Standard LSE Plan

Sonoma Clean Power Authority

2020 INTEGRATED RESOURCE PLAN

Revised October 2, 2020

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I. Executive Summary

Sonoma Clean Power Authority (SCPA) is a government agency of the cities and counties of Sonoma and Mendocino, operating an electric Load Serving Entity (LSE) called Sonoma Clean Power (SCP) as a Community Choice Aggregator (CCA) under California Assembly Bill 117 (2002). SCPA is structured as a Joint Powers Authority and is governed by a Board of Directors comprised of elected officials from the counties, towns and cities of its service territory. SCPA began serving customers in May 2014 and today (as of 7/1/2020) serves approximately 227,600 accounts across Sonoma and Mendocino counties.

SCPA submits its Integrated Resource Plan filing to present the required 46 MMT Conforming Portfolio along with a Preferred Conforming Portfolio having emissions below SCPA's 38 MMT GHG emissions benchmark in compliance with California Public Utilities Commission (CPUC) Decision 20-03-028 and Cal. Pub. Util. Code § 454.52 (b) (3) A-C. With input from SCPA's Community Advisory Committee and with approval from its Board of Directors on August 6, 2020, SCPA makes this submission on September 1, 2020.

This plan describes how SCPA contributes to the CPUC statewide top-down plan needed to ensure California meets its Renewable Portfolio Standard (RPS), Greenhouse Gas (GHG) and Resource Adequacy (RA) goals. This plan will be used to procure resources in a manner that ensures SCPA's internal procurement goals – some of which exceed the State's goals – remain consistent with the CPUC's statewide plan. This plan represents the best of the top-down approach combined with more specific local data, such as improved forecasted load data as it relates to the number of customers served, climate, energy efficiency, distributed generation, electrification of vehicles and buildings, emerging industries, and more recently impacts of Public Safety Power Shutoffs, evacuations, and COVID-19 impacts.

SCPA has estimated the resources it will need to meet its assigned 2030 load and GHG Emissions benchmarks, published by the CPUC on April 15, 2020. Based on the Clean System Power (CSP) calculator, SCPA's GHG emissions in 2030 are calculated to be:

- 46 MMT Conforming Portfolio: 0.408 MMT for SCPA
- Preferred Conforming Portfolio: 0.250 MMT for SCPA (having emissions below the 38 MMT benchmark conforming portfolio, which is equivalent to 0.326 MMT for SCPA)

The estimated resources provided in SCPA's Portfolios are for CPUC planning purposes and do not represent a procurement commitment by SCPA.

As requested by the CPUC, SCPA's IRP includes 4 attachments as follows:

- Completed Resource Data Templates:
  - Attachment 1 (46 MMT portfolio): soma_rdt_46mmt_preferred_conforming_na_v2.xlsx
  - Attachment 2 (Preferred portfolio): soma_rdt_38mmt_preferred_conforming_na_v2.xlsx

- Completed Clean System Power calculators:
  - Attachment 3 (46 MMT portfolio): soma_csp_46mmt_preferred_conforming_na_v1.xlsx
  - Attachment 4 (Preferred portfolio): soma_csp_38mmt_preferred_conforming_na_v1.xlsx

II. Study Design

a. Objectives

The objective of SCPA's IRP is to inform system resource planning by sharing SCPA's 46 MMT Conforming Portfolio and SCPA's 38 MMT Preferred Conforming Portfolio through 2030.

SCPA's IRP demonstrates that SCPA has a resource plan to meet its assigned load forecast through 2030. SCPA provides the following portfolios:

- 46 MMT Conforming Portfolio which meets the 2030 GHG benchmark set for SCPA. This Portfolio is submitted in compliance with D.20-03-028.

- Preferred Conforming Portfolio which provides lower emissions than the 38 MMT Portfolio 2030 GHG Emissions benchmark set for SCPA. This portfolio was approved by SCPA's Board on August 6, 2020. SCPA's Board approved its Preferred Conforming Portfolio for procurement because it meets or exceeds all of the 38 MMT and 46 MMT conforming portfolio objectives, including the GHG and reliability objectives, while also meeting all of SCPA's internal goals.

Load Assignment for SCPA

SCPA uses the load forecast established by Rulemaking 16-02-007 Finalizing Load Forecasts and GHG Benchmarks for Individual LSEs filed April 15, 2020 (shown in Table 1). SCPA did provide custom hourly shapes for baseline load and Behind-The-Meter Photovoltaics (BTM PV) that are described in the Methodology section below.

Table 1- Managed Retail Sales Forecast

	2020	2022	2026	2030
Managed Retail Sales (GWh) Forecast assigned to SCPA	2,377	2,312	2,307	2,309

GHG Emissions Benchmark

As ordered in D.20-03-028, SCPA must prepare a conforming portfolio addressing their proportional share of the 46 MMT 2030 GHG emissions target, when calculated using the CSP calculator. In addition, SCPA must prepare a conforming portfolio to meet or beat their proportional share of a 38 MMT 2030 GHG target. Adopted respective GHG Benchmarks for SCPA's proportional shares filed April 15, 2020 are shown below in Table 2.

Table 2 CPUC Emissions Benchmarks for SCPA

	2030 GHG Emissions (MMT)	2030 GHG Emissions in CSP Calculator (MMT net of BTM CHP Emissions) *
CPUC Benchmark for SCPA, 46 MMT	0.472	0.408
CPUC Benchmark for SCPA, 38 MMT	0.390	0.326
SCPA's Preferred Portfolio	0.314	0.250

*** Applies LSE-specific benchmarks provided by CPUC to account for 5.5 MMT of BTM CHP emissions.**

b. Methodology

i. Modeling Tool(s)

SCPA used the CPUC's common inputs, assumptions, and modeling methodologies to develop the 46 MMT Conforming Portfolio and the Preferred Conforming Portfolio. These include but are not limited to the CSP Calculator, SCPA's assigned annual energy volumes for load and load modifiers. For the Preferred Conforming Portfolio, SCPA used in-house tools to select resources to meet Board approved GHG requirements which exceed state requirements, and then utilized the CSP Calculator with all conforming inputs and assumptions to validate conforming GHG emissions.

ii. Modeling Approach

To produce both conforming portfolios, SCPA used the templates provided by the CPUC. Although these templates use the annual energy volumes for load and load modifiers, SCPA did input custom shapes for baseline load, BTM PV, and GHG-free supply that SCPA anticipates procuring from specified physical resources. This approach is consistent with the requirements for conforming portfolios.

The custom baseline load shape is derived from the output of an internal regression model trained on historic meter counts, Net Energy Metering (NEM) solar installations, and weather data. Forecast meter counts reflect results from a COVID-19 economics study completed by Dr. Robert Eyler and Dr. Jon Haveman in Spring 2020[1]. SCPA anticipates COVID-19 to impact energy use going forward and thus engaged two local economists to advise on macroeconomic forecasts and the relation to SCPA specific customer trends. For weather, SCPA entered historic 2007 data to align with the CPUC's modeling for the Reference System Portfolio (RSP). SCPA's model was then adjusted for statewide trends in Electric Vehicle (EV) usage, energy efficiency, and NEM solar growth using the load modifiers provided in the CSP Calculator. SCPA adopted the CSP annual energy volume for NEM solar growth but customized the hourly profile based on the SCPA NEM model with 2007 weather. SCPA directly used the forecast resulting from this process to internally evaluate resources for the Preferred Conforming Portfolio. For the CSP, SCPA took the additional step of normalizing the forecast to SCPA's assigned load and representing the factors discussed above as a custom shape.

SCPA developed the hourly GHG-free resource profile using historic data for resource specific contracted solar and wind resources. SCPA used the default CSP profiles for generic resources where the location and specific delivery profiles are unknown. Generic resource profiles will be replaced with resource specific profiles in subsequent IRP cycles as specific resources are identified. Geothermal is represented as a baseload resource (flat 24x7 profile). For short and long duration storage, SCPA developed charge and discharge profiles that minimize the hourly net open position for a given month and typical weekday or weekend.

SCPA understands that the Investor Owned Utilities (IOUs) are to report their excess RPS and carbon free generating resources, resources that SCPA customers pay for in their PCIA fee, in their baseline portfolios. This has the effect of causing IOU portfolios to significantly overstate their use of renewable and carbon free energy. SCPA includes estimates of PCIA resource allocations within its internal resources planning. The above market costs of these resources are paid for by IOU and departed load LSE customers, including through PCIA charges to CCA customers, yet the GHG attributes are only applied to the IOUs unless the IOUs offer an allocation to other LSEs. SCPA has already accepted PCIA allocations for hydro and denied nuclear allocations for 2020. SCPA plans for ongoing carbon free hydro allocations as well as RPS allocations starting in 2023 for existing solar, wind, geothermal, biomass, and small hydro for SCP's fair share of PG&E's legacy portfolio. The CPUC has not yet ruled on whether these resources will be allocated in the future, however SCPA assumes that if they are not allocated, there will be existing RPS and carbon free resources available to the market given that the IOUs will need fewer resources to serve their remaining customer load. In conclusion, SCPA will internally plan for existing baseline resources that will be available for market procurement based on estimates of SCPA's load share of PG&E PCIA eligible resources. If incremental buildout of GHG-free resources is required for individual LSEs to meet their own GHG targets

[1] This study can be found on SCPA's website: https://sonomacleanpower.org/uploads/documents/Economist-SCP-COVID-Forecast-Final-May-08-2020.pdf

when there are sufficient baseline resources to meet these targets, costs for unnecessary over-procurement will be placed on California electricity customers.

