# BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Develop an Electricity Integrated Resource Planning Framework and to Coordinate and Refine Long-Term Procurement Planning Requirements

**R. 16-02-007** (Filed February 11, 2016)

## THE REGENTS OF THE UNIVERSITY OF CALIFORNIA 2018 INTEGRATED RESOURCE PLAN (ALTERNATIVE PLAN)

**Public Version** 

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August 1, 2018

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**Public Version** 

Pursuant to the February 8, 2018 Decision Setting Requirements for Load Serving Entities Filing Integrated Resource Plans (D. 18-02-018) in Rulemaking 16-02-007, The Regents of the University of California in its role as an Electric Service Provider ("UC") respectfully submits this Integrated Resource Plan ("IRP"). This plan will show that the total emissions attributable to UC's Preferred Portfolio, using the Clean Net Short Methodology and calculator tool for Greenhouse Gas ("GHG") accounting, are less than UC's GHG Emissions Benchmark for 2030.

The University of California includes ten campuses and five academic medical centers throughout California with over 250,000 graduate and undergraduate students and more than 200,000 faculty and staff. In 2013, the University of California announced its Carbon Neutrality Initiative. This initiative aims to have the University of California emit zero net greenhouse gas emissions ("GHGs") in our operations by 2025. This goal is a first for any major research university and expands upon California's GHG reduction and renewables portfolio standard ("RPS") goals.

To help achieve the ambitious goals of the University of California's Carbon Neutrality Initiative, UC registered as an Electric Service Provider ("ESP"), operating under The Regents of the University of California (ESP #1389). In 2015 we took over the role of

providing Direct Access ("DA") service to approximately 500 UC accounts spanning all or a portions of seven campuses and three medical centers. The UC's DA accounts are located in the service territories of all three of the large investor owned utilities ("IOUs"), and comprise approximately 25 percent of UC's total annual purchased electricity.

There is likely to be a high degree of alignment between UC's carbon neutrality strategy and the state-wide goals underlying the IRP process. As an example - by becoming an ESP, UC is able to control the energy portfolio that serves its DA accounts and is consequently able to assemble a supply portfolio of clean and sustainable resources. To that end, UC has executed power purchase agreements for all of the output from two solar facilities located in Fresno County. The combined installed capacity of these two projects is 80 MW. Both projects are online and generating carbon-free electricity.

#### STUDY DESIGN

UC's focus for the 2018 planning cycle has been to understand the current IRP framework and evaluate how early actions in support of the University of California's Carbon Neutrality Initiative are measured in the context of this framework.

## Load Assignment

In accordance with the Energy Division's guidance for the Type 1 Alternative plan, UC took its most recent year-ahead load forecast filing for RA (for calendar year 2019) and extended the annual energy requirement out to 2030. UC's ESP load is below the 700 GWh annual energy threshold for requiring a Standard IRP, and is also below the 200 MW peak load threshold for filing Form S-1 with the California Energy Commission ("CEC").

## Required Portfolio

UC developed a portfolio using its assigned load forecast and LSE-Specific 2030 GHG Emissions Benchmark, along with the General Inputs, Demand Inputs, and Capacity Inputs required by the GHG Calculator. UC's portfolio is considered to be a "conforming portfolio" as we only changed the Custom inputs, Demand Inputs and Capacity inputs requested on the GHG Calculator dashboard as well as we declined to use custom profiles. The GHG Calculator is assumed to be consistent with the Reference System Portfolio and the IEPR 2017 demand forecast. No alternate portfolios were thought needed; the conforming portfolio is therefore considered to be UC's "preferred portfolio."

#### **GHG Emissions Benchmark**

UC calculated its LSE-specific GHG Emissions Benchmark using the 2030 GHG Emissions Benchmark data outlined in June 18, 2018 ALJ ruling, the corresponding Direct Access Load in each Utility Territory, and the previously-discussed 2030 Load Assignment. UC's GHG Emissions Benchmark, as calculated in the table below, is MMT.

