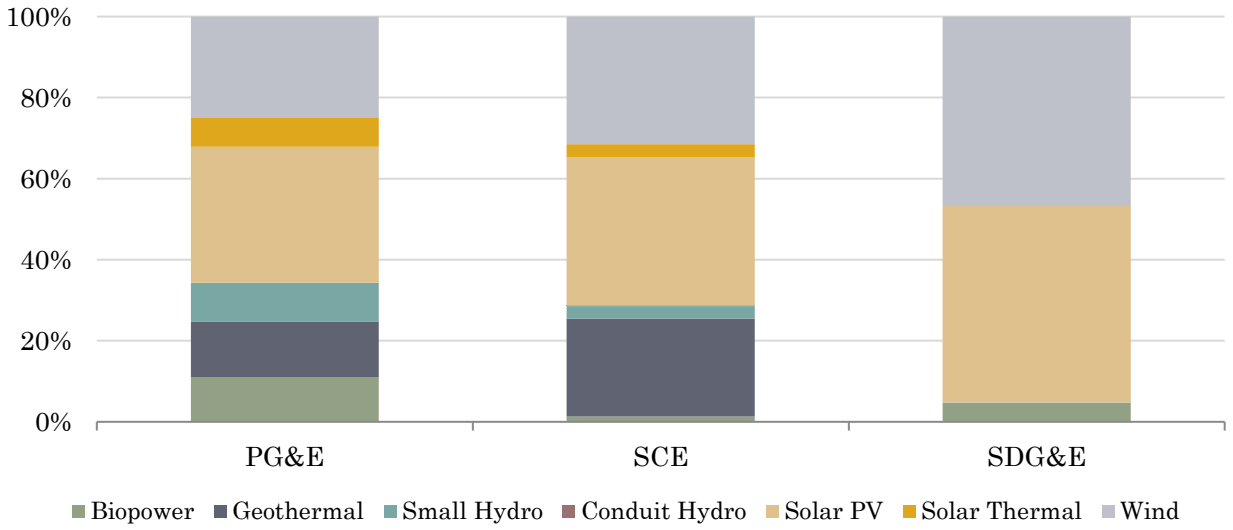
[24] See D.10-03-022, "*Decision Regarding Increased Limits for Direct Access Transactions*", for more information.
[25] Table 7 only includes ESPs that were serving load in Compliance Period 3 (2017-2020). There are 21 registered ESPs but only 14 served load in 2017.

Renewable Technology Mix

Large Investor-Owned Utilities

Since the inception of the RPS program in 2002, the IOUs have continuously added renewables to their portfolios to satisfy their RPS procurement requirements. The IOUs contract with a wide range of renewable technologies, as seen below in Figure 4. As of December 2017, the IOUs have procured diverse renewable energy resources such as wind, solar thermal, solar photovoltaic (PV), geothermal, biopower, and small hydroelectric facilities to meet the requirements of the RPS program.[26]

Figure 4: IOU Renewable Portfolio Mixes in 2017



Data Source: IOU Annual RPS Compliance Reports, August 2018

In 2017, the majority of the IOU's portfolios were comprised of solar and wind technologies:

Table 8: Portfolio Percentages for IOU 2017 RPS Mix

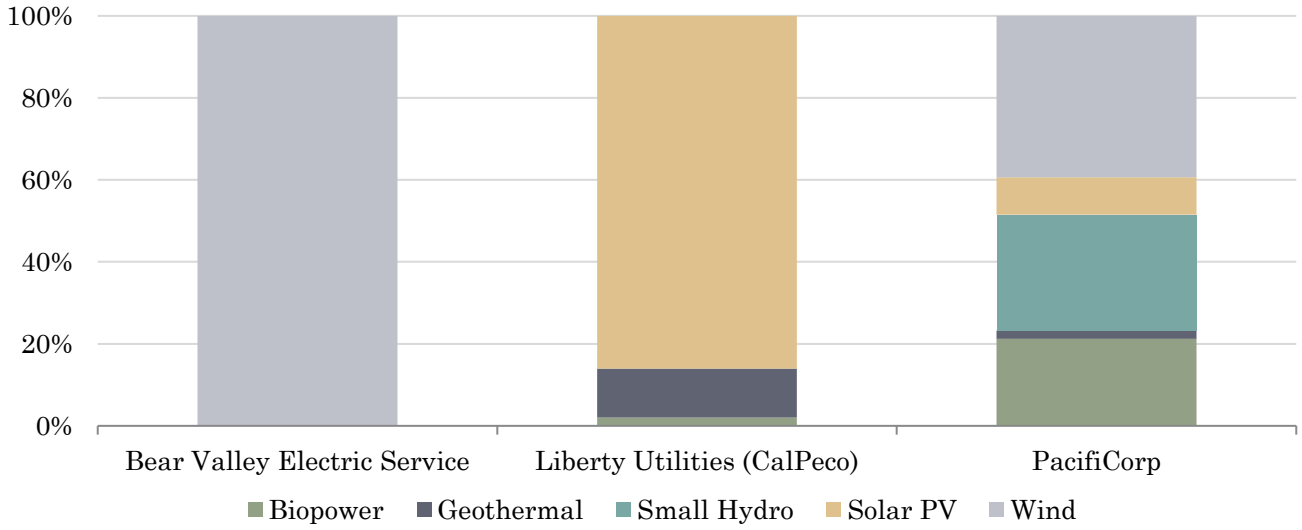
	Biopower	Geothermal	Small Hydro[27]	Conduit Hydro[28]	Solar PV	Solar Thermal	Wind
PG&E	11%	14%	10%	0%	34%	7%	25%
SCE	1%	24%	3%	0.1%	37%	3%	31%
SDG&E	5%	0%	0%	0%	49%	0%	47%

[26] Approximately 0.1% 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.
[27] Small Hydro projects are defined as hydroelectric facilities that are under 30 MW in capacity by the CEC's RPS Eligibility Guidebook.
[28] Conduit Hydro facilities use the hydroelectric potential of an existing man-made conduit that is operated to distribute water and should have a nameplate capacity of 30 MW or less to be considered RPS-eligible.

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 5 shows, Bear Valley Electric Service only procured RECs from wind resources in 2017.[29] Liberty Utilities procured primarily from solar PV and geothermal facilities. In 2017, PacifiCorp had the most diverse mix with six different technologies[30] in its California renewable energy portfolio[31], with the majority comprised of wind and small hydroelectric facilities.

Figure 5: SMJU Renewable Portfolio Mixes in 2017



Data Source: SMJU Annual RPS Compliance Reports, August 2018

In 2017, the majority of the SMJU's portfolios were comprised of solar and wind technologies:

Table 9: Portfolio Percentages for SMJU 2017 RPS Mix

	Biopower	Geothermal	Small Hydro	Conduit Hydro	Solar PV	Wind
BVES	-	-	-	-	-	100%
Liberty Utilities	2%	12%	-	-	86%	-
PacifiCorp	21%	2%	28%	0.3%	9%	39%

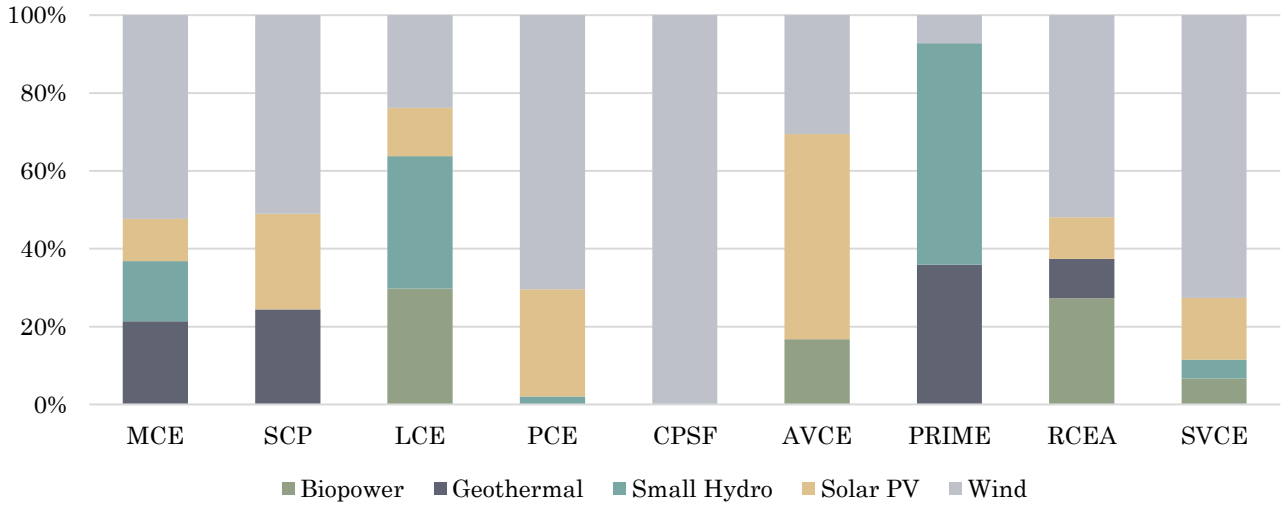
[29] Per Public Utilities Code 399.17 and CPUC Decisions (D.)11-12-052 and (D).12-06-038, SMJUs can use RPS-eligible procurement for RPS compliance without regard to the portfolio balance requirements.
[30] Approximately 0.3% of PacifiCorp's renewable portfolio is comprised of Conduit Hydroelectric technology.
[31] 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.

Community Choice Aggregators

Figure 6 illustrates the renewable energy portfolio mixes of the nine CCAs that operated in California in 2017. Of the CCAs operating in 2016, Marin Clean Energy (MCE), Sonoma Clean Power (SCP), and Lancaster Choice Energy (LCE) have more diverse resource mixes than Peninsula Clean Energy (PCE) and CleanPowerSF (CPSF). Both PCE and CPSF's first year of service was 2016.

In 2017, wind energy resources made up most of the renewable portfolios of MCE, SCP, PCE, CPSF, Redwood Coast Energy Authority (RCEA), and Silicon Valley Clean Energy (SVCE). Of the new CCAs that began service in 2017, RCEA has the most diverse portfolio with a mix of biopower, geothermal, solar PV, and wind. Pico Rivera Innovative Municipal Energy (PRIME) mainly procured small hydro and geothermal and Apple Valley Choice Energy (AVCE) primarily procured solar and wind.