To satisfy the CPUC's requirement to submit a conforming 46 MMT portfolio, SCPA contrived resources resulting in a CSP GHG calculation that exactly matched the SCPA benchmark. The methodology for developing the portfolio used the following logic:

1. Account for resources already under contract
2. Utilize existing resources that will likely be allocated to SCPA or offered to the market that are no longer used and useful for PG&E's customer load. These resources are estimated using SCPA's load share of PG&E PCIA eligible resources.
3. Utilize RSP share (as shown in Total RSP Total Resource Mix) of existing geothermal
4. Match the RSP share of New Resource Buildout long-duration storage
5. Match the remainder of 60% RPS position with New Resource Buildout solar PV
6. Utilize New Resource Buildout short-duration storage not to exceed 80% of the new Resource Buildout solar PV capacity
7. Utilize no more than RSP share of existing import hydro (as shown in Total RSP Total Resource Mix) to get to exact 46 MMT GHG benchmark

SCPA employed a much more detailed process in developing the Preferred Conforming portfolio that exceeds the 38 MMT benchmark. Candidate portfolios were selected using the following metrics: GHG emissions, RPS compliance, load shape alignment, potential curtailment, estimated cost, reliability, alignment with the RSP, and utilization of local resources. All candidate portfolios retained resources already under contract and were required to meet SCPA's Board approved GHG target of 75 lbs CO_2/MWh emissions while meeting or surpassing the statewide requirement of 60% RPS by 2030. Note that SCPA's Board-approved GHG requirement is based on an annual netting calculation methodology established by The Climate Registry because, until the full implementation of AB 1110, that remains the only standard IOUs use to communicate greenhouse gas emissions for retail sales to customers, and SCPA wished to use that same standard. The Climate Registry methodology does not align with the new GHG calculation methodology in the CSP, however, so SCPA went through the exercise to verify compliance with both standards. The 46 MMT Conforming Portfolio estimated emissions using The Climate Registry annual methodology is 246 lb CO_2/MWh, thus does not meet SCPA's Board-approved 75 lb CO_2/MWh target.

c. Review of Resource Plan with Respect to August 2020 Outages

From August 13 through at least August 21, 2020, tropical storm Fausto and then Hurricane Genevieve created hot and humid weather across much of the Western United States. A combination of factors caused high demand and below-average generating supply during the Net Peak, following the System Peak, ultimately causing the CAISO to call the first Stage 2 alert

since 2006 and then a Stage 3 alert and requiring outages on Friday August 14, 2020. Those factors included:

- Extremely hot and humid weather created high air conditioning load.
- An increase in residential evening load due to COVID-19, with more people working and going to school at home, and with the closure of indoor restaurants, movie theaters, etc.
- Hot conditions may have reduced output from thermal units.
- Over 1,100 MW of natural gas capacity tripped offline, perhaps due to ramping more quickly than designed. Regulators are still investigating.
- Rapid fluctuations of about 1,000 MW in wind power output due to the storm.
- Lack of ability for CAISO to procure a typical amount of imports due to above-normal loads in Oregon, Washington and Nevada due to the storm.
- A lack of sufficient 4- and 8-hour storage on the system to reduce the slope of the evening ramp may have contributed to two thermal units tripping offline from ramping too quickly, losing over 1,100 MW of capacity in a short period.
- Demand response capabilities in the CAISO system were small (less than 1,000 MW) due to California's historic focus of such programs on commercial loads, which are naturally low after 6PM on Friday, and generally in the evening Net Peak hours.

Due to the extreme weather and fires SCPA and California have experienced every year since 2017, and climate forecasts made by UCLA and Cal-Adapt, SCPA draws the conclusion that preparing for future monsoon conditions is prudent and uses August 2020 as a planning benchmark. From this lens, SCPA plans for the following:

- SCPA's Preferred Portfolio includes significantly more 8-hour storage than expected in the Reference System Plan to extend the time thermal units have to ramp up, to provide protection against thermal unit failure during the ramp, and to help fill the evening Net Peak period.
- SCPA's existing demand response program strongly focuses on residential evening loads and utilizes automated dispatch to increase flexibility. SCPA was able to dispatch GridSavvy on August 14, 17 and 18 to help reduce risks of outages. This program will be expanded each year through 2030, however out of an abundance of caution the GridSavvy load flexibility is not reflected in this IRP but may be included in future IRPs as the program obtains more metered performance data.
- SCPA's Preferred Portfolio contains significantly more baseload renewable geothermal energy than the Reference System Plan to help ensure clean power resources are part of the solution to the Net Peak during monsoon weather.
- As always, SCPA will only use import capacity to fill RA requirements when it is firm, and includes transmission rights to deliver energy, if called upon.

- SCPA plans to continue its August 2020 practice of amplifying Flex Alert messages by using all available social media to reach customers.

III. Study Results

a. Conforming and Alternative Portfolios

SCPA is submitting two conforming portfolios, one portfolio that addresses SCPA's share of the 46 MMT portfolio and one Preferred Conforming Portfolio that is based on SCPA's Board adopted 2030 GHG targets. The 46 MMT Conforming Portfolio does not meet SCPA Board approved GHG targets or resource mix and is not used for any SCPA planning purposes. SCPA will not structure procurement around the 46 MMT Conforming Portfolio and it is provided here in compliance with D.20-03-028 for information only.

SCPA's conforming portfolios consist of the resources listed in the corresponding Resource Data Templates (Attachments 1 and 2). As a summary, Table 3 shows the resources contrived to generate the 46 MMT benchmark and the Preferred Conforming Portfolio planned resources for energy (RA-only contracts are excluded) identified for each portfolio.

SCPA highlights the Sand Hill C Wind project listed in Table 3. This is an existing, approved contract for incremental wind capacity. However, the developer is experiencing significant challenges as the result of threatened litigation and an appeal of the local environment permits. SCPA does not expect Sand Hill C to be delivering in current form by the COD date in the contract and reports this on the Resource Data Templates. SCPA includes Sand Hill C Wind in Table 3 and as part of both portfolios because the contract is still effective and binding, no default or termination clause conditions have been met, and the project still has the possibility of being built. SCPA expects to replace the 2021 deliveries with similar resources and potentially ultimately contract for the development of a new resource at a different site if the contract is terminated due to the challenges with Sand Hill C's original location. SCPA does not rely on Sand Hill C for the ordered incremental procurement required under Milestone #1 reported in the Action Plan section of this filing. Throughout this filing, SCPA will include the capacity and generation from Sand Hill C in aggregated portfolio figures in expectation of contracting with replacement resources with similar renewable energy generation. When Sand Hill C is presented as an individual project, SCPA lists an asterisk next to Sand Hill C.

Table 3- 46 MMT Conforming Portfolio and SCPA Preferred Conforming Portfolio

	Resource Type	46 MMT Conforming Portfolio (for information only)	SCPA Preferred Conforming Portfolio
Existing Resources, existing contracts			
Geysers (through 2026 only)	Geothermal	50 MW	50 MW
Mustang Solar	Solar PV	70 MW	70 MW
Golden Hills Wind	Wind	46 MW	46 MW
Lavio Solar	Solar PV	1 MW	1 MW
Stage Gulch Solar	Solar PV	1 MW	1 MW
Cloverdale Solar	Solar PV	1 MW	1 MW
IP Malbec Solar	Solar PV	1 MW	1 MW
New resources in development and under contract			
Bodega Energy West Solar (COD Dec 2020)	Solar PV	1 MW	1 MW
Petaluma Energy East Solar (COD Sep 2020)	Solar PV	1 MW	1 MW
*Sand Hill C Wind or replacement (COD possible Jan 2021) **	*Wind*	*80 MW*	*80 MW*
Proxima Solar (COD Jul 2023)	Solar PV	50 MW	50 MW
Proxima Battery Storage (COD Jul 2023)	Battery Storage	5MW/20MWh	5MW/20MWh
Mustang Battery RA (COD Aug 2021)	Battery Storage	35MW	35MW
Existing resources, future contracts for 2030 portfolio			
Generic Geothermal resource	Geothermal	20 MW	30 MW
Generic Biomass	Biomass	0 MW	3 MW
Market Geothermal	Geothermal	1 MW	1 MW
Market Solar	Solar PV	124 MW	124 MW
Market Wind	Wind	24 MW	24 MW
Market Biofuels	Biofuels	4 MW	4 MW
Market in-State RPS hydro	RPS hydro	3MW	3 MW
Market In-State Carbon Free	Large Hydro	99 MW	99 MW
Import Hydro	Large Hydro	12 MW	32 MW
Long Duration Storage	Long duration storage	0 MW	30 MW
New Resources, future investment for 2030 portfolio			
Generic Biomass	Biomass	0 MW	5 MW
Solar PV	Solar PV	17 MW	91 MW
Generic battery storage	Battery Storage	15 MW	44 MW
Long Duration Storage	Long duration storage	10 MW	20 MW

*See discussion of Sand Hill C in “Study Results”.

Resource Adequacy (RA)-Only

SCPA makes all commercially reasonable efforts to fully comply with all RA requirements, and SCPA will continue its practice of procuring long-term, multi-year, year-ahead and month-ahead RA.

SCPA currently has numerous RA-only contracts that it uses to supplement the long-term RA provided by its RPS and battery storage contracts to comply with California's Resource Adequacy (RA) program. The RA program requires LSEs to demonstrate specific quantities of system, local and flexible capacity in the year-ahead and month-ahead time frames, though the specific requirements for local capacity in years 2023 through 2030 are modified by the CPUC's recent decision D.20-06-002 to direct PG&E to act as a Central Procurement Entity (CPE) for local RA. SCPA has listed its current RA-only contracts (as of 7/1/2020) in the Resource Data Template and has listed generic RA-only contracts for future estimated RA obligations. SCPA has included local RA resources under the CPE as well as planned system resources as generic RA-only contracts.

To fully characterize the SCPA's RA position relative to system reliability requirements, SCPA also included anticipated Cost Allocation Mechanism (CAM) RA and CAM Demand Response (DR) RA in the resource data template. SCPA highlights that SCPA's load share of incremental battery storage resources within these CAM resources is estimated at 16 MW. SCPA will pay for these resources but not receive the credit as new resource buildout toward SCPA's share of the RSP.

SCPA used the 2020 Year Ahead Final CAM list with Allocation Effective and End dates for PG&E posted on the CPUC's website and the most recent Net Qualifying Capacity (NQC) list to establish an estimate of CAM resources for the future. SCPA used the 2021-2023 PG&E Demand Response Totals posted on the CPUC website to establish an estimate of DR resources in the future, carrying the 2023 totals through 2030. SCPA used its proportional share of the 2021 coincident peak load by month for PG&E service territory to establish it proportional share of these estimated CAM and DR resources.

SCPA forecasted its future RA obligation beyond 2021 by scaling its initial 2021 monthly year ahead allocation by its share of the annual system peak calculated in the resource data template and adding a 15% planning reserve margin. The monthly obligation was then compared to the net RA position resulting from existing and planned procurement and used to calibrate the size of the generic RA-only contracts included in the template. SCPA anticipates a variety of resources, including both renewable, storage, and natural gas units, will provide the capacity in these RA-only contracts.

New Resources Comparison to RSP

SCPA uses the SCPA load share of CAISO load to determine the SCPA share of the New Resource Buildout of the 46 MMT RSP (Tables 5 CPUC Decision 20-03-028) and the 38 MMT RSP (Tables 8

CPUC Decision 20-03-028). Note SCPA also utilizes the Total Resource Mix of the 46 MMT RSP and the 38 MMT RSP when establishing the conforming portfolios. SCPA's load share of CAISO load is shown in Table 4.