	PG&E	SCE	SDG&E	TOTAL
2030 Load (GWh) for Direct Access	9,520	11,618	3,562	24,700
UC's Load (GWh)				
UC's Proportion of Direct Access Load	-			
2030 GHG Emissions Benchmark (MMT)	1.691	2.035	0.740	4.466
for Direct Access				₩
UC's GHG Emissions Benchmark (MMT)				

#### STUDY RESULTS

## **Preferred and Conforming Portfolios**

UC's preferred and conforming portfolios are one and the same, and consist of the following:

- Load assignment per Commission guidance (see Section 2)
- Assumed compliance with UC's energy storage mandate, pursuant to AB 2514
- Continued Solar production throughout term of existing contracts
- Procurement of large hydroelectric power comparable to 2018 volume

## GHG Accounting in IRP Planning

The total emissions attributable to UC's Preferred Portfolio, using the Clean Net Short Methodology and calculator tool for GHG accounting, are estimated to be 0.03 MMT CO2. This is less than UC's GHG Emissions Benchmark of MMT.

#### Local Air Pollutant Minimization

For the purposes of IRP, and consistent with the results of the California Communities Environmental Health Screening Tool Version 3 (CalEnviroScreen 3.0), "disadvantaged communities" refer to the 25% highest scoring census tracts in the state along with the 22 census tracts that score in the highest 5% of CalEnviroScreen's pollution burden, but which do not have an overall CalEnviroScreen score because of unreliable

socioeconomic or health data. Approximately seven percent of UC's Direct Access metered accounts are located in disadvantaged communities. For clarity, all our UC's Direct Access accounts are UC accounts. The location of accounts is geographic in nature related to the location of UC campuses served via Direct Access. We currently do not serve any non-UC load, nor does UC (as an ESP) own any generation, the energy supply for the ESP is contracted. All Direct Access customers contribute to IOU programs that support economic development in disadvantaged communities, through the payment of non-bypassable charges such as the Public Purpose Program surcharge.

A key finding from developing the Reference System Plan is that the largest opportunity to reduce air pollutants from the electric sector is by reducing the use of Combined Cycle Gas Turbines ("CCGTs"). It was also observed that new renewables selected by the RESOLVE model primarily displace CCGT use during daytime hours. There is currently no approved method for apportioning emissions of nitrogen oxides and particulate matter to individual LSEs. However, one of UC's long-term solar power purchase agreements is with a 20 MW generation resource, owned by a non-UC corporate entity. This resource is located in a California designated disadvantaged community. The presence of solar generation in such a community may reduce the local pollution burden.

## **Cost and Rate Analysis**

UC's preferred portfolio does not include incremental procurement, and as such there are no cost impacts to consider. UC's internal governance practices will manage any cost and rate considerations associated with achieving carbon neutrality.

As an ESP, UC receives quarterly allocations of RA capacity based on our customers' financial contribution to resources that are subject to the Cost Allocation Mechanism. There is currently no methodology for reflecting the GHG impacts of CAM allocations on ESP portfolios. It is assumed that energy from CAM resources would be reflected in the hourly grid carbon intensity calculations.

#### **Deviations from Current Resource Plans**

UC's preferred plan is consistent with its 2018 RPS Procurement Plan and with the underlying requirements of California's RPS program.

## Local Needs Analysis

Of the campuses primarily by UC via Direct Access, several are located in Local Capacity Areas, including Greater Bay Area (UC San Francisco and UC Santa Cruz),

Fresno Area (UC Merced), Los Angeles Basin (UC Irvine) and San Diego Area (UC San Diego). Both of UC's long term Solar PPAs, totaling 80 MW of installed capacity, qualify as PG&E Other local RA. UC will continue to aim to comply with all local RA requirements per annual and monthly RA processes, filings and related procurement.

## **ACTION PLAN**

No new procurement activities are required in the next 1 to 3 years to implement UC's preferred plan.