Figure 6: CCA Renewable Portfolio Mixes in 2017



Data Source: CCA Annual RPS Compliance Reports, August 2018

In 2017, the majority of the CCA's portfolios were comprised of wind resources:

Table 10: Portfolio Percentages for CCA 2017 RPS Mix

	Biopower	Geothermal	Small Hydro	Solar PV	Wind
MCE	0%	21%	15%	11%	52%
SCP	0%	24%	0%	25%	51%
LCE	30%	0%	34%	12%	24%
PCE	0%	0%	2%	28%	70%
CPSF	0%	0%	0%	0.04%	99.96%
AVCE	17%	0%	0%	53%	31%
PRIME	0%	36%	57%	0%	7%
RCEA	27%	10%	0%	11%	52%
SVCE	7%	0%	5%	16%	73%

Renewable Project Development

Large Investor-Owned Utilities

In 2017, the IOUs collectively executed nine ReMAT contracts, five BioMAT contracts, four Qualifying Facilities (QF) contracts, and six RFO/Solicitation contracts for a total of 446 MW of newly contracted RPS capacity.[32]

Table 11: Number of Large IOU RPS Contracts Approved by the CPUC in 2017

	PG&E		SCE		SDG&E		Totals	
Procurement Program	Contracts	MW	Contracts	MW	Contracts	MW	**Contracts**	**MW**
ReMAT	6	6	3	7.5	0	0	**9**	**13.5**
BioMAT	4	4	0	0	1	3	**5**	**8**
RFO/Solicitation	3	60	2	253	1	105	**6**	**418**
QF Contract	2	6	2	0.5	0	0	**4**	**6.5**
REC Sales	5	-	0	-	0	-	**5**	**-**
Totals	17	16	7	261	2	108	**29**	**446**

Data Source: CPUC RPS Database, October 2018

Small and Multi-Jurisdictional Utilities

Bear Valley Electric Service and Liberty Utilities did not do any additional procurement for RPS resources in 2017. Liberty did have a 50 MW solar project begin operation in 2017 and received Commission approval of a 10 MW solar project, which is expected to commence operations on January 1, 2019. PacifiCorp issued a request for proposal (RFP) in March 2017 for RPS resources to meet its California compliance requirements. In 2017, PacifiCorp executed four contracts with wind facilities under development that will begin deliveries in 2021. The majority of PacifiCorp's owned renewable resources are eligible and certified for California's RPS program and used for its RPS compliance.

[32] 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 11 illustrates data from the large IOUs, but there were also other RPS contracts signed by the SMJUs, CCAs, and ESPs.

Community Choice Aggregators

Several CCAs have executed long-term contracts with new utility-scale renewable projects, including CleanPowerSF (CPSF), Marin Clean Energy (MCE), Monterey Bay Community Power (MBCP), Peninsula Clean Energy (PCE), Sonoma Clean Power (SCP), and Silicon Valley Clean Energy (SVCE).

CPSF, MCE, MBCP, PCE, SCP, and SVCE have a total of twelve new facilities under contract, with commercial operation dates between 2018 and 2021.

Table 12: New Renewables Projects with CCA Contracts

CCA	Technology	Capacity (MW)	Location	Contract Term (Years)	COD[33]
CPSF	Solar PV	100	Los Angeles County, CA	22	2019
CPSF	Wind	47	Kern County, CA	15	2020
MCE	Wind	42	Kern County, CA	12	2018
MCE	Solar PV	105	Los Angeles County, CA	20	2019
MCE	Solar PV	160	Fresno County, CA	20	2021
MCE	Wind	125	Merced County, CA	12	2021
MCE	Solar PV	80	Riverside County, CA	20	2021
MBCP	Wind	90	Torrance County, NM	15	2021
PCE	Solar PV	100	Kings County, CA	15	2019
PCE	Solar PV	200	Merced County, CA	25	2019
SCP[34]	Wind	80	Alameda County, CA	20	2020
SVCE	Wind	110	Torrance County, NM	15	2021
Total		**1,239**			

Data Source: CCA RPS Procurement Plans, August 2018

The following CCAs only entered into contracts with RPS facilities that are already in commercial operation: Apple Valley Choice, Clean Power Alliance, East Bay Community Energy, Lancaster Choice, Pico Rivera, Pioneer Community Energy, Rancho Mirage, Redwood Coast Energy, San Jacinto, San Jose, Solana Energy Alliance, and Valley Clean Energy. King City Community Power began service in July 2018 and had not procured any RPS resources before the publication of this report, as shown in Table 5.

Electric Service Providers

Electricity Service Providers (ESPs) serve commercial and industrial customers in the Direct Access (DA) program. All ESPs exclusively contract with existing facilities that have achieved commercial operation. The contracts executed by ESPs are generally for short-term procurement, ranging from one to three-year terms.

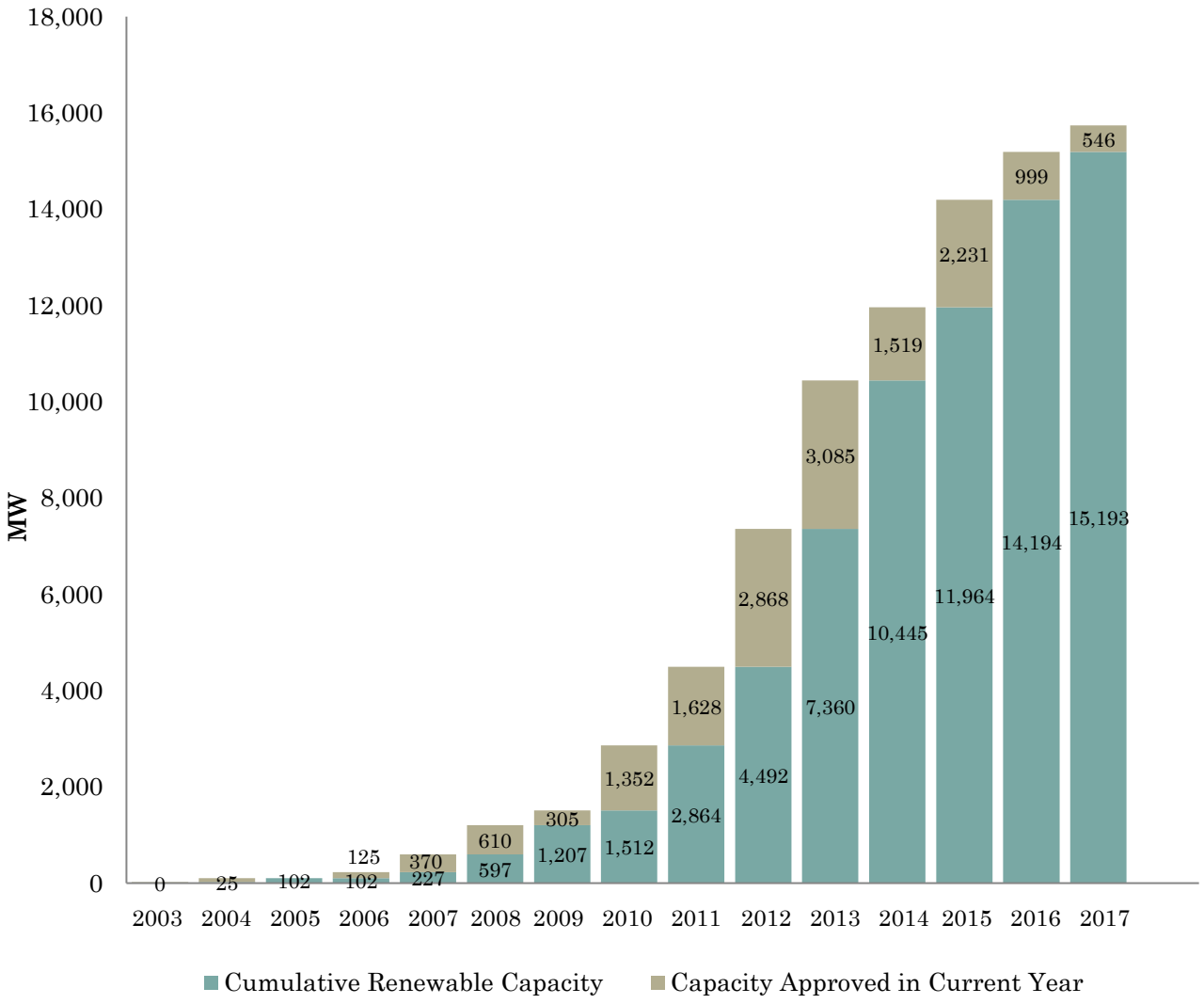
[33] Commercial operation date (COD) is defined as the date which a project has achieved or is expected to achieve full commercial operation.

[34] SCP is contracted with the Sand Hill Wind facility in Alameda County. Sand Hill Wind is an existing facility but is undergoing a repowering project whereby older turbines are being replaced with new ones and is therefore considered a project under development.

Contracted Renewable Capacity

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 data on how much capacity has been approved for the large IOUs since the start of the RPS program. Since 2003, the three large IOUs have contracted for 15,739 MW of renewable capacity[35] under the RPS program. The approved RPS capacity shown in Figure 7 includes both in-state and out-of-state facilities, with most of the facilities being located in-state.

Figure 7: CPUC Approved RPS Capacity from 2003 to 2017



Data Source: CPUC RPS Database, October 2018

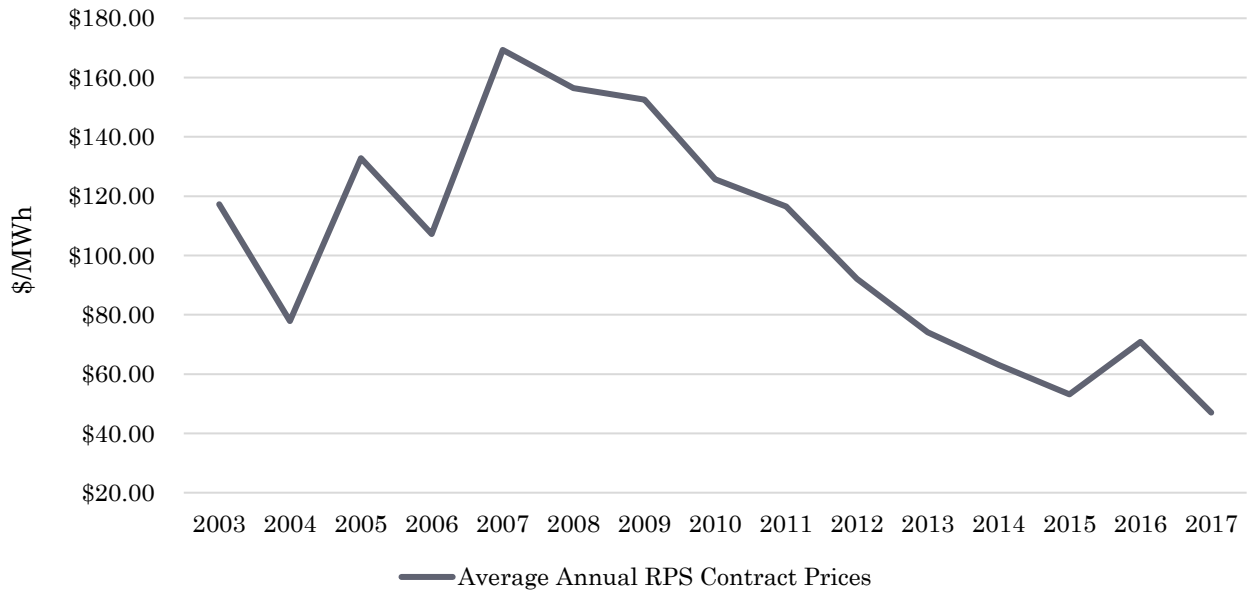
[35] Renewable capacity is defined as the maximum power generating capacity of power plants that use renewable energy sources to produce electricity.