Table 4- SCPA Load Share of CAISO LOAD

SCPA LOAD SHARE OF CAISO LOAD						
2020	**2021**	**2022**	**2023**	**2024**	**2026**	**2030**
1.15%	1.15%	1.13%	1.13%	1.13%	1.12%	1.12%

46 MMT Conforming Portfolio

Table 5 shows the 46 MMT RSP New Resources Buildout compared to the 46 MMT Conforming Portfolio contrived resources established from the methodology previously discussed. Note that the differences between the RSP and the 46 MMT Conforming Portfolio new resources are a result of having to utilize existing contracts, prevent over-procurement, meet the 60% RPS by 2030 requirement, and exactly match SCPA's CSP GHG benchmark for the 46 MMT Conforming Portfolio. This portfolio is submitted in compliance with D. 20-03-028 and as noted above was not approved by SCPA's Board and does not meet SCPA Board approved GHG targets.

Table 5- 46 MMT RSP new resources compared to 46 MMT Conforming Portfolio

46 MMT New Resources Buildout Load Share (Cumulative MW) based on CPUC Decision 20-03-028 Table 5							
Resource Type	**2020**	**2021**	**2022**	**2023**	**2024**	**2026**	**2030**
Wind	0	0.4	22.1	22.1	30.9	30.8	31.7
Wind on New Out-of-State Transmission	0	0	0	0	0	0	6.8
Utility-Scale Solar	23.1	46.1	68	90.5	90.4	90	122.9
Battery Storage	1.8	28.3	27.8	27.8	37.3	68.9	99
Pumped (long-duration) Storage	0	0	0	0	0	10.9	10.9
Shed Demand Response	0	2.6	2.5	2.5	2.5	2.5	2.5
Natural Gas Capacity Not Retained	0	0	0	0	0	0	-0.3
SCPA 46 MMT Conforming Portfolio New Resources (Cumulative MW)							
*Wind**	*0*	*80*	*80*	*80*	*80*	*80*	*80*
Wind on New Out-of-State Transmission	0	0	0	0	0	0	0
Utility-Scale Solar	2	2	2	52	52	56	69
Battery Storage	0	35	35	40	40	40	55
Pumped (long-duration) Storage	0	0	0	0	0	10	10
Shed Demand Response *	0	0	0	0	0	0	0
Natural Gas Capacity Not Retained	0	0	0	0	0	0	0

*See discussion of Sand Hill C in "Study Results".

SCPA Preferred Conforming Portfolio

Table 6 shows the 38 MMT RSP New Resources Buildout compared to SCPA's Preferred Conforming Portfolio. This portfolio was approved by SCPA's Board on August 6, 2020.

Table 6- 38 MMT RSP new resources compared to SCPA Preferred Conforming Portfolio

38 MMT New Resources Buildout Load Share (Cumulative MW) based on CPUC Decision 20-03-028 Table 8							
Resource Type	**2020**	**2021**	**2022**	**2023**	**2024**	**2026**	**2030**
Wind	0	0.4	33.1	33.1	43.1	42.9	58.9
Wind on New Out-of-State Transmission	0	0	0	0	0	0	33.5
Utility-Scale Solar	23.1	46.1	68	90.5	90.4	97.7	133.8
Battery Storage	1.8	28.3	27.8	27.8	35.1	56.6	108.4
Pumped (long-duration) Storage	0	0	0	0	0	18.1	17.9
Shed Demand Response	0	2.6	2.5	2.5	2.5	2.5	2.5
Natural Gas Capacity Not Retained	0	0	0	0	0	0	-22.8
SCPA Preferred Conforming Portfolio Planned New Resources (Cumulative MW)							
*Wind***	*0*	*80*	*80*	*80*	*80*	*80*	*80*
Wind on New Out-of-State Transmission	0	0	0	0	0	0	0
Utility-Scale Solar	2	2	2	52	52	56	143
Battery Storage	0	35	35	40	40	40	84
Pumped (long-duration) Storage	0	0	0	0	0	20	20
Shed Demand Response*	0	0	0	0	0	0	0
Natural Gas Capacity Not Retained	0	0	0	0	0	0	0
Biomass	0	0	0	0	0	0	5

***** note- SCPA's demand respond program (GridSavvy) is utilized to decrease monthly peak MW in load demand and does not currently plan to utilize CAISO markets to bid in as supply.

**See discussion of Sand Hill C in "Study Results".

SCPA's load share of the 38 MMT RSP for new renewable resources buildout is 226 MW. SCPA's Preferred Conforming Portfolio consists of 228 MW which is greater than the RSP. In addition, SCPA determined the mix of new resources in conjunction with existing contracts and the Total Resource Mix of the 38 MMT RSP for existing resources to closely match SCPA's hourly load profile.

SCPA's load share of the 38 MMT RSP for new short-duration storage resources buildout is 108 MW. SCPA's Preferred Conforming Portfolio consists of 84 MW. Short-duration storage was considered in conjunction with new solar PV resources buildout to most effectively utilize solar PV charging as well as in conjunction with long-duration storage to closely match SCPA's hourly load profile.

SCPA's load share of the 38 MMT RSP for new long-duration storage resources buildout is 18 MW. SCPA's Preferred Conforming Portfolio consists of 20 MW. SPCA's Preferred Conforming Portfolio total resources mix includes 50 MW total (20 MW new + 30 MW existing) whereas

SCPA's load share of the 38 MMT Total Resource Mix RSP is 36 MW. SCPA selected to utilize more long-duration storage to supplement the short-duration storage shortfall of the RSP as these resources allow SCPA to align resources with load more effectively. SCPA plans for at least 20 MW of new long-duration storage but will explore additional new resources if existing resources are not available to the market or if there is a cost-effective opportunity to buildout above the 20 MW in SCPA's Preferred Portfolio.

b. Preferred Conforming Portfolios

SCPA Preferred Conforming Portfolio

SCPA's Preferred Conforming Portfolio is approved by SCPA's Board and has emissions below the 38 MMT benchmark conforming portfolio.

In addition to Table 3 presented previously, Table 7 shows SCPA's existing and needed procurement to accomplish the Preferred Conforming Portfolio 2030 Resource Mix.

Table 7- 2030 SCPA Preferred Conforming Portfolio

Technology	Existing Contracts for 2030	Additional Procurement for 2030
Solar	Mustang (online) – 70 MW ProFIT – 6 MW Proxima (2023) – 50 MW	New Solar – 91 MW Market Existing Solar – 307 GWh
Wind	Golden Hills (online) – 46 MW *Sand Hill C (2021) – 80 MW**	Market Existing Wind – 59 GWh
Storage	Proxima (2023) – 5 MW 4-hr Mustang Battery RA (2021)- 35 MW	New 4-hr – 44 MW Long Duration (8-12 hr)– 50 MW (at least 20 MW is newly constructed storage capacity)
Geothermal	*Existing 50 MW geothermal contract expires at the end of 2026*	Existing Geothermal Resource – 30 MW Market Existing Geothermal – 9 GWh Geothermal
Biomass		New Biomass – 5 MW Existing Biomass – 3 MW Market Existing Biomass – 24 GWh
Hydro		Import Hydro – 122 GWh Market Existing Large Hydro – 267 GWh Market Existing RPS Hydro – 9 GWh

*See discussion of Sand Hill C in "Study Results".

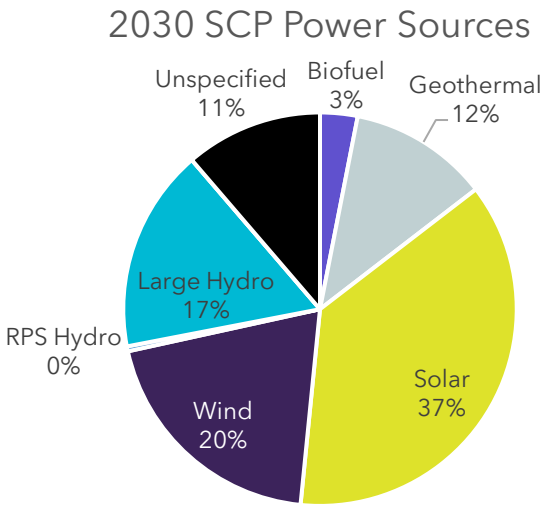
Table 8 shows the cumulative total resource mix for SPCA's Preferred Conforming Portfolio for 2022, 2026, and 2030 compared to the 38 MMT RSP. The Total Resource Mix includes all resources from the new resource buildout shown in Table 6 and resources from existing generation. SCPA used the CSP capacity factor for each respective Market Existing Resource GWh shown in Table 7 to determine the effective MW to compare against the RSP in Table 8.

Table 8- SCPA Preferred Conforming Portfolio Total Resource Mix compared to 38 MMT RSP

	2022		2026		2030	
Resource Type	**38MMT RSP**	**Preferred Portfolio**	**38MMT RSP**	**Preferred Portfolio**	**38MMT RSP**	**Preferred Portfolio**
Wind	117.6	126	126.7	155	142.1	150
Utility-Scale Solar	236.6	249	265.1	257	299.9	341
Battery (4-hr) Storage	53.4	35	89.7	40	144.8	84
Long-duration (8-12 hr) Storage	18.1	0	36.0	50	35.7	50
Biomass	10.4	0	10.2	5	10.1	12
Wind on New Out-of-State Transmission	0	0	0	0	33.5	0
Shed Demand Response	27.4	* note	27.2	* note	27.0	* note
Hydro (Large)	80.1	118	79.5	99	78.9	99
Hydro (Scheduled imports)	32.3	32	32.1	25	31.8	32
Geothermal	21.0	50	20.8	51	20.7	31
Hydro (Small)	11.0	0	11.0	3	10.9	3
Nuclear	33.3	0	7.1	0	7.1	0
Natural Gas	284.5	0	282.4	0	279.9	0
Coal	5.4	0	0	0	0	0

Figure 1 shows SCPA's Preferred Conforming Portfolio 2030 power resource mix by MWh energy generated. Note that while Figure 1 shows the power resources mix using the load assigned to SCPA in the CSP Calculator for 2030, SCPA's 2030 internal updated load is reduced due to forecast COVID impacts. For internal planning using SCPA's most up to date 2030 load forecast, unspecified power is only 7%.