### **Proposed Activities**

As mentioned in Section 3.a.i., one of UC's long term solar PPAs is located in a disadvantaged community. UC has no plans to solicit bids for new gas-fired generating units. If UC decides to procure additional renewable resources in California, the proposal evaluation methodology will implemented in such a way that it gives preference to projects that will benefit disadvantaged communities.

## **Barrier Analysis**

The ongoing influence of the duck curve, or any subsequent daily load and price shapes, will impact the desire and ability of UC to procure additional California-sited renewable resources going forward.

#### LESSONS LEARNED

UC recognizes that this is the first iteration of Integrated Resource Planning for ESPs, and as such there was some confusion as to what load assumptions should be made and which aspects of the standard plan template should be addressed. In subsequent iterations of the Integrated Resource Planning process, UC hopes that the GHG calculator, or its successor, will be more easily customizable within the confines of a "conforming plan," for expected variations such as an ESP load shape that is compatible with typical commercial and industrial customers.

## OTHER REQUIREMENTS

The following forms are attached, as required:

- California Energy Commission (CEC) Form S1
- CEC Form S2
- CEC Power Content Report

DATED: August 1, 2018

Respectfully submitted,

/s/
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#### VERIFICATION

I, Mark Byron, am authorized to make this verification on behalf of The Regents of the University of California. I declare under penalty of perjury that the statements in the foregoing 2018 Integrated Resource Plan filed in Rulemaking 16-02-007 are true of my own knowledge, except as to matters which are therein stated on information or belief, and as to those matters I believe them to be true.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 1st, 2018, in Oakland, California.

Mark Byron, Executive Director Renewable Energy Programs

#### ELECTRICITY RESOURCE PLANNING FORMS

CEC Form S-1: Capacity Resource Accounting Table (issued 12/2016)

The Regents of the University of California

Where cell specifies more than one datum, separate data with a semicolon.

Yellow fills indicate confidentiality is being requested pursuant to Appendix A. 2018 MW numbers are illustrative.

Bold font cells sum automatically.

Data input by User are in dark green font.

	a semicolon.				Bold lont c	ens sum au	tomatically		Data input	by User are	in dark gree	n Iont.					
line	Capacity Resource Accounting Table (MW)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	PEAK LOAD CALCULATIONS	(4 Prior Fo	recasts ↓)	(Forecast S	Supply ⇒ )								2020	2027	2020	2027	2030
1	Forecast Total Peak-Hour 1-in-2 Demand	84															
2a	ESP Demand: Existing Customer Contracts	84															
2b	ESP Demand: New and Renewed Contracts	0															
2c	ESP Demand in PG&E service area	29															
2d	ESP Demand in SCE service area	23															
2e	ESP Demand in SDG&E service area	32															
3	Additional Achievable Energy Efficiency (-)																
4	Demand Response / Interruptible Programs (-)	0.															
5	Adjusted Demand: End-Use Customers	84															
6	Coincidence Adjustment (-)	(9)															
7	Coincident Peak-Hour Demand	74															
. 8	Required Planning Reserve Margin	11															
9	Credit for Imports That Carry Reserves (-)	0															
10	Firm Sales Obligations	0															
- 11	Firm LSE Procurement Requirement	86															
	CAPACITY SUPPLY RESOURCES																
12a	Total Fossil Fuel Supply	0															
12b	[state fuel; then list each resource, e.g., Fossil Unit 1]	0															
12c	[state fuel; then list each resource, e.g. Natural Gas; Fossil	0															
12d	[state fuel; then list each resource, e.g. Natural Gas; Fossil																
120	Unit N; list planned resources last]	0															
13a	Total Nuclear Supply	0															
13b	[Nuclear Unit 1]	0															
13c	[Nuclear Unit 2]	0															
14a	Total Hydroelectric Supply	0															
l4b	Total: Hydro Supply from Plants larger than 30 MW	0															
14c	Total: Hydro Supply from Plants 30 MW or less	0															
line	Capacity Resource Accounting Table (MW)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
15a	Total Utility-Controlled Renewable Supply	0			2010	2017	2020	2021	LULL	2023	2024	2023	2020	2027	2028	2029	2030
15b	Solar; Solar Project 1	0															
15c	Solar; Solar Project 2	0 :															
15d	[state fuel; then list each resource, Wind: Renewable Project																
130	N; list planned resources last]	0															
17a	Total Qualifying Facility (QF) Contract Supply	0															
17b	Biofuels	0															
17c	Geothermal	0															
17d	Small Hydro	0															
17e	Solar	0															
17f	Wind	0															
17g	Natural Gas	0															
17h	Other	0															
18a	Total Renewable Contract Supply	0															
18b	Renewable DG Supply	0															
18c	[state fuel; then Renewable Contract 1 (Supplier Name)]	0															
18d	[Small Hydro; then Renewable Contract 2 (Supplier Name)]	0															
18e	[Solar; then Renewable Contract N, list planned resources	0															
19a	Total Other Bilateral Contract Supply	0															
19b	Non-Renewable DG Supply	0															
19c	Combination; The Energy Authority, Inc.	0															
19d	[state fuel; then list each resource, e.g. Natural Gas: Other																
190	Bilateral Contract 2 (Supplier Name)]	0															