RPS Procurement Costs

To understand the impact that RPS procurement costs will have on ratepayers, the CPUC sets cost-effectiveness policies and collects various pricing data to evaluate cost trends. The IOUs are required to use competitive procurement mechanisms and a Least-Cost/Best-Fit evaluation methodology[36] 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 proceeding to identify the most cost-effective resources to inform future procurement activities.

The overall contracted commitment in renewables by retail sellers in California has increased over time, which has contributed to the cost competitiveness of technologies such as solar and wind. Figure 8 illustrates the average annual contract prices for procuring RPS eligible projects with capacities greater than 3 MW in real dollars (Consumer Price Index adjusted) per megawatt hour ($/MWh) for the three IOUs.

Figure 8: Average Annual RPS Contract Prices
(2018 Real Dollars - CPI Adjusted)



Data Source: 2018 Annual Report on Costs and Cost Savings for the RPS Program (Padilla Report)[37]

The overall downward trend in contract prices can be attributed to falling prices for wind and solar technologies, which together make up 81% of the total renewable generating capacity in California.[38] In 2016, average annual contract prices spiked due to mandated bioenergy procurement from high hazard zones (HHZs) stemming from Governor Brown's October 30, 2015, Emergency Proclamation and SB 859 (2016). In 2017, the trend of falling contract costs continued and reached a historic low price of $47/MWh for average annual RPS- eligible energy contracts.

[36] 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.
[37] Values were inflation adjusted using the U.S. Bureau of Labor Statistics' Consumer Price Index.
[38] For more information on California's statewide renewables breakdown see http://www.caiso.com/informed/Pages/CleanGrid/default.aspx

III. 2018 RPS PROGRAM ACTIVITIES

This section identifies and discusses RPS activities of note, including IOU renewable energy credit (REC) solicitations, implementation of legislation, and compliance and enforcement actions through June 2018.

RPS Procurement Activities

As described in section II of this report, the IOUs currently have contracts for procurement beyond the RPS requirements and are positioned to meet a 50% RPS by 2020. Consequently, the IOUs chose not to hold annual RPS solicitations to procure new RPS energy in 2018. However, the IOUs were required to procure renewable energy through other programs to meet the RPS and various other state policy goals. These programs include Renewable Auction Mechanism (RAM) and Bioenergy Market Adjusting Tariff (BioMAT). Only the IOUs were required to procure RPS resources through these mandated programs.

Due to the IOU's excess RPS procurement, CPUC Decision (D).17-12-007 authorized the IOUs to hold REC sales solicitations in 2018. Pacific Gas and Electric and San Diego Gas & Electric held REC sales solicitations in the first half of 2018 to sell RPS energy in their portfolios and Southern California Edison launched a REC sales solicitation in October 2018.

Renewable Auction Mechanism

The Renewable Auction Mechanism (RAM) is a simplified, market-based mechanism for renewable distributed generation projects. In the RAM program, the IOUs competitively procure RPS-eligible generation via a streamlined procurement process. The program allows bidders to set their own price and use a standard contract. After a project has been chosen, the IOUs submit the project to the CPUC for approval through an expedited regulatory review process. Since the inception of the RAM program, the IOUs have held several auctions, and procured a total of 1,604 MW.

Each of the IOUs approached RAM in various ways in 2018. SCE did not hold any RAM solicitations given that it met its RAM obligations in 2016. SDG&E met its RAM obligation by executing a RAM 7 (i.e., SDG&E's seventh RAM solicitation) contract at the end of 2017. PG&E launched its RAM 8 solicitation in December 2017 and executed three contracts in mid-2018.

Table 13: RAM Mandated Allocations by Large IOU (MW)[39]

	PG&E	SCE	SDG&E	Total
Total RAM Procurement Requirement	653	756	165	**1,574**
RAM Capacity Contracted	650	789	165	**1,604**
Capacity Remaining	**0**[40]	**0**	**0**	**0**

Data Source: CPUC RPS Database, October 2018

Feed-in Tariff Programs

California's Feed-in Tariff (FIT) program is a policy mechanism designed to accelerate investment in small, distributed renewable energy technologies. The goal of California's Feed-in Tariff programs is to offer long-term contracts and price certainty that aid in financing renewable energy investments. 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 load served.

[39] See Commission Decision (D).14-11-042 for more information on the RAM program. Although PG&E and SDG&E filed requests to eliminate their remaining RAM procurement obligations, the CPUC denied the requests.
[40] Because PG&E procured within 20 MW of its total incremental RAM targets, PG&E has met the RAM requirements pursuant to D.14-11-042.

Renewable Market Adjusting Tariff (ReMAT)

ReMAT is an IOU procurement program that provides market-based adjusting prices for small RPS-eligible facilities (generating up to 3 MW) to sell renewable electricity to utilities under standard terms and conditions.

The ReMAT program was established by SB 32 (Negrete McLeod, 2009) and SB 2 (1X) (Simitian, 2011) and commenced in 2013 offering a fixed-price standard contract to export electricity to California's three large IOUs. 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. Recently, AB 1979 modified the program to increase the maximum project capacity to 4 MWs for conduit hydroelectric facilities, if they deliver no more than 3 MW.

The ReMAT Program was indefinitely halted on December 15, 2017 due to a Federal Court Order.[41] PG&E, SCE and SDG&E were ordered to: (1) not sign new ReMAT contracts, (2) suspend holding any ReMAT Program Periods, and (3) not accept any ReMAT applications pending further Commission notice.

Table 14 provides an overview of the progress that each IOU has made toward their ReMAT capacity mandate from the program's inception in 2013 to present. The IOUs have collectively procured 256 MW out of their total 494 MW ReMAT requirement, so the program has a total of 238 MW of capacity remaining.

Table 14: ReMAT Mandated Allocations by Large IOU (MW)

	PG&E	SCE	SDG&E	Total
Total ReMAT Procurement Requirement	219	226	49	**494**
ReMAT Capacity Contracted	97	136	23	**256**
Capacity Remaining	**122**	**90**	**26**	**238**

Data Source: CPUC RPS Database, October 2018

Bioenergy Market Adjusting Tariff (BioMAT)

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

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 distinct bioenergy areas of Biogas, Agriculture, and Sustainable Forest Management. Table 15 shows the BioMAT targets and capacity (MW) procured over the life of the program by the three IOUs.

[41] 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 CPUC orders implementing the ReMAT program are not compliant with the Public Utilities Regulatory Policies Act (PURPA). Litigation is currently pending in the Ninth Circuit U.S. Court of Appeals.

Biogas: From January through June of 2018, three biogas contracts were executed by PG&E and SCE for a total of 5.3 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 MW of capacity. All contracts in this category have been executed at the program starting price of $127.72/MWh.

Agriculture: This category consists of Dairy and Other Agriculture sub-categories. Since the start of 2018, eight dairy contracts have been executed by PG&E and SCE for a total of 7.1 MWs. Seven of these projects accepted prices for Dairy contracts, and the other project accepted a price in the Other Agriculture sub-category. There has been a total of 11 dairy contract executions in PG&E's and SCE's service territories for a total of 12.1 MW of capacity. All contracts in this category have been executed at a price of $187.72/MWh.

Sustainable Forest Management: Since the beginning of 2018, three Sustainable Forest Management contracts have been executed by PG&E for a total of 7.9 MW. All contract executions in this category have occurred at a price of $199.72/MWh.

Table 15: BioMAT Mandated Allocations and MWs Contracted

BioMAT Category	BioMAT MW Allocation	MW Contracted
Biogas	110	13
Dairy/Agriculture	90	12
Sustainable Forest Management	50	8
Total	**250**	**33**

Data Source: CPUC RPS Database, October 2018

In November 2017, the Sustainable Forest Management Category offer price surpassed the program's $197/MWh "soft cap" price for two consecutive program periods. Pursuant to the program rules adopted in 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. As a result, the CPUC sent a letter to the IOUs on November 28, 2017 announcing the start of a BioMAT program review and instituting a temporary price cap to prevent the Category 3 offer price from increasing above $199.72/MWh unless a seller commits to using at least 60% High Hazard Zone (HHZ) fuel. [42]

In October 2018, Energy Division issued a draft program review document that includes staff's proposal for BioMAT program changes and invites public comment and stakeholder collaboration. The goal of the program review is to assess program performance to date and recommend programmatic and procedural changes to simplify the BioMAT procurement process, enable expanded program participation, address program barriers, reduce ratepayer expenditures, and help achieve statewide goals.

[42] 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. They 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.

Additionally, in October 2018, the CPUC issued a proposed decision to implement changes to interconnection rules for the BioMAT program in accordance with Assembly Bill (AB) 1923. The proposed decision determines that a facility may participate in BioMAT if it interconnects to an existing transmission line owned by a utility, revises the definition of "strategically located" facilities,[43] confirms the cap on interconnection upgrades applies to existing transmission lines, and adopts a program deposit amount for facilities that drop out of the CAISO interconnection queue.

Bioenergy Renewable Auction Mechanism

The Bioenergy Renewable Auction Mechanism (BioRAM) program used the RAM process to implement the Governor's October 2015 Emergency Order Addressing Tree Mortality, as well as emergency strategies set out in SB 859.[44] BioRAM requires the large IOUs to procure 146 MWs of bioenergy from forest fuel in High Hazard Zones (HHZ)[45] from dead and dying trees to aid in mitigating the threat of wildfires. Table 16 lists the IOUs' BioRAM contracts that comply with the state's emergency orders.

Table 16: IOU BioRAM Procurement in 2017

IOU	Facility	Location	Capacity (MW)	BioRAM Phase
PG&E	Burney	Shasta County, CA	29	BioRAM 1
PG&E	Wheelabrator Shasta	Shasta County, CA	34	BioRAM 2
SCE	Rio Bravo Fresno	Fresno County, CA	24	BioRAM 1
SCE	Rio Bravo Rocklin	Placer County, CA	24	BioRAM 1
SCE	Pacific Ultrapower Chinese Station	Tuolumne County, CA	18	BioRAM 1
SDG&E	Honey Lake Power Company / Greenleaf	Lassen County, CA	24	BioRAM 1
Total			**153**	

Data Source: CPUC RPS Database, October 2018

[43] In the Proposed Decision, the definition of "strategically located" is revised to read that the generator be (1) interconnected to the distribution system or the transmission system, and (2) sited near load, meaning in an area where the cost of upgrades for interconnection of the proposed generation to the distribution or to an existing transmission system does not exceed $300,000, or if the developer pays all transmission upgrade costs in excess of $300,000.