Figure 1- Preferred Conforming Portfolio 2030 Resource Mix



SCPA chose the Preferred Conforming Portfolio after assessing multiple scenarios as previously discussed in the Methodology section. The Preferred Conforming Portfolio was not the apparent least-cost portfolio SCPA modelled. It should be noted that the apparent least-cost portfolio scenario relied heavily on solar photovoltaic (PV) and import hydro with very limited short-duration (4-hr) storage and no long-duration (8-12-hr) storage. As such, it did not closely match SCPA's load curve nor align with the 38 MMT RSP. SCPA believes that while this was the apparent least-cost portfolio, the risks associated with selecting this portfolio would be too great for several reasons. First, the risk of curtailment of solar is increasing. Second, the risk of increased capacity costs for non-solar hours is high. Third, large quantities of import hydro may not be available or may come with additional CPUC constraints that diminish its viability. Fourth, this potentially increases the risk that further resources would be necessary, leading to ordered procurement by the CPUC and the costs associated with that. In addition, any portfolio scenario analyzed that did not heavily consider the 38 MMT RSP, was believed to incur the same risk. As such, SCPA's recommended Preferred Portfolio closely matches the shape of SCPA's load while also using resources identified as available in the 38 MMT RSP (both new resources buildout and total resource mix) in a cost-conscious manner. SCPA believes the Preferred Conforming Portfolio to be the least-cost risk-adjusted portfolio.

SCPA's Preferred Conforming Portfolio relies on long-duration storage more than the SCPA's load share of the 38 MMT RSP for Total Resource Mix. The increased long-duration storage provides greater support for grid reliability, and also will be used to more than make up for slightly less short-duration storage. SCPA chose to do this as a result of direction from the CAISO on future reliability needs, CPUC identified renewable integration resources, and in response to the steepness of the evening ramp and potential loss of needed resources during high demand periods in summer months, which may have contributed to the August 2020

CAISO-ordered outages. SCPA also determined that long-duration storage enables SCPA's resource profile to more closely align with SCPA's load profile.

SCPA also places large importance on local resources and baseload power. SCPA has committed to providing local renewable power day and night for the SCPA EverGreen (100% local renewable power) customers. As such, SCPA chose to rely on geothermal power more than SCPA's 38 MMT RSP load share. SCPA also has been working with biomass developers to explore using woody debris in Sonoma County from tree trimming and forest thinning operations for use in new buildout local renewable resource projects. If developed, this could also help with long-term wildfire risk and vegetation management.

SCPA highlights that the 2030 Preferred Conforming Portfolio resource mix has evolved from the portfolio SCPA submitted to the CPUC in 2018. The key differences are as follows:

- *Solar-* SCPA increased the planned solar PV procurement from 146 MW to 217 MW. Solar PV is often the most cost-effective renewable energy resource. SCPA also plans for market purchases of existing solar PV comparable to the estimated SCPA share of PG&E PCIA allocations for solar PV (124 MW). The increased solar is paired with plans for short- and long-duration storage to address reliability and load-shaping concerns.

- *Storage-* SCPA increased the planned 4-hr battery storage from 5 MW to 84 MW. SCPA also increased the planned long- duration storage from 0 to 50 MW. SCPA believes that planning for 50 MW of long-duration storage will address reliability and load-shaping concerns of incremental renewable integration within SCPA's portfolio. SCPA participated in a joint Request for Information (RFI) on long-duration storage in June 2020. There were 31 responses to the RFI and SCPA is currently reviewing all responses and is participating in a joint RFO to be issued in September 2020.

- *Wind-* SCPA has no changes to planned 126 MW wind procurement, however SCPA plans for market purchases of existing wind resources comparable to the estimated SCPA share of PG&E PCIA allocations for wind (24 MW). Sand Hill C wind, an 80 MW project, is unlikely to be completed under the terms of the existing contract due to permitting delays, although SCPA seeks to replace it with a similar resource. See discussion in "Study Results".

- *Geothermal-* SCPA reduced the planned geothermal procurement from 50 MW to 30 MW. This still significantly exceeds SCPA's portion of geothermal in the RSP, however reduces costs from the 2018 portfolio. Geothermal is one of the most expensive renewable energy sources in SCPA's current portfolio. SCPA also plans for market purchases of existing geothermal resources comparable to the estimated SCPA share of PG&E PCIA allocations for geothermal (1 MW).

- *Biomass-* SCPA increased the planned biomass procurement from 0 MW to 8 MW. SCPA is currently working with biomass developers to explore using woody debris in Sonoma County from tree trimming and forest thinning operations. If developed, this could also help with long-term wildfire risk and vegetation management. SCPA also plans for market purchases of existing biomass resources comparable to the estimated SCPA share of PG&E PCIA allocations for biomass (4 MW).

- *Hydro-* SCPA decreased reliance on imported carbon free hydropower as a result of the RSP identified market availability. SCPA targets procuring only SCPA's load share allotment of the 38 MMT RSP for import hydro. SCPA also plans for market purchases of existing in-state hydro resources comparable to the estimated SCPA share of PG&E PCIA allocations for in-state hydro (103 MW).

SCPA's Preferred Conforming Portfolio utilizes short-duration and long-duration storage to store excess energy generation during solar hours and discharge that energy during ramping and non-solar hours, as well as utilizes geothermal, biomass, wind and demand-side resources. The remaining load is served with market system energy (largely consisting of natural gas). Since the 46MMT and 38 MMT RSPs do not differ markedly with respect to the amount of retained natural gas, this basic dynamic would likely not change whether or not other LSEs procure additional renewables to meet their load. SCPA's Preferred Conforming Portfolio contributes more toward reliability than the 46 MMT Conforming Portfolio by utilizing more baseload geothermal and biomass resources as well as more short-duration and long-duration storage resources that are discharged during ramping periods. If other LSEs procure with higher degrees of renewable penetration, in particular solar, market prices are likely to become more depressed during solar hours, thus making the economic case for further storage more attractive, and in turn making lower GHG portfolios more reliable. Though the current system RA construct anticipates declining ELCCs with increased solar and storage, this construct does not capture the hourly operation of these resources and their flexible and responsive contribution to reliability.

c. GHG Emissions Results

2030 GHG Results

Table 9 shows SCPA's estimated 2030 GHG emissions, when calculated using the Clean System Power Calculator for both the 46 MMT Conforming Portfolio and SCPA's Preferred Conforming Portfolio. Completed CSP Calculators are provided in Attachments 3 and 4.

Table 9- 2030 GHG Emissions (from CSP Calculator)

	2030 GHG Emissions (MMT)
SCPA 46 MMT Conforming Portfolio	0.408
SCPA Preferred Conforming Portfolio	0.250

SCPA used a customer hourly load shape and resource specific hourly generation shapes within the Clean System Power Calculator to obtain the emissions results. The basis of these shapes is discussed in the Modeling Approach section.

d. Local Air Pollutant Minimization and Disadvantaged Communities

i. Local Air Pollutants

Table 10 shows the PM2.5, and SO2, and NOx emissions results from the CSP Calculator for the 46MMT Portfolio.

Table 10- 46 MMT Conforming Portfolio Local Air Pollutants (from CSP Calculator)

kg/MWh	2020	2022	2026	2030
PM2.5	0.0020	0.0049	0.0103	0.0122
SO2	0.0002	0.0005	0.0026	0.0024
NOx	0.0067	0.0102	0.0257	0.0266

Table 11 shows the PM2.5, and SO_2, and NO_x emissions results from the CSP Calculator for the SCPA's Preferred Conforming Portfolio.

Table 11- Preferred Conforming Portfolio Local Air Pollutants (from CSP Calculator)

kg/MWh	2020	2022	2026	2030
PM2.5	0.0020	0.0049	0.0103	0.0092
SO2	0.0002	0.0005	0.0026	0.0021
NOx	0.0067	0.0102	0.0257	0.0218

SCPA's contribution to air pollutants result from CHP, biomass, and reliance on system power. See Section III Action Plan for SCPA's plan to reduce reliance on system power. SCPA has no control over the amount of CHP that is assigned to SCPA by the CPUC.

Additionally, SCPA is convening local cities, first responders, Bay Area Air Quality Management District and Northern Sonoma County Air Pollution Control District to collaborate with SCPA and PG&E on finding long-term clean air alternatives for seven locations in SCPA's territory where PG&E is installing temporary diesel generators to address PSPS events.

ii. Focus on Disadvantaged Communities

SCPA has used CalEnviroScreen 3.0 to identify disadvantaged communities within SCPA territory. Figure 2 shows the CalEnviroScreen 3.0 map of Sonoma and Mendocino Counties. Figure 3 shows the one census tract within SCPA's service territory that is within the top 25% of impacted census tracts on a statewide basis, based on overall score. Note that the pollution burden percentile in this tract is not identified as being within the top 25%. The tract identified is census tract 6097153200 within the Roseland area of Southwest Santa Rosa with a population of 7,522. SCPA estimates that this tract represents 1.3% of its service territory.

SCPA does not have any power supply contracts with resources located in or adjacent to this tract.