line	Capacity Resource Accounting Table (MW)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
19e	[Portfolio: Other Bilateral Contract 3 (Supplier Name)]	0	THE PARTY			TIVE IN		1	A LEWIS !						2020	202)	2030
19f	[System: Other Bilateral Contract N (Supplier Name)]	0															
19n	Planned Resources: list each on lines inserted below this line.	0															
20	Short-Term and Spot Market Purchases (and Sales)	86															
							77 17	N. C.			-		***	_	14/2/14		
	CAPACITY BALANCE SUMMARY															T	
21	Total: Existing and Planned Supply	86															
22	Firm LSE Procurement Requirement	86															
23	Net Surplus (or Need)	0															
24	Generic Renewable Supply	0															
25	Generic Non-Renewable Resources	0															
26	Specified Planning Reserve Margin	15%															

		MW	MW	MW
line	Historic LSE Peak Load:	Year 2015	Year 2016	Year 2017
27	Annual Peak Load / Actual Metered Deliveries	66.7		
28	Date of Peak Load for Annual Peak Deliveries	10/13/15		
29	Hour Ending (HE) for Annual Peak Deliveries	14		
30	Interruptible Load called on during that hour (+)	0.0		
31	Self-Generation and DG Adjustments	0.0		
32	Adjustments for Major Outages	0.0		
_ 33	Adjusted Annual Peak Load	66.7		

Lines	Notes
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## State of California California Energy Commission ELECTRICITY RESOURCE PLANNING FORMS CEC Form S-2: Energy Balance Table (issued 12/2016)



The Regents of the University of California

Where cell specifies more than one datum, separate data with a semicolon.

Yellow fills indicate confidentiality is being requested pursuant to Appendix A.

2018 GWh numbers are illustrative.

Bold font cells sum automatically.

Data input by User are in dark green font.