[44] Senate Bill 859 (2016) directs the CPUC to extend contracts for biomass facilities and addresses the statewide tree mortality issue by requiring that 60% of forest biomass used to create bioenergy is harvested from Tier 1 and Tier 2 high hazard zones. More recently, Governor Brown signed SB 901 (2018), which modifies the HHZ definition and directs additional options for certain BioRAM contracts.

[45] For more information on California's Tree Mortality Task Force and high hazard zone areas, see CALFIRE's website: http://www.fire.ca.gov/treetaskforce/

Tracking High Hazard Zone Forest Fuel Requirements for BioRAM

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 2018, the IOUs completed audits on each facility's 2017 HHZ fuel usage. Table 17 shows the amount of HHZ fuel used in 2018 as part of BioRAM contracts. This data reflects the six BioRAM facilities listed in Table 16.

Table 17: High Hazard Zone (HHZ) Forest Fuel Usage in 2017 from BioRAM 1 Contracts

Total HHZ Used (BDT)[46]	BioRAM 1 HHZ % Requirements	Average % of Total Biomass Fuel from HHZ Fuel
383,627	50%	60.5%

Data Source: CPUC Aggregated Data from IOUs, September 2018

HHZ Fuel Availability Study

In response to stakeholder concerns that BioRAM facilities may be unable to access enough HHZ forest fuel to achieve their requirements, the CPUC is working with key stakeholders to undertake a HHZ Fuel Availability Study (HHZ Study). Through the Bioenergy sub-working group of the Governor's Forest Management Task Force, the CPUC is working collaboratively with CAL FIRE, CEC, PG&E, California Biomass Energy Alliance, and the U.S. Forestry Service to manage the study's assessment of the availability and cost of using HHZ fuel for bioenergy. The HHZ Study also provides an analysis of barriers and solutions to HHZ fuel use or supply.

The CPUC anticipates that the HHZ Study will be completed by the first half of 2019. The HHZ Study is expected to inform stakeholders on the availability of HHZ biomass and appropriate strategies for addressing bioenergy within the framework of the State's wildfire prevention goals.

BioRAM Non-Bypassable Charge Proceeding

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 preventing wildfires. In 2017, the CPUC began the process to establish the mechanism to allocate costs from these programs to all customers. In 2018, parties in the BioRAM Non-Bypassable Charge (NBC) proceeding[47] litigated how BioRAM procurement costs should be allocated to customers. Key issues in the proceeding included what methodology should be used to determine total costs, including how Renewable Energy Credits and Resource Adequacy should be valued. A Commission decision on the NBC is anticipated in late 2018.

[46] Bone Dry Tons, which is a 1:1 equivalent with megawatt-hours (MWh), refers to the measurement of biomass that has a zero percent moisture content.
[47] See CPUC Application (A).16-11-005 for all documents pertaining to the BioRAM NBC proceeding.

RPS Compliance and Enforcement

In 2018, the CPUC implemented and administered RPS Compliance rules for California's retail sellers of electricity subject to CPUC jurisdiction, which include the IOUs, SMJUs, CCAs, and ESPs. In August 2018, these entities were required to submit annual Compliance Reports describing their progress towards the State's RPS mandate. The Commission issued a decision[48] in May 2018 implementing SB 350 mandated changes to the RPS enforcement process. This decision was the final of a series of three decisions to implement SB 350. The decision continued the existing schedule of penalties for retail sellers and the process by which retailers may seek a waiver of some, or all, of their RPS obligations.

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 program. After reviewing the compliance reports for Compliance Period 1 (2011-2013), the CPUC made final compliance determinations and determined that six retail sellers were non-compliant with their RPS procurement obligations.

The six retail sellers who were non-compliant with California's RPS program in Compliance Period 1 (2011-2013) include: Commerce Energy (Just Energy Solutions), Commercial Energy of California, Direct Energy Business, Gexa Energy California, Liberty Power Holdings, and Tiger Natural Gas.

All six retail sellers were non-compliant with their Procurement Quantity Requirements (PQR).[49] While one retail seller procured enough RECs, it did not meet the long-term contracting requirement and could not count its procurement towards its PQR.[50] Four retail sellers accepted the Commission's determination and paid their non-compliance penalties. Two retail sellers, Gexa Energy California and Liberty Power Holdings, have filed for waivers for their respective RPS penalties under Section 399.15 of the Public Utilities Code. These requests for waiver are currently pending before the Commission.

The fourteen compliant retail sellers include: 3 Phases Renewables, Bear Valley Electric Service, Calpine Energy Solutions, Constellation New Energy, EDF Industrial Power Services, Liberty Utilities, Marin Clean Energy, Noble Solutions, PacifiCorp, Pacific Gas and Electric, Pilot Power Group, Southern California Edison, San Diego Gas & Electric, and Shell Energy. The CPUC expects to make final determinations for Compliance Period 2 in early 2019, contingent upon the availability of the retail seller's verified REC claims.

[48] See Decision (D.)18-05-026 "*Decision Implementing Senate Bill 350 Provision on Penalties and Waivers in the Renewables Portfolio Standard Program and Denying Petition for Modification of Decision 17-06-026*", for more information.
[49] The Procurement Quantity Requirement (PQR) is defined as the statutory percentage of RPS-eligible procurement required per year in a compliance period multiplied by the total retail sales of each year in the compliance period.
[50] See D.17-06-026 for more information on the long-term contracting rules.

Early Compliance

In the Commission's decision revising compliance requirements in accordance with SB 350, retail sellers were given the opportunity to elect early compliance with the new long-term contracting requirements.[51] The new SB 350 provisions apply to all retail sellers beginning in Compliance Period 4 (2021-2024) and for retail sellers who elect to early comply they apply in Compliance Period 3 (2017-2020). Out of 29 retail sellers serving load in 2017, six elected for early compliance with the 65% long-term contracting rule:

Table 18: Early Compliance Elections

	Name of Retail Seller	Retail Seller Type
1.	Pacific Gas and Electric Company	IOU
2.	San Diego Gas & Electric Company	IOU
3.	Southern California Edison Company	IOU
4.	Bear Valley Electric Service	SMJU
5.	PacifiCorp	SMJU
6.	The Regents of the University of California	ESP

Once the retail seller has made the election to early comply with the long-term contracting rules, they may not revoke or change their choice. The six retail sellers listed above are required to procure 65% of their RPS requirements from long-term contracts in Compliance Period 3.

After making the early election, retail sellers were required to detail the impact that early complying would have on their ability to meet the RPS procurement requirements in their Procurement Plans. All retail sellers discussed the impact that early compliance would have on their portfolios in their updated Draft 2017 RPS Procurement Plans. The six retail sellers already have enough long-term contracts in their portfolios and thereby complying early with the 65% requirement will likely not impact their ability to meet the RPS. The Commission accepted the Draft RPS Plans in D.17-12-007.

[51] 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.

Long-Term Contracting Requirement

Pursuant to RPS statute, all electric retail sellers must procure a specified percentage of their RPS portfolio from long-term contracts, defined as 10 or more years. For the first three compliance periods, 0.25% of the total RPS procurement must come from long-term contracts. Beginning in Compliance Period 4 (2021-2024), 65% of RPS procurement must come from long-term contracts. The section below uses RPS procurement data to identify the status and progress of all retail sellers in meeting the 65% long-term contracting requirement.

Large Investor-Owned Utilities: The three large IOUs are well-positioned to meet the 65% long-term contracting requirement by the end of Compliance Period 4. Nearly all RPS contracts executed by the three IOUs for the purposes of complying with the RPS program have contract term lengths of ten or more years.

Small and Multi-Jurisdictional Utilities: Similar to the large IOUs, the SMJUs are also well-positioned to meet the 65% long-term contracting requirement. Bear Valley Electric Service (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 Utilities 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 4, Liberty is sufficiently procured to meet its long-term contracting requirement. Lastly, nearly all of PacifiCorp's RPS procurement from 2018 through 2030 is derived from long-term contracts. PacifiCorp has two short-term contracts for RPS energy in 2018.

Community Choice Aggregators: Out of the nineteen CCAs that are currently serving load, three[52] have already procured long-term contracts above the 65% requirement, four[53] have procured some long-term contracts but need to procure more to meet the 65% requirement, eleven[54] have procured only short-term contracts, and one has not procured any RPS energy.[55]

Table 19: Total CCA Long-Term Procurement to Meet 65% Requirement Compliance Period 4 (2021-2024)

Total Long-Term Procurement Requirement (GWh)[56]	51,198
Total Long-Term Contracts Procured (GWh)	23,013
Percentage of Requirement Satisfied	45%

Data Source: CCA RPS Compliance Reports, August 2018

[52] The three CCAs are Marin Clean Energy, Peninsula Clean Energy, and Sonoma Clean Power.
[53] The four CCAs are CleanPowerSF, Lancaster Choice Energy, Monterey Bay Community Power, and Silicon Valley Clean Energy.
[54] The eleven CCAs are Apple Valley Choice, Clean Power Alliance, East Bay Community Energy, Pico Rivera, Pioneer Community Energy, Rancho Mirage, Redwood Coast, San Jacinto, San Jose, Solana Energy Alliance, and Valley Clean Energy.
[55] King City Community Power has not procured any RPS energy as of the time of this report.
[56] The long-term procurement requirement is the forecasted total CCA procurement quantity requirement multiplied by 65% in Compliance Period 4 (2021-2024).

Electric Service Providers: Historically, ESPs have procured the minimum quantity required for long-term contracting. Most ESPs do not provide load forecasts more than a few years out, making it difficult to forecast their long-term procurement requirement beyond the near term. Of the ten ESPs that provided procurement data for their long-term forecasts, only one of them (UC Regents) has procured enough to meet the 65% long-term contracting requirement in Compliance Period 4.

Table 20: Total ESP Long-Term Procurement to Meet 65% Requirement Compliance Period 4 (2021-2024)	
Total Long-Term Procurement Requirement (GWh) [57]	17,187
Total Long-Term Contracts Procured (GWh)	1,679
Percentage of Requirement Satisfied	10%

Data Source: ESP RPS Compliance Reports, August 2018

[57] The long-term procurement requirement is the forecasted total ESP procurement quantity requirement multiplied by 65% in Compliance Period 4 (2021-2024).

RPS Procurement Plans

California's RPS program requires that all electricity retail sellers file annual RPS Procurement Plans (RPS Plans) to the CPUC. The RPS Plans allow the CPUC to monitor renewable procurement to ensure that the retail sellers are planning to meet their RPS requirements. The Plans provide an overview of the status of renewable procurement and generally describe both the need for additional resources and the actions proposed to obtain those resources.

Accordingly, each year, the CPUC reviews and approves RPS Plans for the large IOUs and SMJUs. While the CPUC also requires CCAs and ESPs to submit RPS Plans, the CPUC has limited oversight of their procurement activities such as solicitations, offer evaluations, and contract approvals. The CPUC's role is to review the Plans of the CCAs and ESPs to ensure that they comply with the CPUC's RPS Plan requirements.