Figure 2- CalEnviroScreen results of Sonoma and Mendocino Counties

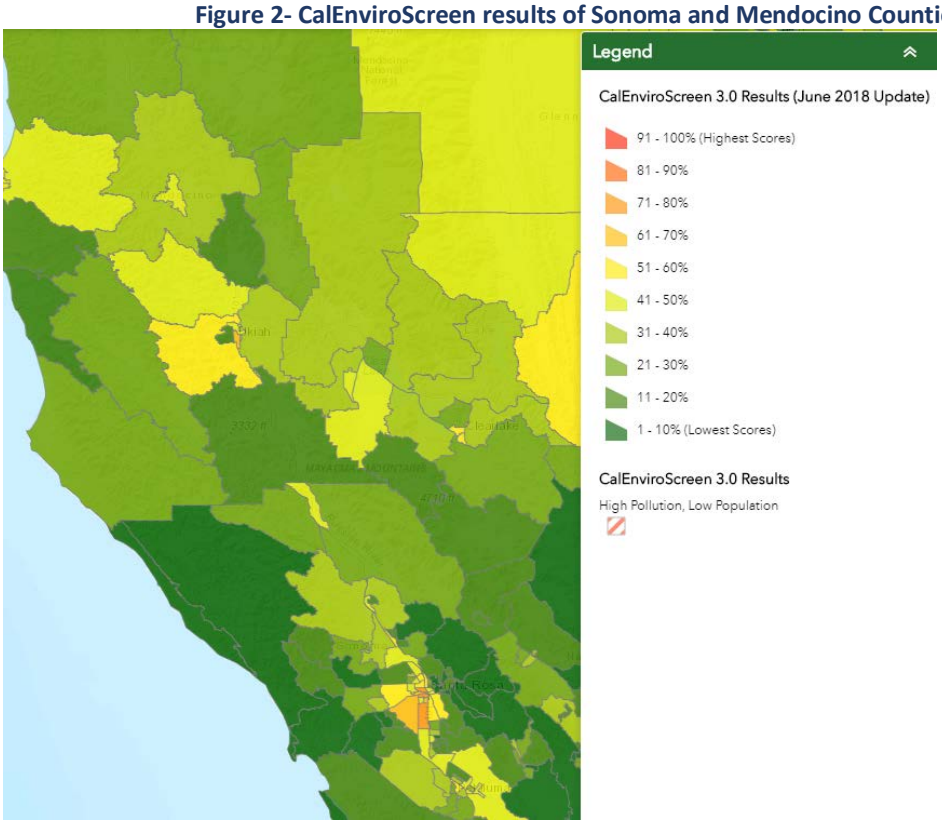
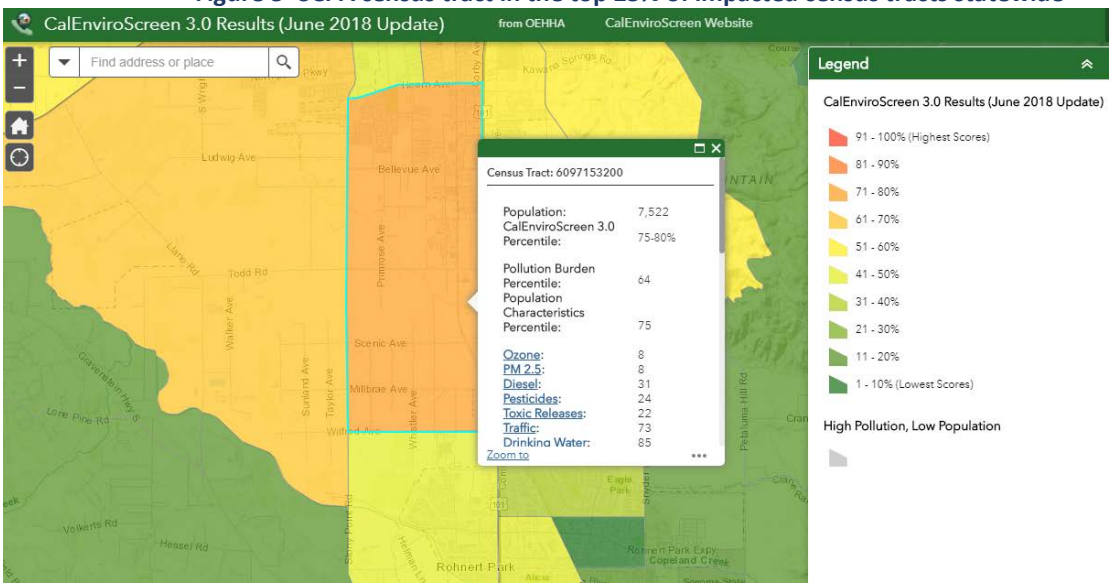


Figure 3- SCPA census tract in the top 25% of impacted census tracts statewide



SCPA does not have contracts for energy with GHG emitting resources in disadvantaged communities. The CalEnviroScreen 3.0 map identifies two existing SCPA resources in Kings County and one new SCPA resources in Stanislaus County located within IRP defined disadvantaged communities. All three resources are solar photovoltaic resources that do not contribute to pollution burden. SCPA does not plan to procure new fossil resources that would contribute to pollution burden. SCPA's Preferred Conforming Portfolio includes new biomass resources which contribute to air pollution. SCPA plans to adhere to all local permitting requirements, locate such resources away from disadvantaged communities, and seek public input on biomass procurement activities and siting through public workshops and meetings.

As part of its core mission, SCPA works to minimize criteria air pollutants. For this reason, SCPA has a clean supply portfolio that depends in large part on zero- and very low-emission generation technologies. In addition, many of SCPA's customer programs are designed to improve local air quality. Some of these do so by supporting transportation electrification, such as:

- Drive EV, which has enabled bulk discounts averaging more than $11,000 per car for the purchase or lease of 773 electric vehicles.
- EV Charging equipment for residents, with 2,923 Level 2 smart chargers deployed to date and 889 of those customers opting to enroll their equipment in SCPA's automated demand response program to promote renewable integration and reliability
- CalEVIP grant to deploy EV chargers throughout SCPA's service territory to meet regional needs

Other programs support behind-the-meter battery storage, distributed energy resources, energy efficiency kits, and building electrification. SCPA's Program Strategy Document outlines these programs and is available here on SCPA's website[2].

As part of SCPA's commitment to its community, SCPA is helping to rebuild the communities impacted by the October 2017 wildfires. SCPA committed $1 million to relief efforts and aided in coordinating funding requests for the region. SCPA recruited PG&E to partner on a joint program for the rebuild effort to incentivize deep energy efficiency, EV charging, onsite renewable energy with storage, and the avoidance of natural gas connections. Due to the success of this program, PG&E replicated it in the Camp Fire area.

SCPA has developed a 100% local renewable product which has been proposed for Title 24 energy compliance to help enable infill housing and not discriminate against denser urban development. Customers are able to pre-purchase a 20-year commitment to local, renewable energy. This customer payment is used to develop additional clean energy resources within SCPA's territory.

[2] https://sonomacleanpower.org/uploads/documents/SCP-Programs-Strategic-Action-Plan-June-2020.pdf

e. Cost and Rate Analysis

Under the direction of its Board of Directors and with the recommendation of its Community Advisory Committee along with input from the public, SCPA sets its rates in accordance with its Board-approved financial policies. SCPA attempts to smooth out changes in rates by using an internal balancing account.

f. System Reliability Analysis

SCPA evaluated the reliability of both the Preferred Conforming Portfolio and the 46 MMT Conforming Portfolio by comparing the monthly NQCs calculated in the resource data template against SCPA's projected RA obligation. As previously discussed, SCPA input RA resources provided by the portfolios along with CAM resources and input generic RA-only contracts for the remainder of the calculated obligation. The System Reliability Progress Tracking Table from the 46 MMT Resource Data Templates (Table 12) and SCPA's Preferred Conforming Portfolio (Table 13) are included below to document the NQC contribution by contract status and Effective Load Carrying Capacity (ELCC) type. The results for June are shown, which is the month SCPA anticipates its highest annual coincident peak.

Table 12- SCPA Preferred Conforming Portfolio System Reliability Progress Tracking Table (from 46 MMT Resource Data Template)

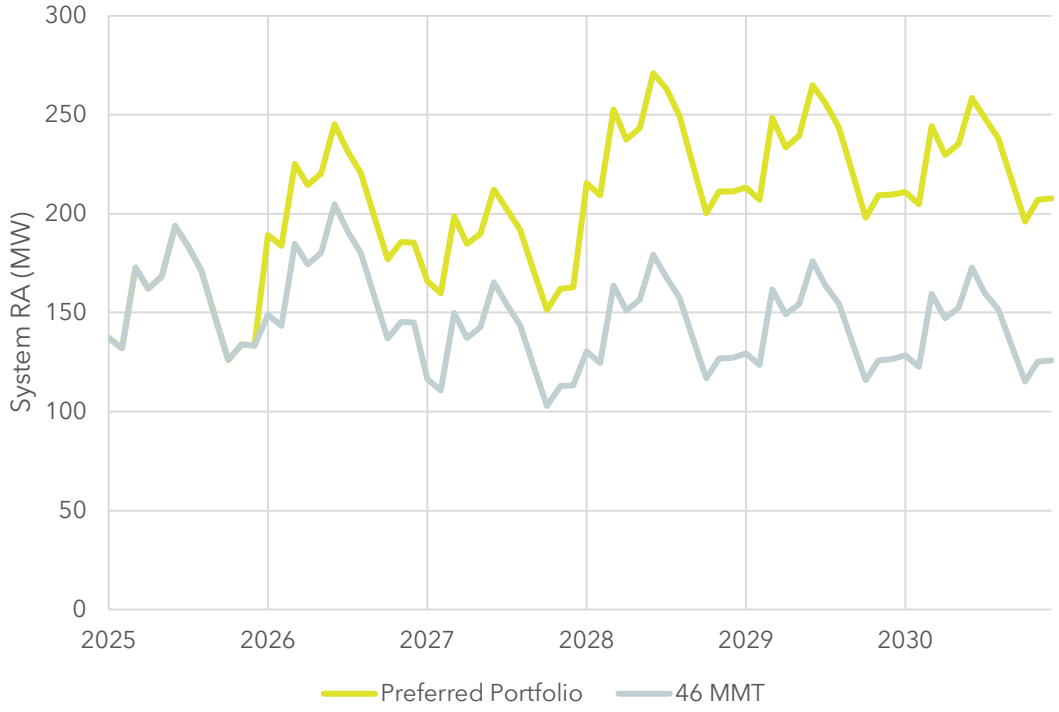
System Reliability Progress Tracking Table (NQC MW) for month of June by contract status, 38 MMT portfolio	ELCC type	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
online	wind_low_cf	29	29	29	29	32	20	22	22	22	22	22
online	biomass	3	4	4	0	0	0	0	0	0	0	0
online	cogen	0	5	2	0	0	0	0	0	0	0	0
online	geothermal	50	50	50	50	50	50	50	0	0	0	0
online	thermal	197	30	7	7	0	0	0	0	0	0	0
online	solar	56	56	56	56	48	16	13	12	10	9	7
online	unknown	289	128	104	24	24	0	0	0	0	0	0
development	wind_low_cf	0	26	26	26	30	34	38	38	38	38	38
development	unknown	0	0	0	0	13	11	9	8	7	6	5
review	Battery	0	0	35	35	35	35	35	34	34	33	33
planned_existing	geothermal	0	0	0	0	0	0	0	14	14	14	14
planned_existing	unknown	11	192	207	295	289	360	351	393	382	388	394
planned_new	battery	0	0	0	0	0	0	10	10	24	24	24
planned_new	solar	0	0	0	0	0	0	0	0	3	3	3
TOTAL supply, NQC MW		635	520	521	523	524	527	529	532	534	537	540

Table 13- SCPA Preferred Conforming Portfolio System Reliability Progress Tracking Table (from 38 MMT Resource Data Template)

System Reliability Progress Tracking Table (NQC MW) for month of June by contract status, 38 MMT portfolio	ELCC type	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
online	wind_low_cf	29	29	29	29	34	20	22	22	22	22	22
online	biomass	3	4	4	0	0	0	0	0	0	0	0
online	cogen	0	5	2	0	0	0	0	0	0	0	0
online	geothermal	50	50	50	50	50	50	50	0	0	0	0
online	thermal	197	30	7	7	0	0	0	0	0	0	0
online	solar	56	56	56	56	48	16	13	12	10	9	7
online	unknown	289	128	104	24	24	0	0	0	0	0	0
development	wind_low_cf	0	26	26	26	30	34	38	38	38	38	38
development	unknown	0	0	0	0	13	11	9	8	7	6	5
review	Battery	0	0	35	35	35	35	35	34	34	33	33
planned_existing	biomass	0	0	0	0	0	0	0	0	3	3	3
planned_existing	geothermal	0	0	0	0	0	0	0	21	21	21	21
planned_existing	psh	0	0	0	0	0	0	30	30	30	30	30
planned_existing	unknown	11	192	207	295	289	360	311	346	290	299	308
planned_new	biomass	0	0	0	0	0	0	0	0	4	4	4
planned_new	battery	0	0	0	0	0	0	20	20	62	61	60
planned_new	solar	0	0	0	0	0	0	0	0	13	11	9
TOTAL supply, NQC MW		635	520	521	523	524	527	529	532	534	537	540

Although SCPA's Resource Data Templates includes generic RA-only to reflect the expectation of fully meeting capacity obligations, the contribution without these contracts is more informative in evaluating comparative reliability between the 46 MMT Conforming Portfolio and SCPA's Preferred Conforming Portfolio. Figure 4 below plots the monthly RA contribution of system RA from the Preferred Conforming Portfolio and 46 MMT Conforming Portfolio. By 2030, the Preferred Conforming Portfolio is providing 86 MW more system RA than the 46 MMT Conforming Portfolio in June (with a monthly average of 84 MW more system RA) This is evidenced in the difference in Tables 12 and 13 'planned_existing' ELCC type 'unknown' NQC MW. This additional 86 MW in SCPA's Preferred Conforming Portfolio is over triple the 23 MW of SCPA's 38 MMT RSP load share of the natural gas capacity not retained relative to the 46 MMT RSP.