line	Energy Balance Table (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2020	2020
	ENERGY DEMAND CALCULATIONS	(↓ Actual S			Supply ⇒ )	2017	2020	2021	2022	2023	2024	2023	2020	2027	2028	2029	2030
1	Forecast Total Energy Demand / Consumption	305		( v ovecoust	Buppiy 1												
2a	ESP Demand: Existing Customer Contracts	305															
2b	ESP Demand: New and Renewed Contracts	0															
2c	ESP Demand in PG&E service area	137															
2d	ESP Demand in SCE service area	69															
2e	ESP Demand in SDG&E service area	99															
3	Additional Achievable Energy Efficiency (-)																
4	Demand Response / Interruptible Programs (-)	0															
5	Adjusted Demand: End-Use Customers	305															
6	Coincidence Adjustment [does not apply to S-2 form]		Value of the														
7	Coincident Peak-Hour Demand [does not apply to S-2]																
8	Required Planning Reserve [does not apply to S-2]																
9	Credit for Imports That Carry Reserves [does not apply]	L. CARRY															
10	Firm Sales Obligations	0															
11	Firm LSE Procurement Requirement	305															
	ENERGY SUPPLY RESOURCES				T						T		_				
12a	Total Fossil Fuel Supply	0			-1-												
12b	[state fuel; then list each resource, e.g., Fossil Unit 1]	0															
12c	state fuel; then list each resource, e.g. Natural Gas; Fossil	0															
12d	[state fuel; then list each resource, e.g. Natural Gas; Fossil	0															
124	Unit N; list planned resources last]	0															
13a	Total Nuclear Supply	0															
13b	[Nuclear Unit 1]	0															
13c	[Nuclear Unit 2]	0															
14a	Total Hydroelectric Supply	0															
14b	Total: Hydro Supply from Plants larger than 30 MW	0															
14c	Total: Hydro Supply from Plants 30 MW or less	0															
line	Energy Balance Table (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
15a	Total Utility-Controlled Renewable Supply	0														2027	2050
15b	Solar; Solar Project 1	0															
15c	Solar; Solar Project 2	0															
15d	[state fuel; then list each resource, Wind: Renewable Project	0															
	N; list planned resources last]	U															
17a	Total Qualifying Facility (QF) Contract Supply	0															
17b	Biofuels	0															
17c	Geothermal	0															
17d	Small Hydro	0															
17e	Solar	0															
17f	Wind	0															
17g	Natural Gas	0															
17h	Other	0															
18a	Total Renewable Contract Supply	0.															
18b	Renewable DG Supply	0															
18c	[state fuel; then Renewable Contract 1 (Supplier Name)]	0															
18d	[Small Hydro; then Renewable Contract 2 (Supplier Name)]	0															
18e	Solar; then Renewable Contract N, list planned resources	0															
19a	Total Other Bilateral Contract Supply	0															
19b	Non-Renewable DG Supply	0															
19c	[state fuel if known; then name Other Bilateral Contract 1]	0															
19d	[state fuel; then list each resource, e.g. Natural Gas: Other	0															
	Bilateral Contract 2 (Supplier Name)]																

line Energy Balance Table (GWh)	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
9e [Portfolio: Other Bilateral Contract 3 (Supplier Name)]	0									A-111	1000		HE SELECT	TAILO	-1100	
9f [System: Other Bilateral Contract N (Supplier Name)]	0	P. 1														
9n Planned Resources: list each on lines inserted below this line.	0	L. W. H. E.														
20 Short Term and Spot Market Purchases (and Sales)	0															
								W				####	13His	_		
ENERGY BALANCE SUMMARY								·								
21 Total: Existing and Planned Resources	0															
22 Firm LSE Procurement Requirement	305															
23 Net Surplus (or Need)																
24 Generic Renewable Supply																
25 Generic Non-Renewable Supply																

line	Notes
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Version: July 2018

#### **2017 POWER CONTENT LABEL**

## The Regents of the University of California

ENERGY RESOURCES	Power Mix	2017 CA Power Mix**
Eligible Renewable	45%	29%
Biomass & biowaste	0%	2%
Geothermal	0%	4%
Eligible hydroelectric	0%	3%
Solar	45%	10%
Wind	0%	10%
Coal	0%	4%
Large Hydroelectric	32%	15%
Natural Gas	0%	34%
Nuclear	0%	9%
Other	0%	<1%
Unspecified sources of power*	23%	9%
TOTAL	100%	100%

<sup>\* &</sup>quot;Unspecified sources of power" means electricity from transactions that are not traceable to specific generation sources.

<sup>\*\*</sup> Percentages are estimated annually by the California Energy Commission based on the electricity sold to California consumers during the identified year.

For specific information about this
electricity product, contact:

The Regents of the University of California

510-287-3846

For general information about the Power Content Label, please visit:

http://www.energy.ca.gov/pcl/

For additional questions, please contact the California Energy Commission at:

844-454-2906