CPUC RPS Plan Guidelines

The CPUC issues guidance each year, prior to the retail sellers submitting their annual RPS Procurement Plans. In June 2018, the CPUC issued a Ruling with a detailed list of criteria that the load-serving entities must address in their 2018 RPS Plans. The Plans must address the criteria listed below:

Criteria	Description
1. Assessment of RPS Portfolio Supplies and Demand	Details the RPS portfolio and technology mix and the percentage of power served with renewable resources. The demand assessment focuses on retail sales and annual procurement need.
2. Project Development Status Update	Update of development of RPS-eligible resources currently under contract. These resources may be either in development, under construction, or online.
3. Compliance Delays	Rationale for potential delays in achieving compliance with the RPS program.
4. Risk Assessment	Evaluation of risks associated with retail sales, generation, project failure, curtailment events, and project delays.
5. Quantitative Information	Quantitative information, such as retail sales forecasts, renewable net short calculations, and annual procurement data.
6. "Minimum Margin" of Procurement	Analysis of data on minimum margin of procurement, defined as the minimum amount of renewables needed to address anticipated project failure or delay.
7. Bid Solicitations	Bid selection protocols for procuring additional RPS resources
8. Price Adjustment Mechanisms	Include perspective on price-adjustment mechanisms in contracts and evaluate what impacts they will have on ratepayers.
9. Curtailment Frequency, Costs, and Forecasting	Detail on curtailment activities (e.g., economic curtailment) and how curtailment has affected RPS planning and compliance.
10. Cost Quantification	Annual summary of actual and forecasted RPS procurement costs and generation by technology type.
11. Safety Considerations	Information on RPS contract provisions related to safety of a facility's operations, construction, and decommissioning.

RPS Plan Implementation Schedule

The CPUC anticipates issuing a decision on the Draft 2018 RPS Procurement Plans in December 2018. The decision will either approve the utilities' proposed RPS Plans or order them to make modifications. Once any necessary modifications are made, the IOUs can commence implementation. The CPUC will initiate the next cycle of RPS Plans in the first half of 2019.

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 works with the California Energy Commission, California Air Resources Board, California Independent System Operator, and CAL FIRE on issues and projects such as: statewide RPS compliance and enforcement, the Forest Management Task Force and related Biomass Working Group, the California Offshore Wind Task Force, and transmission planning.

Compliance and Enforcement

The CPUC will continue to coordinate closely with the CEC to ensure a consistent policy approach for RPS compliance and enforcement. CPUC determinations on RPS compliance will rely on the verification report issued by the CEC. The CPUC will utilize the CEC's compliance verification report to inform its future RPS-related compliance determination decisions.

Tree Mortality and Bioenergy Issues

The issue of tree mortality and its impact on wildfires intersects with the RPS programs of BioMAT and BioRAM. To ensure that these programs address the State's policy goals, CPUC staff will continue to work with stakeholders and state agencies to address issues such as program costs, barriers to HHZ tree biomass procurement, protecting air quality, and program evaluation.

The CPUC will continue to participate 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. The CPUC is an active participant in the Governor's Forest Management Task Force. In addition, RPS staff participates in monthly meetings of the Bioenergy Working Group. The CPUC also engages in other related forums on this topic, such as the Little Hoover Commission.

Offshore Wind Task Force

The CPUC is a member of the California Offshore Wind Task Force, an inter-agency effort led by the CEC. 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 CPUC's role is to offer insight into the RPS procurement process and Commission procedures. In 2018, the CPUC participated in the Task Force with other California state agencies, as well as the U.S. Department of Defense and Bureau of Ocean Energy Management, to discuss the potential for offshore wind off the central and northern California coast. The CPUC anticipates working with the Task Force in the coming year, as the state considers the need for offshore wind and marine renewable energy as a resource.

Transmission Development Supporting RPS Implementation

Sycamore-Peñasquitos 230-kV Project

In 2016, the CPUC approved the SDG&E Sycamore-Peñasquitos 230 kV Transmission Project located in the City of San Diego.[58] The project began construction in January 2017 and was energized in August 2018.

The additional capacity of the 230-kV line will deliver renewable energy to SDG&E's customers and will assist the IOU in meeting its RPS goals. In addition to long term grid reliability, and in the absence of the San Onofre Nuclear Generating System (SONGS), the project will alleviate congestion on the power lines out of the Sycamore Canyon Substation, which will in turn support deliverability of renewable resources identified in SDG&E's RPS portfolio. Delivery of renewable energy entering Sycamore Canyon Substation via the Sunrise Powerlink is constrained by the current electrical system. Without this project, the lower capacity lines out of Sycamore Substation would become congested which would result in thermal overloads on power and transmission lines in the SDG&E system during peak summer demand.

West of Devers Upgrade Project

In 2016, the CPUC approved the West of Devers Upgrade Project in Riverside and San Bernardino counties.[59] It includes the removal and upgrade of the existing 220-kV transmission lines along a 45-mile area between Devers Substation and the Vista and San Bernardino Substations. The result will be the removal of all existing structures and replacing them with two sets of double circuit 220-kV transmission lines. The project will also include upgrades to five existing substations along with distribution and telecommunication work. Project completion and energization is presently estimated to be October 2021.

The project will increase the system transfer capacity from 1,600 MW to 4,800 MW and will be able to bring renewable generation to the grid for resources in eastern Riverside County. It will also facilitate deliverability of renewable energy resources in Southern California to meet the state's 60% RPS requirement.

Suncrest Dynamic Reactive Power Support Project

As part of its 2013-2014 transmission planning process, the CAISO determined that the Suncrest Dynamic Reactive Power Support Project was needed to address voltage stability issues on the grid. Voltage stability refers to the ability of power systems to maintain a steady voltage, which is necessary to ensure that the system provides continuous, reliable power to all users. CAISO selected the NextEra Energy Transmission West (NEET) project through a competitive solicitation after finding that the project met stringent bid requirements to address forecasted increases in renewable generating capacity in the Imperial Valley, due to the retirement of the San Onofre Nuclear Generating Station (SONGS).

In September 2018, the CPUC approved NextEra Energy Transmission West's (NEET) application to construct an upgrade at or near SCE's Suncrest Substation.[60] The Suncrest Dynamic Reactive Power Support Project will facilitate compliance with the RPS program by allowing the deliverability of 1,000 MW of renewable generating capacity located in the Imperial Valley Area.

[58] See the CPUC's website: http://www.cpuc.ca.gov/Environment/info/panoramaenv/Sycamore_Penasquitos/index.html
[59] See the CPUC's website: http://www.cpuc.ca.gov/environment/info/aspen/westofdevers/westofdevers.htm
[60] See the CPUC's website: http://www.cpuc.ca.gov/Environment/info/horizonh2o/suncrest/index.html

Summary of 2017 / 2018 Accomplishments

July 2017	▪ CPUC adopts D.17-06-026 implementing SB 350 ▪ IOUs, CCAs, and ESPs submitted their Draft RPS Procurement Plans to the CPUC ▪ SCE contracted a 2 MW municipal BioMAT project ▪ PG&E contracted a 1 MW existing small hydro project under the ReMAT Program
August 2017	▪ IOUs, CCAs, and ESPs submitted their RPS Compliance Reports to Energy Division ▪ CPUC issued D.17-08-021 implementing AB 1979 with revisions to ReMAT ▪ CPUC issued D.17-08-021 implementing AB 1923 expanding eligibility for BioMAT participants ▪ SDG&E contracted a 3 MW project for Municipal BioMAT
September 2017	▪ PG&E contracted a 3 MW dairy biomass project under the BioMAT Program
October 2017	▪ CPUC issued a Staff Proposal via Ruling to implement AB 1923's provision to interconnect to existing transmission ▪ PG&E contracted a 5 MW forest biomass project under the BioMAT Program
November 2017	▪ CPUC issued a proposed decision on 2017 RPS Procurement Plans ▪ CPUC issued the 2017 RPS Annual Report to the Legislature
December 2017	▪ SDG&E executed a 105 MW wind contract for its RAM 7 solicitation ▪ PG&E launched its RAM solicitation ▪ CPUC issued a final decision on 2017 RPS Procurement Plans
January 2018	▪ PG&E executed eight BioMAT contracts for a total capacity of 6.5 MW ▪ SCE executed two BioMAT contracts for a total capacity of 1.6 MW
February 2018	▪ PG&E issued a solicitation to sell short-term and long-term RECs ▪ PG&E executed a 2 MW biogas contract for the BioMAT program
March 2018	▪ SCE submitted an application for termination of geothermal contracts ▪ SCE executed three BioMAT contracts for a total capacity of 7.3 MW
April 2018	▪ SDG&E issued a solicitation to sell short-term and long-term RECs
May 2018	▪ CPUC issued the 2018 Padilla Report on Costs and Cost Savings for the RPS Program to the Legislature, pursuant to Public Utilities Code 913.3 ▪ CPUC adopts D.18-05-026 implementing SB 350
June 2018	▪ CPUC approved PG&E's request to sell RPS-eligible energy through its solicitation to sell short-term RECs

IV. 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). The statute requires the CPUC to report on the efforts of California's electrical corporations and community choice aggregators related to workforce development, training, and diversity.

This chapter provides details on the large IOUs, SMJUs, and CCAs related to the current RPS workforce, diversity of staff, strategies used to recruit a diverse staff and develop RPS and other clean energy staff of the future, and training provided for their current and future workforce.

The CPUC gathered information on the above topics directly from the IOUs, SMJUs, and CCAs. This chapter first describes the workforce development of the IOUs and is followed by information on the SMJUs and CCAs.