Figure 3- System RA from Portfolio (no Generic RA-Only Contracts)



Another check SCPA performed to validate the reliability of the Preferred Conforming Portfolio was to compare the size of the generic RA-only contracts to SCPA's 38 MMT RSP load share of natural gas resources. In 2030, SCPA's generic RA-only contracts average 262 MW per month. SCPA's 257 MW load share of natural gas capacity in the 38 MMT RSP Total Resource Mix would fill 98% of SCPA's open RA position. While SCPA seeks to minimize the use of natural gas, the decarbonization of the grid still significantly relies on natural gas capacity in this planning horizon for reliability. SCPA acknowledges that the reduced sales volume of natural gas may cause upward pressure on the cost of the reliability resource, however this potential increased cost makes a further economic case for more battery and long-duration storage deployment.

A final point is that SCPA deliberately exceeded its share of long-duration storage in the 38 MMT RSP Total Resource Mix to maximize reliability of the portfolio. SCPA's total planned procurement of long-duration storage in 2030 is 50 MW, compared to the 38 MMT RSP Total Resource Mix load share of 36 MW. SCPA identified the need for additional long-duration storage to match its load and mitigate the variability of its renewable resources. However, in crediting capacity in the template and determining required generic RA-only procurement, these resources receive roughly the same treatment as 4-hour batteries of the same capacity—despite having much more value in providing reliability.

g. Hydro Generation Risk Management

SCPA's Preferred Conforming Portfolio 2030 total resource mix includes a modest 12% of in-state hydro. SCPA does not currently plan explicitly for in-state hydro as a capacity resource

after 2022. SCPA anticipates that all the Preferred Conforming Portfolio in-state hydro will be provided by existing resources already paid for by SCPA customers through the PCIA charge or through market purchases of available existing resources. SCPA's Preferred Conforming includes 267 GWh of large in-state hydro and 9 GWh of small in-state hydro for a total of 276 GWh. Using the CSP Capacity Factors for Large Hydro and Small Hydro, this is the equivalent to 103 MW.

SCPA's own analysis of historical in-state hydro generation suggests that generation in years classified as "critical" by the California Department of Water Resources average 42% less than average conditions. A sensitivity to this occurrence in the CSP shows SCPA's Preferred Conforming Portfolio GHG emissions rising from 0.250 MMT/yr to 0.294 MMT/yr, still well within SCPA's GHG benchmark of 0.326 MMT/yr in the 38 MMT portfolio. Because carbon emissions are cumulative and any given calendar year emissions do not represent a true measure of emissions, a rolling 3-year average of hydro production is more relevant than a fixed annual emission target. In practice, SCPA would take prudent measures to ensure the GHG emissions trend is decreasing such that the average annual emissions are below the GHG benchmarks set for SCPA. SCPA would seek to true-up in-state hydro generation shortages where necessary with short-term RPS contracts to satisfy its internal GHG targets. Additionally, there would likely be less renewable curtailment in a drought year that partially offsets lost energy and capacity.

h. Long-Duration Storage Development

SCPA participated in a joint Request for Information (RFI) with 12 other CCAs on long-duration storage in June 2020. There were 31 responses to the RFI and SCPA is currently reviewing all responses. SCPA has also expressed interest in a multi-CCA Joint Powers Authority (JPA) to collectively procure large capacity new buildout. SCPA and other CCAs are now engaging in the critical next step of issuing a joint Request for Offers (RFO) for long-duration storage to be COD by 2026. The RFO is expected to be issued by the end of September 2020 with the anticipation of executing one or more contracts in Q2 or Q3 of 2021. SCPA's share of this RFO will be a minimum of 20 MW and up to 50 MW. SCPA's staff and Board consider long-duration storage an important tool for providing a portion of California's needed capacity. SCPA has investigated a broad range of long-duration storage technologies, including very large lithium-ion battery systems, thermal storage, pumped hydro, mass wells, flow batteries and flywheels. SCPA has been studying the economic potential for a small pumped hydro facility within its territory since 2013; to date it has not proven cost effective in comparison with other commercially available options.

i. Out-of-State Wind Development

SCPA has no current plans to develop out-of-state wind resources. SCPA staff and Board would consider these resources as a potential supply, based on generation profile, deliverability, local environmental impact, etc.

j. Transmission Development

SCPA existing and planned resources are identified in the Preferred Conforming Portfolio Resource Data Template. SCPA identifies which resources have been contracted since the IRP baseline was formed by indicating the resources as incremental in the Resource Data Template.

SCPA does not have specific locations determined for uncontracted resources. Interconnection queue positions, where known, are identified in the Resource Data Template.

SCPA has no plans to develop transmission upgrades. However, SCPA staff are actively seeking information from PG&E about planned upgrades to the transmission system segments that affect our territory. The goal of this is to understand the PSPS and fire risks facing our customers, and to inform future programs aimed at reducing the impact of planned or unplanned transmission-level outages.

IV. Action Plan

SCPA's Action Plan described herein references only procurement activity for the Preferred Conforming Portfolio adopted by SCPA's governing board. The CPUC IRP process for LSEs currently occurs every two years, however SCPA revisits the Action Plan each year and as significant changes in load or resources availability occur. SCPA's Action Plan covers the duration of the IRP planning period (through 2030), however the specific actions identified herein reflect specific plans through the remainder of 2020 and will be optimized as necessary through SCPA's internal planning process to achieve CPUC benchmarks and SCPA internal goals.

a. Proposed Activities

SCPA's procurement activities are structured to meet compliance obligations and internal goals. SCPA must continually shape the characteristics of its portfolio in accordance with legislative and policy changes, technological improvements, changes in customer electricity usage and usage patterns, and new information about markets and risk. To manage this uncertainty, SCPA continually examines and estimates supply and customer demand, including demand trends as they relate to population of customers served, climate, weather events, natural disasters, Public Safety Power Shutoffs, epidemics and pandemics, energy efficiency, distributed generation, electrification of vehicles and buildings, and emerging industries.

With respect to disadvantaged communities (in California) as defined by CalEnviroScreen 3.0, SCPA has one existing resource and two potential new resources located in such communities. All three resources are solar photovoltaic resources that do not contribute to pollution burden. SCPA does not plan to procure new fossil resources that would contribute to pollution burden. SCPA's Preferred Conforming Portfolio includes new biomass resources which contribute to air pollution. SCPA plans to adhere to all local permitting requirements, locate such resources away from disadvantaged communities, and seek public input on biomass procurement activities and siting through public workshops and meetings.

b. Procurement Activities

SCPA structures its procurement efforts to balance customer demand with resource commitments. SCPA also considers the deliverability characteristics of its resources and reviews the respective risks associated with short and long-term purchases as part of its forecasting and procurement processes. These efforts have led to a diverse resource mix that addresses grid integration issues, closely matches SCPA electrical supply to customer demand and reduces ratepayer risk. SCPA continuously examines and estimates supply and customer demand, including demand trends as they relate to the number of customers served, climate, energy efficiency, distributed generation, electrification of vehicles and buildings, emerging industries, and more recently impacts of Public Safety Power Shutoffs, evacuations, and COVID-19 impacts. SCPA examines the need to procure or sell excess resources when significant change in load is expected to occur. If further procurement is deemed necessary, Requests for Offers (RFOs) to fill these needs are issued to the market and offers are assessed to determine the best outcome for SCPA's portfolio.

Table 14 shows the expected timeline for procurement activity to achieve the 2030 Preferred Conforming Portfolio. Note that Existing Market Resource MW values represent equivalent MW using the CSP Capacity Factors for the GWh listed for each resource in the CSP.

Table 14 – Cumulative planned procurement for SCPA's Preferred Conforming Portfolio

Cumulative MW procurement

Resource Type	2021	2022	2023	2024	2026	2030
Existing Solar Contracts	76	76	126	126	126	126
New Solar Contracts	0	0	0	0	6	91
Existing Market Resource Solar	0	0	127	127	127	124
Existing Wind Contracts	126	126	126	126	126	126
Existing Market Resource Wind	0	0	29	29	29	24
Existing Geothermal Contracts	50	50	50	50	50	0
New Geothermal Contracts	0	0	0	0	0	30
New Biomass Contracts	0	0	0	0	0	8
Existing Market Resource Biomass	0	0	5	5	5	4
Existing Hydro Contracts	45	45	26	26	0	0
New Hydro Contracts	6	6	0	0	25	32
Existing Market Resource Hydro	99	99	103	103	103	103
Existing 4-hr Battery Storage Contracts	35	35	40	40	40	40
New 4-hr Battery Storage Contracts	0	0	0	0	0	44
New Long Duration (8-12 hr) Storage Contracts	0	0	0	0	50	50

The procurement activity timeline for the new contracts listed in Table 14 is discussed below:

- New solar contracts
  - 6 MW new local solar for EverGreen customers with Commercial Operation Date (COD) by 2026 with solicitations starting Q1 2021