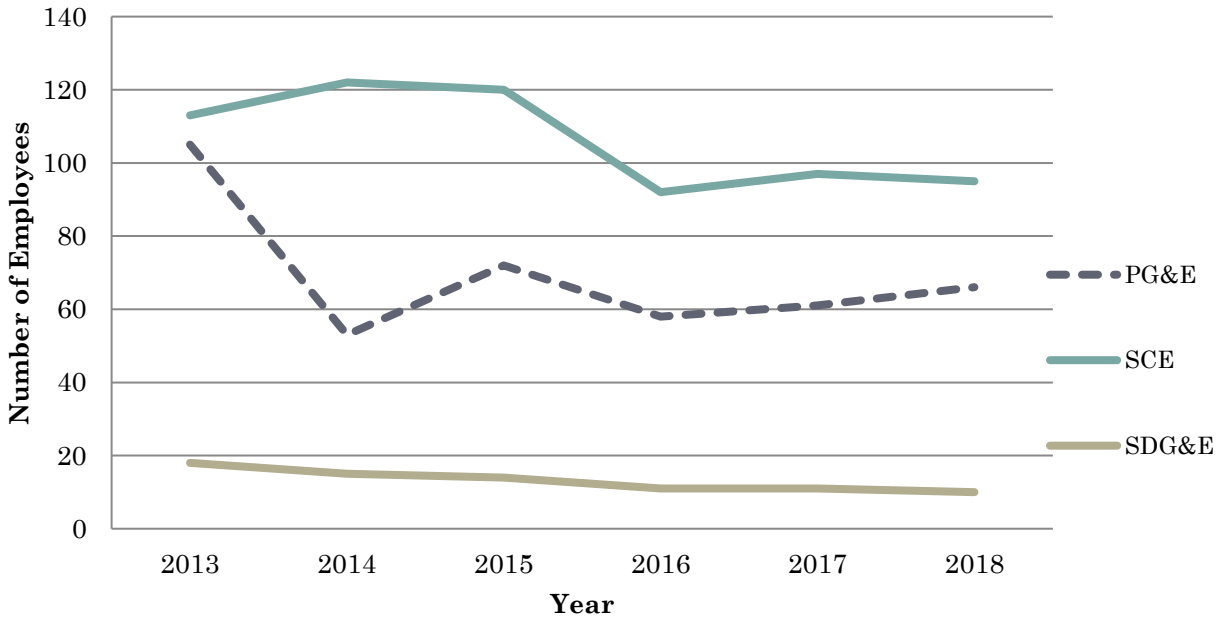
IOU Workforce Development

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

Figure 9 provides an overview of the number of full-time PG&E, SCE, and SDG&E employees who have worked on RPS-related issues from 2013-2018. This graph illustrates how the IOUs' RPS staffs have changed over the past six years.[61]

Figure 9: Full-time RPS Employees at Large IOUs (2013-2018)



Data Source: PG&E, SCE, and SDG&E, July 2018

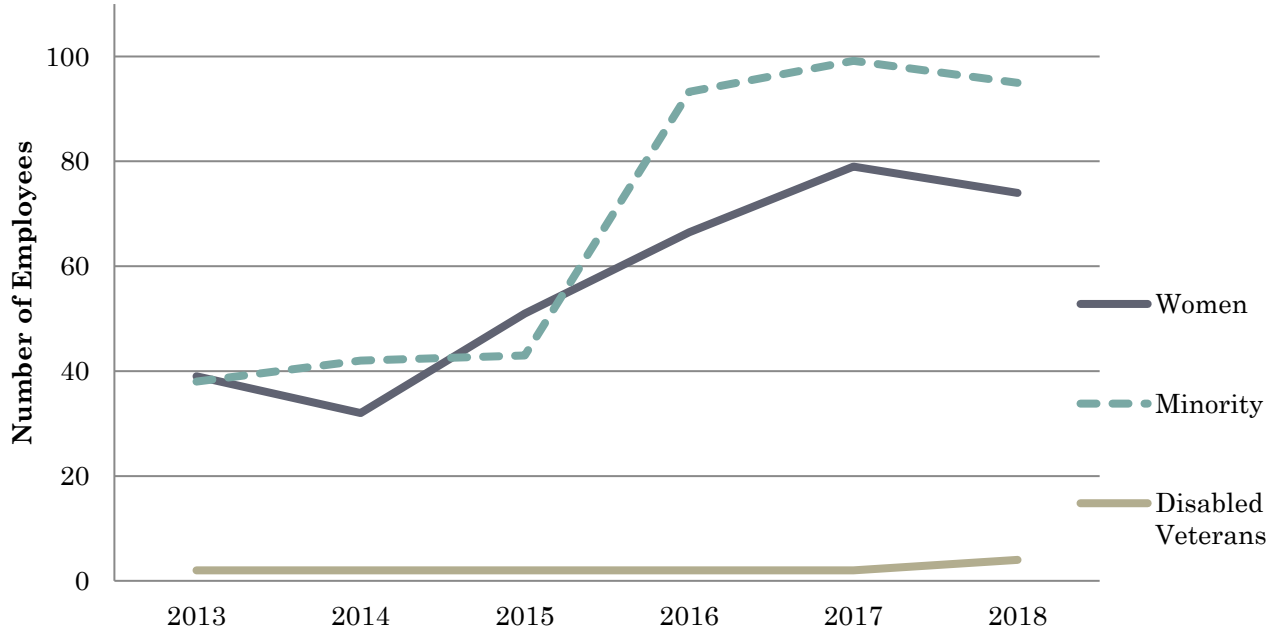
[61] This time series data is current as of August 2018 and includes employment data from January 2013 through July 2018.

IOU Current RPS Workforce Diversity

The IOUs have 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 for the purposes of implementing the RPS program.[62]

In 2018, all three large IOUs reported working with organizations focused on professional development for women, minorities, and disabled veterans. They were also compliant with General Order 156 [63] requirements on supplier diversity. Figure 10 illustrates aggregated data on the number of Women, Minorities, and Disabled Veterans who are full time employees at the three large IOUs who work on the RPS program.[64]

Figure 10: Total Women, Minority, and Disabled Veteran Employees at Large IOUs (2013-2018)



Total RPS Employees at Large IOUs						
	2013	**2014**	**2015**	**2016**	**2017**	**2018**
Totals	236	190	206	161	169	171

Data Source: PG&E, SCE, SDG&E, July 2018

[62] PG&E, SCE, and SDG&E do not track if their employees identify as Lesbian, Gay, Bisexual, and Transgender (LGBT). While the three large IOUs do not collect data on LGBT employees, they do have supplier diversity requirements as set out in General Order 156 and are required to submit an annual Supplier Diversity Report.

[63] 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 Sections 8281-8286.

[64] 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%). Employees may fall into multiple categories (i.e. minority women or female disabled veterans) and their time may be distributed between the RPS program and other functions.

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 RPS staff. In 2018, 77% of PG&E's RPS staff was comprised of women, minorities, or disabled veterans.[65]

Table 21: Number of Women, Minority, and Veteran RPS Employees from 2013-2018 (PG&E)

	RPS Employees (Full-Time)					
	2013	2014	2015	2016	2017	2018
Women	39	20	36	13	27	24
Minority	37	35	32	28	29	25
Veterans	2	2	2	2	2	2
Total RPS Staff	105	53	72	58	61	66

Southern California Edison (SCE):

SCE reported that 38% of the company's RPS employees are women and 61% identify as minorities. Table 22 below shows the number of SCE's RPS employees that are women, minority, or disabled veterans. In 2018, approximately 98% of SCE's total RPS staff was comprised of women, minorities, or disabled veterans.

Table 22: Number of Women, Minority, and Disabled Veteran RPS Employees from 2013-2018 (SCE)

	RPS Employees (Full-Time)					
	2013	2014	2015	2016	2017	2018
WMDV[66]	73	81	84	69	97	94
Women	No Data				38	36
Minority	No Data				59	58
Total RPS Staff	113	122	120	92	97	95

[65] PG&E reports that two employees working on the RPS Program are U.S. military veterans, but neither report having a disability.

[66] 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 that 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%), 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's time dedicated to the RPS program may range from 0 to 100%.

Table 23: Number of Women, Minority, and Disabled Veteran RPS Employees from 2013-2018 (SDG&E)

	RPS Employees (Full-Time)					
	2013	2014	2015	2016	2017	2018
Women	No Data	12	15	13	14	14
Minority	No Data	7	11	11	11	12
Disabled Veterans	No Data				2	2
Total RPS Staff	18	15	14	11	12	10

SDG&E reported having one RPS contract in 2018 with a minority owned business enterprise. SDG&E uses a qualitative component when evaluating contracts to determine which projects are the best fits for SDG&E's 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 broader recruiting efforts, PG&E frequently utilizes online job boards and reaches out to prospective candidates through websites such as LinkedIn, Getting Hired, CareerBuilder, and America's Job Exchange.

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. Open positions at PG&E are frequently posted on electronic job boards targeted to diverse recruitment, such as GettingHired.com, which is a website targeted towards candidates with disabilities. However, PG&E has not reported a formal company policy outlining the strategies for increasing the number of women, minority, disabled veterans, and LGBT employees working on specific programs such as the RPS.

University Outreach:

PG&E has a "University Programs" team primarily focused on collegiate recruitment on California college campuses such as University of California (UC) San Diego, UC Davis, UC Merced, Cal Poly San Luis Obispo, Sacramento State, and Chico State. The University Programs team targets recent college graduates who have studied engineering, finance, business, information technology, and environmental science.

Special Programs:

PG&E administers a separate recruitment and training program called PowerPathway which consists of a partnership with community colleges throughout PG&E's service territory. The PowerPathway program has two separate efforts – the Affinity Program and PG&E's Signature Program.

- **Affinity Program:** PG&E partners with local community colleges by providing input on certificate and degree curriculums focused on the needs of the utility industry. The team also partners with college staff to identify PG&E subject matter experts and guest speakers to give in-class presentations.

- **Signature Program:** PG&E works with the Workforce Development community to design and deliver training programs that improve access to skilled trades education for those in historically underserved communities. In addition, the programs provide up to three years of career coaching for program graduates.

From 2008 through June 2018, the PowerPathway Signature Program has mentored 920 program graduates. In the ten years that PowerPathway has been operational, it has been a successful diversity pipeline with approximately 67% of participants who are women, minorities, and/or veterans. PG&E reports that 52% of graduates are military veterans and 11% are women. Of those graduates, 54% were hired into full time positions at PG&E and 24% of graduates went on to pursue other industry-related careers. In 2017, PG&E piloted a new PowerPathway Skilled Trades internship program, which provides practical experience for those interested in becoming part of the future utility workforce.

K-12 Outreach & Education:

In addition to working with university and community colleges, PG&E supports programs that expose middle and high school students to careers in energy.

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 they post videos for the public on a variety of topics including the electricity grid of the 21st century, updates on renewable energy project developments, 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 U.S. Business Leadership Network, a business-to-business national membership organization that focuses on sharing and developing strategies for inclusion of people with disabilities in the workplace.

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 the East Los Angeles Skills Center to help prepare interested students for energy careers. In 2017 and 2018, SCE employed 43 interns from California Polytechnic University Pomona, where 27 of those interns went on to become full-time employees after graduation. In addition, SCE's summer internship program has approximately 150 interns each summer.

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 September 2017 through July 2018, 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 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:

SDG&E places a large emphasis on college recruiting and recruitment from diverse professional development organizations including the Society of Women Engineers, National Society of Black Engineers, and the Society of Mexican-American Engineers. 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. For recruiting, SDG&E also leverages social media websites focused on professionals

in energy with diverse backgrounds such as Women Working in Utilities, American Association of Blacks in Energy, 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 September 2017 through August 2018, approximately 11,000 K-12 students have completed the program.

In 2018, SDG&E is continuing 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 their RPS staff, the three SMJUs (Bear Valley Electric Service, Liberty Utilities, PacifiCorp) have fewer resources dedicated to RPS workforce development compared to the IOUs.

Bear Valley Electric Service (BVES)

In 2018, approximately 62% of BVES's total RPS staff was comprised of women and minorities. Table 24 below shows the number of BVES's RPS employees that are women, minority, or disabled veterans.

Table 24: Number of Women, Minority, and Veteran RPS Employees from 2017-2018 (BVES)

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

Data Source: Bear Valley Electric Service, July 2018

Additionally, in both 2017 and 2018, BVES executed one contract with a minority owned business enterprise.

BVES has not engaged in college recruitment efforts or offered scholarships to students within their 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 2018, approximately 36% 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
Women	2	2
Minority	0	2
Disabled Veterans	0	0
Total RPS Staff	9	11

Data Source: Liberty Utilities (formerly CalPeco), July 2018

Of the three SMJUs, Liberty Utilities is the only utility to engage in recruitment efforts with local high schools and universities. During the summer of 2017, Liberty attended a career fair at the University of Nevada,

Reno and recruited two student engineers for positions after graduation. Liberty also posts job opportunities on career fair web portals at local universities. Liberty Utilities offers scholarships to graduating high school students within the service territory and offers one 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 2018, Liberty hired two additional employees to implement the RPS program, both of which are minority recruits.

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 related issues throughout all states served by PacifiCorp.

Given that PacifiCorp employs one employee who oversees the RPS program in all states served by PacifiCorp, no specific diversity statistics were provided.

CCA Workforce Development

Pursuant to Public Utilities Code 913.4(f), the CPUC requested data from all nine CCAs that were operational in 2017. The CPUC received responses from six out of the nine CCAs. The CCAs that did not submit a response to the data request include Apple Valley Choice Energy, Lancaster Choice Energy, and Pico Rivera Innovative Municipal Energy. Accordingly, the CPUC cannot report on the workforce development and diversity activities of these entities, and the following information is limited to information from CleanPowerSF, Marin Clean Energy, Peninsula Clean Energy, Redwood Coast Energy Authority, Sonoma Clean Power, and Silicon Valley Clean Energy.[67]

The CCAs[68] 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 includes providing equal employment opportunities in their employment practices, fair compensation, quality training and apprenticeship programs, and the development of locally based jobs.

Table 26: Total Number of RPS Employees from 2016 – 2018 (CCAs)

	2016	2017	2018
CleanPowerSF	0	3	3
Marin Clean Energy	38	42	56
Peninsula Clean Energy	2	4	4
Redwood Coast Energy Authority	N/A	7	7
Sonoma Clean Power	5	6	6
Silicon Valley Clean Energy	N/A	2	4
Total RPS Staff	45	64	80

Data Source: CPSF, MCE, PCE, RCEA, SCP, and SVCE, 2018

In 2018, the CCAs reported engaging in business and workforce initiatives located in low-income and disadvantaged communities. Table 26 shows the amount of total RPS employees at each CCA that responded to the CPUC's data request and 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 Veteran RPS Employees from 2016 – 2018 (CCAs)

	2016	2017	2018
Women	28	42	49
Minority	11	16	24
Disabled Veterans	No Data	No Data	No Data
Total RPS Staff	45	64	80

[67] While CleanPowerSF, Marin Clean Energy, Peninsula Clean Energy, Redwood Coast Energy Authority, Sonoma Clean Power, and Silicon Valley Clean Energy provided responses to the data request, their responses also included claims that the Commission did not have the authority to request workforce development data from them.
[68] Refers to the CCAs that responded to the CPUC's data request.

CleanPowerSF (CPSF)

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

CPSF is working with construction labor unions to provide local jobs for two new in-state RPS projects, the San Pablo Raceway solar project and Voyager Wind IV wind project. The San Pablo Raceway project will include ten full-time operations-related positions and approximately 500 construction jobs during the construction period. The Voyager Wind IV project will have six full-time positions and at its peak, approximately 100 construction jobs during the construction period.

Marin Clean Energy (MCE)

MCE currently employs a full-time staff of 56 employees across six teams: Power Resources, Public Affairs, Customer Programs, Legal, Regulatory and Legislative Policy, and Internal Operations. While MCE's Power Resources, Regulatory and Legislative Policy, and Legal teams focus more directly on legal and regulatory compliance with the RPS program, MCE staff receives high-level training on power resources procurement and RPS related issues as part of MCE's employee on-boarding process.

MCE offers its employees an annual professional development budget to attend conferences and trainings to keep skill-sets and knowledge up to date. Since 2015, MCE estimates that 55 employees have undergone training sessions on California's RPS program as part of the on-boarding training at MCE.

Peninsula Clean Energy (PCE)

PCE engages in a variety of activities to ensure open employment positions reach as broad an audience as possible. Those strategies include placement of 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 who 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.

In support of locally-sourced employment and workforce development in California, PCE has partnered with various labor unions on two new solar projects, Mustang Solar Power and Wright Solar Park. Mustang Solar is a 100 MW solar facility located in Kings County. Mustang is 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 450 jobs during peak construction. Wright Solar Park is a 200 MW facility located in Merced County. Wright is subject to a project labor agreement with IBEW Local 100 and 684, Ironworkers Local 155, Engineers Local 3. PCE anticipates the project will support 350 jobs during 2018 and 2019.

Redwood Coast Energy Authority (RCEA)

RCEA was established in 2003 and provides an array of energy-related services to Humboldt County, CA. RCEA has been operating its community choice energy (CCE) program since May 2017 and procures RPS renewable energy credits (RECs) as part of its power procurement. RCEA hired new staff to perform CCE-related activities including RPS procurement, as well as adding CCE activities to the job descriptions of existing staff. RCEA advertises job openings for new CCE-specific positions in local publications and through its website (redwoodenergy.org).

RCEA provides informal, in-house training on RPS topics to its staff through mentoring and peer-to-peer education. RCEA also provides funding and work release time for staff to attend off-site conferences and workshops on RPS-related topics such as CAISO operations and load forecasting. RCEA provides funding for staff to purchase books and other publications on RPS-related topics and encourages staff to identify and participate in relevant webinars.

In addition to meeting its own staffing needs, RCEA's RPS power procurement has contributed to local employment growth and job retention in Humboldt County. Procurement of biomass power from two plants in the county has created or preserved 47 direct jobs at these plants. In addition, it is estimated by the plant operators that indirect employment associated with restarting or maintaining these plants accounts for an additional 140 jobs.

Sonoma Clean Power (SCP)

SCP is an equal opportunity employer that strives for diversity in its hiring practices. Outreach is general and is not based on specific demographics (women, minority, or disabled veterans). SCP's staff whose workload includes RPS-related activities are encouraged and guided to educate themselves on the details of California's RPS program. SCP has 22 full-time employees and does not track statewide employment statistics for all its RPS projects.

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.

V. RPS CHALLENGES AND POLICY RECOMMENDATIONS

Public Utilities Code 913.4 requires the CPUC to identify barriers to achieving the RPS and to propose recommendations to address those barriers. This section 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 load forecasting uncertainty, increased curtailment incidents, meeting the state's greenhouse gas (GHG) emissions reductions targets and zero-carbon goals, coordination between the IRP and RPS proceedings, and addressing the state's wildfire crisis.

Challenge 1: Uncertainty in Load Forecasts

Issue: The growth in the number of registered CCAs and the growing trend of IOU customers transitioning to CCAs makes it increasingly difficult to forecast future IOU load. Over the past year, CCAs have increased in both numbers and amount of customers served, with a total of twenty CCAs in California to date. Eleven CCAs are in PG&E's service territory, eight are in SCE's service territory, and one is in SDG&E's territory. Further CCA growth will mean even more load migration from the three IOUs and a higher proportion of RPS energy in their portfolios. Current CPUC estimates suggest that over 3.3 million residential and commercial customer accounts will be served by CCAs for their generation needs by 2019. In their forecasting scenarios, IOUs have estimated that they could lose 60 to 80 percent of their current demand in the next 8 to 10 years.

As additional CCAs are formed, the CPUC will oversee a smaller percentage of renewable procurement in the state, as the CPUC has limited jurisdiction over the procurement activities of CCAs and ESPs. The CPUC will have limited monitoring of renewable energy procurement activities, including solicitations or Requests for Offers, which may cause challenges in the IRP process due to the CPUC's lack of market visibility.

Because of significant departing load, there is a smaller rate base of customers over which to allocate energy costs. Policies established now but implemented after the load has departed could result in stranded costs and rate shock for remaining bundled IOU customers. Parties are challenging the current mechanisms in place to prevent IOU ratepayers from paying for stranded assets, most notably in the proceeding for the Power Charge Indifference Adjustment (PCIA).

Recommendation: The CPUC has opened other proceedings to develop solutions to these challenges. Any new procurement strategies should consider the impact of policies on ratepayers in the context of weighing all costs and benefits to ratepayers. The CPUC's Policy and Planning Division issued a paper in May 2018 titled, "California Customer Choice: An Evaluation of Regulatory Framework Options for an Evolving Electricity Market." The paper raises awareness of the challenges and opportunities in

California's rapidly changing electricity market to advance a public dialogue among stakeholders, also raising the possibility of future legislative and/or regulatory action. In addition, the IRP process proposes to take a system wide view at the combined planning and procurement of IOUs, CCAs, and ESP providers, which should provide a roadmap to not only reach GHG goals, but also to achieve cost-effective procurement recommendations. The IRP proceeding and the RPS planning and procurement process should continue to work together to achieve California's GHG and renewable goals. The CPUC should also continue to closely monitor procurement activities of all the retail sellers to the extent possible.

Challenge 2: Rising Incidents of Curtailment

Issue: Curtailment occurs when there is an oversupply of generation or congestion on the electricity grid. The rise in California's solar generating capacity in recent years is one of the primary drivers of oversupply and as a result there are more incidents of resource being curtailed, especially in the spring months when hydroelectric resources are also plentiful.[69] Curtailment is considered a market-based solution for clearing the surplus electricity that is available on the grid. The benefits of economic curtailment include both avoided costs and cost savings. Day-ahead curtailments avoid costs of paying negative market prices, which require schedulers or generators to pay to generate. Real-time curtailments capture market opportunity costs and allow the dispatch of generators with economic bids to mitigate congestion.

Several years ago, the IOUs began to seek approval from the CPUC to amend existing contracts to add curtailment rights. The CPUC has approved these amendments to increase curtailment rights because of the potential for avoided costs and more recently, the Integrated Resource Planning (IRP) modeling has determined that curtailment is a cost-effective strategy for integrating more renewables on the grid.[70] Rather than investing in other integration options such as transmission upgrades or energy storage, initial modeling results indicate that buying additional solar and economically curtailing renewables in the limited hours of the year when they are not needed displaces natural gas generation and allows for higher renewable penetration.

While the CAISO has seen more pricing intervals with negative prices over the last several years, clearing prices are becoming less negative. In other words, the frequency of negative pricing events has increased, but the magnitude of oversupply has lessened. This indicates that the CAISO has generally been able to balance supply and demand using economic signals.