        - Potentially combined with short-duration battery storage
        - Note that while SCPA currently expects and plans for additional solar to serve EverGreen customers, any form of local renewable energy could be used. A plan specific to EverGreen will be determined as the result of a SCPA public process
    - 85 MW of new CAISO solar to achieve COD between 2027 and 2030 with solicitations starting in 2024
    - Existing Market Resource Solar will be accepted, or a comparable RPS product will be procured by 2023
- New battery storage
    - SCPA has recently executed a new 35 MW 4-hr battery storage long-term RA only contract to achieve COD August 1, 2021 with a 10-year delivery term.
    - The remaining 4-hr battery storage will be paired with PV solicitations above.
- New geothermal contracts
    - SCPA will solicit for existing geothermal resources in 2025/2026 for deliveries starting in 2027.
    - Existing Market Resource geothermal will be accepted, or a comparable RPS product will be procured by 2023
- New biomass contracts
    - SPCA is currently exploring new local wildfire mitigation projects that would utilize forest thinning materials for a new biomass energy resources to achieve COD by 2030.
    - SCPA will solicit for existing biomass resources, if deemed necessary, in 2029 for deliveries in 2030.
    - Existing Market Resource biomass will be accepted, or a comparable RPS product will be procured by 2023
- New in-state hydro contracts
    - SCPA recently executed a contract for an existing in-state hydro resource for deliveries during 2021
    - Existing Market Resource in-state hydro will be accepted or procured each year starting in 2021. The anticipated MWh amounts of PCIA allocations accepted are not made known until quarterly reports are issued by PG&E after deliveries have been made.
- New import hydro contracts
    - SCPA will solicit for existing import hydro resources starting Q4 2020 for deliveries starting 2021 with no more than 4-year duration SCPA will continue to procure on a 4-year cycle and annually for any true-ups needed.
- New long duration storage contracts
    - SCPA participated in a joint RFI with 12 other CCAs in June 2020. 31 responses were received for multiple technologies to achieve COD by 2026. SCPA and other CCAs are now engaging in the critical next step of issuing a joint Request for Offers (RFO). The RFO is expected to be issued by the end of September 2020 with the anticipation of executing one or more contracts in Q2 or Q3 of 2021. SCPA's share of this RFO will be a minimum of 20 MW and up to 50 MW.

- SCPA will solicit for the remaining MW from existing long-duration storage resources in 2024 deliveries by 2026.

In addition to the actions listed above, SCPA will continue to monitor the status of the existing Sand Hill C wind contract. In the short term, SCPA will replace 2021 deliveries with similar renewable energy generation. If the contract default and termination clause conditions are met, SCPA will consider terminating the project and seeking another new build renewable energy project with a similar (or preferable) generation profile. As noted previously, SCPA does not rely on Sand Hill C to meet its incremental ordered procurement requirements.

Incremental Procurement Toward Milestone #1

SCPA has executed contracts as of September 1, 2020 for incremental capacity as shown in Table 15. SCPA meets its incremental procurement obligation for all years (2021-2023). As discussed, though SCPA has an executed contract with Sand Hill C Wind for 80 MW of incremental capacity (12 MW September NQC), this resource is not needed to meet the SCPA obligation.

Table 15 – SCPA Incremental Ordered Procurement (MW September NQC)

Resource (as reported in Resource Data Templates)	2021	2022	2023
RDT Resource #8- Solano_Wind (Sand Hill C) *	12	12	12
RDT Resource #9 New_Hybrid (Proxima Solar + Storage)			7
RDT Resource #22 SutterEnergyCC-Total	6.8	7.3	7.3
RDT Resource #154 New_Li_Battery (Mustang Battery)	35	35	35
Total MW	53.8	54.3	61.3
Total MW without Sand Hill C	41.8	42.3	49.3
SCPA MW Obligation	**21.7**	**32.8**	**43.3**

*See discussion of Sand Hill C in "Study Results".

All resources within SCPA's Action Plan are viable as proven technologies and are determined available according to the RSP. The long-range procurement timeline is feasible and is within SCPA's proven planning timelines or planning timelines indicated by developers because of RFIs.

Procurement barriers are discussed below.

c. Potential Barriers

For procurement decisions, SCPA considers procurement barriers which may include the following:

- The timing of CPUC decisions about mandatory or voluntary allocations of PCIA resources to SCPA, which could occur too late to allow timely procurement and compliance.
- Construction timelines, especially COVID-related construction and material lead-time delays.

- Load changes due to COVID or other unanticipated events
- The risk of CAISO curtailments of solar and wind resources that exceed current forecasts.
- The risk of long-term resource procurement without any certainty of cost recovery
- Assignment of unexpected and unplanned resources (for example, through CAM, RMR, CPM)
- Potential retirements of existing resources
- Legislative and regulatory changes which remove the value of existing contracts (for example, if existing long-term resource adequacy contracts are not fully valued by a central procurement entity)
    - While SCPA is committed to procuring resources to relieve local transmission constraints, the recently adopted CPE framework could impose some uncertainty for SCPA and its counterparties to appropriately value the local resource premiums. The mechanism would also introduce some uncertainty for System and Flex RA compliance product procurement, as LSEs need to consider the allocation of those attributes from the CPE to ensure that their activities do not lead to over-procurement of System and Flex resources. As compliance year 2023 approaches, SCPA will need to carefully evaluate its portfolio to develop its strategies to participate in the CPE's auction and manage its RA positions.
    - As stated in this plan, SCPA is part of a CCA group that conducted a long-duration storage RFI and is planning to participate in a joint RFO. SCPA is concerned that if legislative mandates for long-duration storage are ordered, these may disrupt the IRP planning process, and could lead to stranded assets if the timing of the mandate does not align with IRP modeling results and CCA procurement activity.
- Mandatory procurement obligations that may not fit within SCPA's long-term procurement plans.
- Executive orders or other national policy that restricts trade with international suppliers

These potential barriers are in addition to the common procurement barriers such as interconnection approval, counterparty credit risk, and project permitting.

d. Commission Direction or Actions

This section is not applicable to CCAs.

e. Diablo Canyon Power Plant Replacement

SCPA's Preferred Conforming Portfolio closely matches its load share of the 38 MMT New Resource Buildout and exceeds its load share of the 46 MMT RSP New Resource Buildout for total renewables in both 2024 and 2026. SCPA's Preferred Conforming Portfolio exceeds its load share of long duration storage in 2026 and allows for more than double the 38 MMT RSP total resources load share for baseload geothermal power. There is no specific New Resource Buildout identified for 2025 in the RSP. It would be helpful if the CPUC specifically addressed 2025 in the RSP New Resource Buildout since this is of noted concern.

SCPA contracts for 50 MW of geothermal baseload power through 2026 and plans to continue with 30 MW beyond 2026 in the Preferred Conforming Portfolio. This is significantly above SCPA's share of the 38 MMT RSP. SCPA is actively developing additional 4-hr battery storage and has begun the process of planning for long-duration storage. These three resource types are what SCPA would likely rely on in an event of a need for additional supply of low-GHG baseload resources. SCPA's Preferred Conforming Portfolio also includes small-scale biomass to process the large amount of wood waste generated from fire abatement work in SCPA territory.

As discussed previously, SCPA's Preferred Conforming Portfolio deliberately exceeded its share of long-duration storage in the 38 MMT RSP Total Resource Mix to maximize reliability of the portfolio. SCPA's total planned procurement of long-duration storage in 2030 is 50 MW, compared to the 38 MMT RSP Total Resource Mix load share of 36 MW. SCPA identified the need for additional long-duration storage to match its load and mitigate the variability of its renewable resources. It should be noted that long-duration storage receives the same treatment in the CPUC templates as 4-hr storage of the same capacity—despite having much more value in providing reliability. In addition, the use of batteries for both short and long-duration storage has the added benefit of increasing the flexible and ramping resources on the grid relative to baseload nuclear power.

SCPA's intentional diverse mix of resource technologies and locations and its commitment to promoting demand side resources to shift load and respond to reliability needs makes concerns about replacing baseload nuclear power negligible.

V. Lessons Learned

SCPA believes that the IRP process has been aided by making long-term resource planning by all CPUC-jurisdictional LSEs a more transparent process. SCPA recognizes that common inputs and assumptions are important for a uniform evaluation of LSE portfolios by regulators, and their ultimate aggregation into a system portfolio. SCP, does however, adhere to its own specific methodology to ultimately determine the SCPA power mix and procurement timeline. In particular, SCPA uses the best available data including forecasted load data as it relates to the number of customers served, climate, energy efficiency, distributed generation, electrification of vehicles and buildings, emerging industries, and more recently impacts of Public Safety Power Shutoffs, evacuations, and COVID-19 impacts. Whereas, the CPUC process relies on older

information established through a formal forecasting process. As an aside, SCPA appreciates the CPUC for allowing LSEs to modify the original forecast to include the departure of Direct Access customers, however significant changes to load forecast due to COVID-19 have also occurred since then. SCPA does input resources established from its internal methodology into the CPUC methodology to determine conforming emissions and reliability metrics. These two lenses of evaluation are not mutually exclusive. CPUC staff should use the most accurate representation of the system for a top-down evaluation. It is similarly appropriate for SCPA staff to use precise inputs based on local data to best forecast needs for SCPA customers. SCPA remains committed to working collaboratively with CPUC staff as the IRP process continue to evolve.

SCPA found the CSP tool provided as part of the IRP process valuable in understanding the system reliability and emissions implications of internal procurement decisions. Evaluating performance of portfolios in the CSP informed the magnitude of required battery and long-duration storage for SCPA. Meanwhile, the results of the RSP provided SCPA with high-level signals on the expected availability of import and in-state hydro resources. With these insights, SCPA created a Preferred Conforming Portfolio that meets the objectives of the SCPA governing Board while also representing its share of system capacity and honoring projections of market availability.

SCPA highlights that IOUs are instructed to report their excess generating resources CCA customers pay for in their PCIA fee in the IOU baseline portfolios. This IRP policy has the effect of causing IOU portfolios to significantly overstate their use of GHG-free energy. This policy also does not match actual procurement needs, and as a result, SCPA includes estimates of PCIA resource allocations within its internal resources planning. SCPA customers pay for these resources, as do all other PG&E customers but are not allocated any resources for inclusion in this IRP. Allowing PG&E to exclusively include more resources than are needed to meet its own load when it is paid for by all customers will result in costly over-procurement by all ratepayers. It overestimates SCPA's unmet planned need and requires additional procurement while saddling all ratepayers with the cost of resources that are no longer needed to meet PG&E's load. SCPA has already accepted PCIA allocations for hydro and denied nuclear allocations for 2020. SCPA plans for ongoing carbon free hydro allocations as well as RPS allocations starting in 2023 for existing solar, wind, geothermal, biomass, and small hydro for SCP's fair share of PG&E's legacy portfolio. The CPUC has not yet ruled on whether these resources will be allocated in the future, however SCPA assumes that if they are not allocated, they will be made available to the market due to PG&E not needing them to serve their own customer load. The CPUC should carefully consider in future reporting years, which customers these resources will ultimately serve, and which customers are paying for these resources to ensure IOU GHG-free results are not overstated.

While the RSP provided high-level guidance for SCPA's Preferred Conforming Portfolio based on what the CPUC-ordered optimal portfolio would be, the RSP neglects to address 2025, which is a particularly important year in the phased retirement of Diablo Canyon. SCPA recommends that the CPUC specifically addressed 2025 in the RSP New Resource Buildout.

SCPA notes that demand side resources are not modelled to reflect individual LSE's plans and programs. The IEPR load forecast assignment uses standard statewide load modifiers for many behind-the-meter resources such as Electric Vehicles and charging infrastructure, energy efficiency, behind the meter solar and storage, building electrification, and usage pattern changes as result of time-of-use rate setting. These statewide modifiers may not be appropriate for each LSE and therefore, the CPUC should allow for customized behind-the-meter resources to be applied.

SCPA highlights a lesson learned from the 2018 IRP cycle. Ordered incremental procurement was spread evenly to each LSE based on load share regardless of each LSE's existing procurement efforts and portfolio metrics. SCPA recommends that any future ordered procurement should be based on the LSE specific contribution (or lack thereof) to reliability. Ordering evenly distributed procurement without acknowledging LSE specific procurement activities penalizes LSEs that procure in a timely fashion, causing additional costs to customers served by these LSEs, and implicitly encourages delayed action and free riding.

SCPA would also like to highlight the timing difficulties between incorporating the RPS Procurement Plans and IRP plans. The changing submission dates and disconnects between approval timelines means that LSEs cannot address the IRP items required in their RPS Procurement Plans by the submittal date. Another timing concern is that IRP plans must be submitted before the RPS Procurement Plans are approved and finalized by the CPUC.

LSEs were not provided with sufficient time to respond to new instructions and changes to the templates published in the IRP FAQs made available on August 11, 2020. The compressed time allowed for LSEs to incorporate these changes created unnecessarily crunched timelines. Given the importance of the IRP for statewide planning efforts, this should be avoided in the future. SCPA encourages the CPUC to continue staffing and providing resources to the IRP team such that templates and instructions issued are thorough, consistent, and correct to avoid extensive FAQ and last-minute direction.

Glossary of Terms

Alternative Portfolio: *LSEs are permitted to submit "Alternative Portfolios" developed from scenarios using different assumptions from those used in the Reference System Plan. Any deviations from the "Conforming Portfolio" must be explained and justified.*

Approve (Plan)*: the CPUC's obligation to approve an LSE's integrated resource plan derives from Public Utilities Code Section 454.52(b)(2) and the procurement planning process described in Public Utilities Code Section 454.5, in addition to the CPUC obligation to ensure safe and reliable service at just and reasonable rates under Public Utilities Code Section 451.*

Balancing Authority Area (CAISO): *the collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The Balancing Authority maintains load-resource balance within this area.*

Baseline resources: *Those resources assumed to be fixed as a capacity expansion model input, as opposed to Candidate resources, which are selected by the model and are incremental to the Baseline. Baseline resources are existing (already online) or owned or contracted to come online within the planning horizon. Existing resources with announced retirements are excluded from the Baseline for the applicable years. Being "contracted" refers to a resource holding signed contract/s with an LSE/s for much of its energy and capacity, as applicable, for a significant portion of its useful life. The contracts refer to those approved by the CPUC and/or the LSE's governing board, as applicable. These criteria indicate the resource is relatively certain to come online. Baseline resources that are not online at the time of modeling may have a failure rate applied to their nameplate capacity to allow for the risk of them failing to come online.*

Candidate resource: *those resources, such as renewables, energy storage, natural gas generation, and demand response, available for selection in IRP capacity expansion modeling, incremental to the Baseline resources.*

Capacity Expansion Model: *a capacity expansion model is a computer model that simulates generation and transmission investment to meet forecast electric load over many years, usually with the objective of minimizing the total cost of owning and operating the electrical system. Capacity expansion models can also be configured to only allow solutions that meet specific requirements, such as providing a minimum amount of capacity to ensure the reliability of the system or maintaining greenhouse gas emissions below an established level.*

Certify (a Community Choice Aggregator Plan)*: Public Utilities Code 454.52(b)(3) requires the CPUC to certify the integrated resource plans of CCAs. "Certify" requires a formal act of the Commission to determine that the CCA's Plan complies with the requirements of the statute and the process established via Public Utilities Code 454.51(a). In addition, the Commission must review the CCA Plans to determine any potential impacts on public utility bundled customers under Public Utilities Code Sections 451 and 454, among others.*

Clean System Power (CSP, formerly "Clean Net Short") methodology*: the methodology used to estimate GHG emissions associated with an LSE's Portfolio based on how the LSE will expect to rely on system power on an hourly basis.*

Community Choice Aggregator*: a governmental entity formed by a city or county to procure electricity for its residents, businesses, and municipal facilities.*

Conforming Portfolio*: the LSE portfolio that conforms to IRP Planning Standards, the 2030 LSE-specific GHG Emissions Benchmark, use of the LSE's assigned load forecast, use of inputs and assumptions matching those used in developing the Reference System Portfolio, as well as other IRP requirements including the filing of a complete Narrative Template, a Resource Data Template and Clean System Power Calculator*.

Effective Load Carrying Capacity*: a percentage that expresses how well a resource is able avoid loss-of-load events (considering availability and use limitations). The percentage is relative to a reference resource, for example a resource that is always available with no use limitations. It is calculated via probabilistic reliability modeling and yields a single percentage value for a given resource or grouping of resources.*

Electric Service Provider*: an entity that offers electric service to a retail or end-use customer, but which does not fall within the definition of an electrical corporation under Public Utilities Code Section 218.*

Filing Entity*: an entity required by statute to file an integrated resource plan with CPUC.*

Future*: a set of assumptions about future conditions, such as load or gas prices.*

GHG Benchmark (or LSE-specific 2030 GHG Benchmark)*: the mass-based GHG emission planning targets calculated by staff for each LSE based on the methodology established by the California Air Resources Board and required for use in LSE Portfolio development in IRP.*

GHG Planning Price: *the systemwide marginal GHG abatement cost associated with achieving a specific electric sector 2030 GHG planning target.*

Integrated Resources Planning Standards (Planning Standards)*: the set of CPUC IRP rules, guidelines, formulas and metrics that LSEs must include in their LSE Plans.*

Integrated Resource Planning (IRP) process*: integrated resource planning process; the repeating cycle through which integrated resource plans are prepared, submitted, and reviewed by the CPUC*

Long term*: more than 5 years unless otherwise specified.*

Load Serving Entity*: an electrical corporation, electric service provider, community choice aggregator, or electric cooperative.*

Load Serving Entity (LSE) Plan*: an LSE's integrated resource plan; the full set of documents and information submitted by an LSE to the CPUC as part of the IRP process.*

Load Serving Entity (LSE) Portfolio*: a set of supply- and/or demand-side resources with certain attributes that together serve the LSE's assigned load over the IRP planning horizon.*

Loss of Load Expectation (LOLE): *a metric that quantifies the expected frequency of loss-of-load events per year. Loss-of-load is any instance where available generating capacity is insufficient to serve electric demand. If one or more instances of loss-of-load occurring within the same day regardless of duration are counted as one loss-of-load event, then the LOLE metric can be compared to a reference point such as the industry probabilistic reliability standard of "one expected day in 10 years," i.e. an LOLE of 0.1.*

Net Qualifying Capacity: *Qualifying Capacity reduced, as applicable, based on: (1) testing and verification; (2) application of performance criteria; and (3) deliverability restrictions. The Net Qualifying Capacity determination shall be made by the California ISO pursuant to the provisions of this California ISO Tariff and the applicable Business Practice Manual.*

Non-modeled costs*: embedded fixed costs in today's energy system (e.g., existing distribution revenue requirement, existing transmission revenue requirement, and energy efficiency program cost).*

Nonstandard LSE Plan*: type of integrated resource plan that an LSE may be eligible to file if it serves load outside the CAISO balancing authority area.*

Optimization*: an exercise undertaken in the CPUC's Integrated Resource Planning (IRP) process using a capacity expansion model to identify a least-cost portfolio of electricity resources for meeting specific policy constraints, such as GHG reduction or RPS targets, while maintaining reliability given a set of assumptions about the future. Optimization in IRP considers resources assumed to be online over the planning horizon (baseline resources), some of which the model may choose not to retain, and additional resources (candidate resources) that the model is able to select to meet future grid needs.*

Planned resource: *any resource included in an LSE portfolio, whether already online or not, that is yet to be procured. Relating this to capacity expansion modeling terms, planned resources can be baseline resources (needing contract renewal, or currently owned/contracted by another LSE), candidate resources, or possibly resources that were not considered by the modeling, e.g., due to the passage of time between the modeling taking place and LSEs developing their plans. Planned resources can be specific (e.g., with a CAISO ID) or generic, with only the type, size and some geographic information identified.*

Qualifying capacity*: the maximum amount of Resource Adequacy Benefits a generating facility could provide before an assessment of its net qualifying capacity.*

Preferred Conforming Portfolio*: the conforming portfolio preferred by an LSE as the most suitable to its own needs; submitted to CPUC for review as one element of the LSE's overall IRP plan.*

Preferred System Plan: *The Commission's integrated resource plan composed of both the aggregation of LSE portfolios (i.e., Preferred System Portfolio) and the set of actions necessary to implement that portfolio (i.e., Preferred System Action Plan).*

Preferred System Portfolio: *the combined portfolios of individual LSEs within the CAISO, aggregated, reviewed and possibly modified by Commission staff as a proposal to the Commission, and adopted by the Commission as most responsive to statutory requirements per Pub. Util. Code 454.51; part of the Preferred System Plan.*

Reference System Plan: *the Commission's integrated resource plan that includes an optimal portfolio (Reference System Portfolio) of resources for serving load in the CAISO balancing authority area and meeting multiple state goals, including meeting GHG reduction and reliability targets at least cost.*

Reference System Portfolio*: the multi-LSE portfolio identified by staff for Commission review and adopted/modified by the Commission as most responsive to statutory requirements per Pub. Util. Code 454.51; part of the Reference System Plan.*

Short term*: 1 to 3 years (unless otherwise specified).*

***Staff**: CPUC Energy Division staff (unless otherwise specified).*

***Standard LSE Plan**: type of integrated resource plan that an LSE is required to file if it serves load within the CAISO balancing authority area (unless the LSE demonstrates exemption from the IRP process).*