Recommendation: While curtailment does not appear to be an immediate barrier to achieving current RPS requirements, there is a need to fully understand ways to reduce its frequency and other renewable energy integration options as more renewables will be added to the system to meet the 60% RPS requirement. As a greater number of renewables are added to the grid in the future, curtailment may pose a risk to retail sellers' ability to meet their RPS obligations because the renewable resources might not generate

[69] For additional information on curtailment in California, see the California ISO's website: http://www.caiso.com/informed/Pages/ManagingOversupply.aspx and the ISO's Fast Fact sheet: https://www.caiso.com/documents/curtailmentfastfacts.pdf

[70] For additional information on curtailment in the IRP modeling, see (D.)18-02-018 and http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/IRP%20PD%20Fact%20Sheet_2018-01-29.pdf

as much RPS-eligible energy as originally forecasted. Retail sellers, primarily the IOUs, are preparing for this risk by modeling and forecasting expected renewable curtailment in the future and holding long RPS positions. In addition, the IOUs are including economic curtailment terms in executed or amended contracts in anticipation of increased need for curtailment options. The CPUC shall continue to examine the issue of the cost-effectiveness of curtailment in the IRP process and RPS proceeding in an effort to balance the increased procurement of renewables with the risk of over-supply and congestion.

Challenge 3: Meeting California's GHG Emissions Reductions Targets and Zero Carbon Goals

Issue: California has set ambitious climate goals and GHG emissions reduction targets. Governor Brown most recently signed SB 100, a landmark climate bill that calls for 60% RPS by 2030 and 100% zero-carbon energy by 2045. To meet these statutory goals, the IRP proceeding may determine that the state needs more renewables than the required RPS mandate to meet California's GHG emissions reduction targets and zero carbon goals. However, these additional renewables and zero carbon resources could potentially be non-RPS resources, such as large hydroelectric facilities. The RPS program will continue to be the policy driver for renewable procurement until retail sellers reach a 60% RPS, at which point more renewable and zero-carbon procurement, driven by the state's GHG goals and aggressive IRP planning, will occur.

Recommendation: The RPS planning and procurement process and the IRP proceeding and should continue to work together to achieve California's GHG and renewable goals. In determining whether there is a need for the procurement of additional renewable resources beyond 60% RPS, the state should defer to the CPUC's IRP process. The IRP modeling scenarios are designed to create the optimal statewide electricity portfolio to meet the GHG reduction targets and evaluate reliability needs of the overall electric system with respect to transmission limitations and renewable integration. Additionally, the IRP proceeding will be the primary avenue for identifying the additional procurement needed by retail sellers to meet the 100% zero-carbon mandate.

Challenge 4: Coordination Between IRP and RPS Planning and Procurement Activities

Issue: With the passage of SB 350 in 2015, the CPUC adopted a statewide electric sector GHG reduction target of 42 million metric tons (MMT) by 2030, which represents a 50 percent reduction in electric sector GHG emissions from 2015 levels and a 61 percent reduction from 1990 levels. To provide a general planning direction to the electric sector, the CPUC adopted a portfolio of energy resources to meet the 2030 GHG reduction target, which includes approximately 10,200 megawatts (MW) of new renewable energy resources and 2,000 MW of new battery storage resources by 2030.

Further, the CPUC was instructed to require the development and submittal of Integrated Resource Plans (IRPs) in addition to RPS Procurement Plans. These IRPs detail how each retail seller will meet their customers' resource needs, reduce GHGs, and ramp up the deployment of clean energy resources, including

at least 50% RPS. Therefore, the proceeding established to implement the IRPs must consider "resource needs" and "reducing GHGs" – considerations that overlap significantly with the RPS proceeding.

In addition, previously the RPS program was considered a compliance program and less of a procurement program to system needs. The IRP as an "umbrella" planning process changes this previous approach and how renewable planning and procurement is considered by the CPUC.

Recommendation: CPUC staff should continue to work closely with parties in both proceedings to coordinate the need determinations for additional renewable resource procurement, which includes answering critical questions about which proceeding will authorize and/or order new renewable procurement. The CPUC staff working on both the RPS program and IRP process continue to coordinate efforts to streamline administrative processes and make it less burdensome for parties to comply with the rules of each proceeding.

Challenge 5: Addressing California's Wildfire Crisis in the RPS Program

Issue: California experienced devastating wildfires in 2017 and 2018, leaving the state to grapple with issues ranging from wildfire prevention to legal liability of the utilities. Climate change has resulted in higher-than-normal temperatures and low humidity, conditions that could make year-round destructive wildfires the "new normal" in California. According to the U.S. Forestry Service and CALFIRE, at the end of 2017, the number of dead trees in California exceeded roughly 129 million on 9 million acres.[71] The large number of dead trees and high temperatures pose a serious risk to communities living in close proximity due to the high risk of wildfires, and the state needs to be fully prepared to address wildfires that occur with increasing intensity and frequency.

Recommendation: The CPUC has a variety of tools at its disposal for combatting wildfires, such as working with other agencies in the Forest Management Task Force (FMTF), collaborating with stakeholders, and addressing these issues in the RPS proceeding. The FMTF is made up of several government agencies such as CALFIRE, the U.S. Forestry Service, CalEPA, and the California Natural Resources Agency. The CPUC has staff from the RPS program that participate in the stakeholder collaboration on the FMTF.

With such a large number of dead and dying trees to manage, the inter-agency FMTF has collaborated on several fronts, including holding public workshops about reforestation, conducting public outreach and education on tree mortality and wildfire issues, and awarding over $21 million in grants aimed to remove dead trees and restore California forests.[72] The CPUC should continue to participate in interagency coordination and collaborative efforts with stakeholders to address issues related to wildfires and will be on

[71] See the U.S. Forest Service and CALFIRE's December 2017 news release for more information: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd566303.pdf

[72] For more information, see the U.S. Forest Service website on Tree Mortality in California: https://www.fs.fed.us/psw/topics/tree_mortality/california/index.shtml and the Tree Mortality and Drought Fact Sheet: https://www.fs.fed.us/psw/topics/tree_mortality/california/documents/DroughtFactSheet_R5_2017.pdf.

the front lines for strategic prevention, mitigation and regulatory consequences. In addition, the CPUC should continue to coordinate with CALFIRE to explore best practices and methodologies of wildfire mitigation.

With the passage of Senate Bill (SB) 901 (Dodd, 2018), which addresses California's wildfire crisis, each electrical corporation must submit an annual Wildfire Mitigation Plan (Plan) to an Independent Evaluator and the CPUC for review and approval. The CPUC must approve the Plan, consider the Independent Evaluator's findings, and assess penalties on the electrical corporations for non-compliance with the Plan. For the wildfires that occurred in 2017 and for future fires occurring after January 1, 2019, SB 901 requires the CPUC to determine if the cost recovery amounts requested by the IOUs related to the wildfires are just and reasonable. Further, the CPUC is authorized to allow the recovery of costs and expenses arising from catastrophic wildfires.

Additionally, SB 901 expands the eligible fuel stocks that may be used to meet the requirements of the existing BioRAM program and directs extended biomass procurement. The three large IOUs will be required to allow BioRAM facilities to report fuel stock usage on either a monthly basis or continue annual usage reporting. SB 901 allows for a five-year extension of existing BioRAM contracts, provided that the contracts are not in air basins that are in severe or extreme nonattainment of federal air quality standards for particulate matter and ozone and meet other criteria. The CPUC should also continue to monitor biomass procurement and its ability to address California's quantity of dead and dying trees. Finally, the CPUC should continue to review and consider changes to the BioMAT program regarding its ability to address California's fire risk.

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.[73] These facilities are permitted to sell RECs to California retail sellers[74] 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 Commission decisions to ensure that electricity retailers comply with CPUC rules and State law.[75]

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

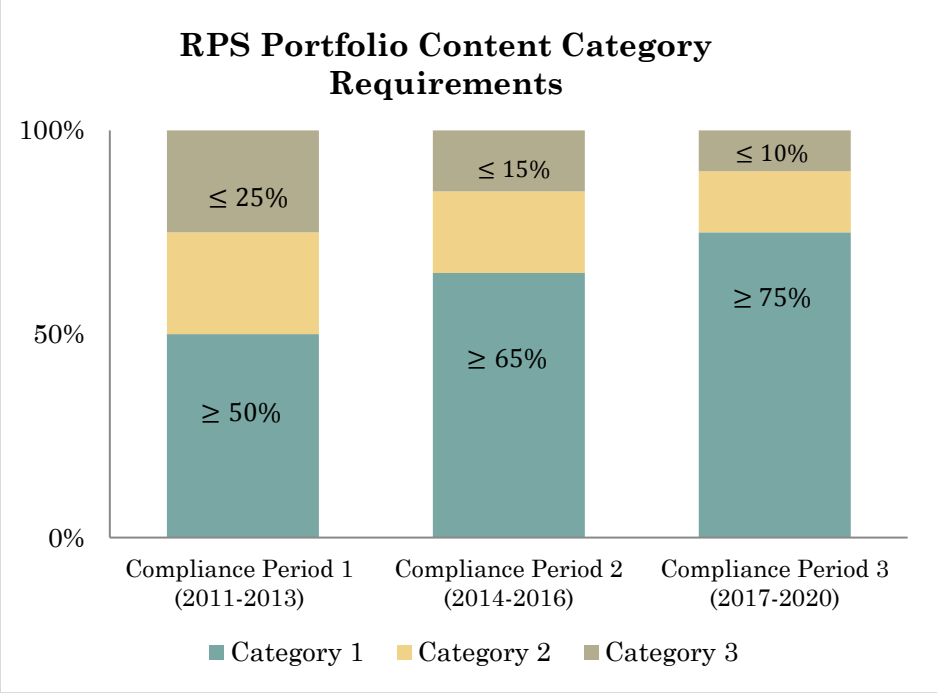
California's RPS program defines all renewable procurement acquired from contracts executed after June 1, 2010 into one of three portfolio content categories (PCCs). The PCC requirements are instrumental in determining a retail seller's compliance with the RPS program.

- **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.

[73] 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.
[74] 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 Section 218), community choice aggregators, and electric service providers.
[75] The CPUC Rulemaking for the RPS program is currently R.18-07-003.

- **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 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.[76] 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.

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

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

combination of the PCC classification of the RECs and whether the RECs are associated with short-term or long-term contracts.

The Commission 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.[77] 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).

[77] 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

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

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.

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.

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.

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

Integrated Resource Plan: A planning mechanism to consider all of the CPUC's electric procurement policies and programs to ensure California has a safe, reliable, and cost-effective electricity supply. It will implement 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.

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, San Diego Gas and Electric, and Southern California Edison comprise approximately three quarters of the retail electricity supply in California.[78]

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

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.

Renewable Auction Mechanism: An RPS procurement program the IOUs may use to procure RPS generation and to satisfy authorized procurement needs or legislative mandates. RAM streamlines the

[78] 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

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.

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.

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.

APPENDIX C: 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 Section 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 Section 399.15 and any recommendations for revisions of those cost limitations.

(d) Any renewable energy procurement plan approved by the commission pursuant to Section 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 Section 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 Section 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.