



THE STATE OF THE RESOURCE ADEQUACY MARKET



September 2019



CALIFORNIA PUBLIC UTILITIES COMMISSION ENERGY DIVISION

A digital copy of this report can be found at:

<https://www.cpuc.ca.gov/RA/>

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LIST OF ACRONYMS

CAISO	California Independent System Operator	LSE	Load Serving Entity
CAM	Cost Allocation Mechanism	MA	Month Ahead
CCA	Community Choice Aggregator	MIC	Maximum Import Capability
CHP	Combined Heat and Power	MW	Megawatt
CPUC	California Public Utilities Commission	NQC	Net Qualifying Capacity
DER	Distributed Energy Resource	PG&E	Pacific Gas & Electric
DR	Demand Response	RA	Resource Adequacy
DRAM	Demand Response Auction Mechanism	RFO	Request for Offers
ESP	Electric Service Provider	RMR	Reliability Must Run
IOU	Investor Owned Utility	SCE	Southern California Edison
IV	Imperial Valley	SDG&E	San Diego Gas & Electric
LA	Los Angeles	TAC	Transmission Access Charge
LCR	Local Capacity Requirement	YA	Year Ahead

1 INTRODUCTION

California Public Utilities Commission (CPUC) Decision 19-02-022 directed Energy Division staff to prepare two reports that would provide “reasonable insight about the current and future state of the Resource Adequacy (RA) market”¹ in order to assist parties as they developed proposals for a central buyer of local RA.

The decision outlines five elements that the reports must address:

1. Total Megawatts (MW) for any/all resources procured (gas, storage, [renewable])/distributed energy resource (DER)) to meet RA requirements;
2. Development of preferred resources in local and system areas;
3. Information regarding local deficiencies, including the:
 - a. number of load serving entity (LSEs) that are deficient,
 - b. type of LSE (investor owned utility (IOU), community choice aggregator (CCA), electric service provider (ESP)),
 - c. location of deficiencies, amount of deficiencies (in MW),
 - d. number of local RA waiver requests, and anonymized statements from the LSE as to the reason for the deficiency (such as which generators bid into the solicitation, whether the bids included dispatch rights or other terms addressing how local resources bid in the energy market);
4. Information regarding system and flexible capacity deficiencies, including anonymized statements from the LSE as to the reason for the deficiency; and
5. Resources on the Net Qualifying Capacity list that are not shown in RA filings as under contract to an LSE(s).²

This document covers RA filings from the 2019 year ahead filing through the September month ahead filing. The second report must be released within 60 days of the October 31, 2019 filings for the 2020-2022 RA compliance years and will cover the remainder of 2019 and 2020 year ahead filings.

¹ D.19-02-022 at 31.

² D.19-02-022 at 31-32.

2 RESOURCES PROCURED FOR RA

Table 1 shows the megawatts (MW) of each resource type shown by CPUC-jurisdictional load serving entities (LSEs) on their month ahead RA plans to meet system and local RA requirements from January through September 2019.

Resources procured to meet reliability needs by the IOUs and allocated to all customers through the cost allocation mechanism (CAM) are listed under CAM/RMR/LCR resources unless their capacity was later sold to another LSE. Combined heat and power (CHP) and demand response procured through the demand response auction mechanism (DRAM) are allocated in the same manner as CAM resources and are included under CAM.³

LSEs also receive a credit for any RA capacity procured by the CAISO as reliability must run (RMR) resources. LSEs serving load in the Southern California Edison (SCE) transmission access charge (TAC) area receive a local capacity requirement (LCR) credit for behind-the-meter resources procured to meet reliability needs in the Los Angeles Basin. These resources are included under RMR/LCR/DRAM PRM with the planning reserve margin adder CPUC credits to DRAM resources. Capacity from utility demand response programs is also allocated to all LSEs by TAC area and shown here as DR Credit. CAM Natural Gas MW were adjusted to account for outages so that resources shown in Table 1 equal the CAM credit shown in Table 3.

As seen below, natural gas generators comprise the majority of RA resources for IOUs, CCAs, and ESPs and can account for approximately two thirds of total RA capacity in some months.

³ A list of 2019 CAM resources is available at <https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442461336>.

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Table 1: Resources Shown on Month Ahead System RA Plans by LSE Type (MW)

LSE Type	Resource Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
All	Battery Storage	85	81	80	80	82	80	79	93	92
	Biogas & Biomass	285	267	227	245	236	360	327	325	346
	CHP	1,465	1,429	1,305	1,224	1,299	1,553	1,380	1,496	1,455
	Demand Response	121	188	180	231	257	258	323	289	235
	Geothermal	1,155	1,101	1,066	1,029	1,036	1,073	1,075	1,036	1,035
	Hydro	2,117	1,755	2,528	2,297	2,650	4,030	4,081	3,978	3,729
	Natural Gas	22,094	21,081	20,203	20,134	20,691	22,452	23,197	24,430	24,629
	Nuclear	1,846	1,659	1,337	1,498	2,668	2,869	2,888	2,869	2,857
	Pumped Hydro	1,256	1,258	883	976	1,457	1,457	1,457	1,457	1,457
	Solar	10	189	716	2,480	2,403	4,335	4,117	4,105	3,388
	Unspecified Import	996	928	884	919	1,806	2,320	3,736	4,020	4,737
	Wind	602	895	975	1,609	1,708	2,567	1,630	1,487	1,514
	DR Credit	937	973	989	1,182	1,335	1,515	1,586	1,612	1,549
	RMR/LCR/DRAM PRM	316	372	373	336	345	361	367	370	367
	Total	33,284	32,176	31,744	34,238	37,972	45,229	46,243	47,568	47,389
CPUC RA Requirement	30,953	30,827	30,032	32,928	36,803	44,540	45,992	47,176	47,881	
% of Requirement	108%	104%	106%	104%	103%	102%	101%	101%	99%	
IOU	Battery Storage	6	2			2		2	4	3
	Biogas & Biomass	165	117	107	142	121	208	217	171	178
	CHP	397	198	314	173	302	478	429	465	418
	Geothermal	931	869	863	852	855	851	858	863	858
	Hydro	1,239	1,088	1,432	1,497	1,490	2,748	2,788	2,761	2,806
	Natural Gas	10,435	9,147	8,953	8,682	8,504	9,342	10,599	11,753	11,457
	Nuclear	1,741	1,606	1,337	1,498	2,416	1,875	2,068	1,877	2,085
	Pumped Hydro	919	1,133	744	259	1,339	1,313	1,389	1,239	1,084
	Solar	0	144	592	1,828	1,862	3,300	3,258	3,092	2,627
	Unspecified Import	380	259	311	264	739	916	1,912	2,354	2,527
	Wind	538	770	841	1,287	1,423	2,103	1,411	1,258	1,267
Total	16,751	15,332	15,493	16,483	19,051	23,134	24,930	25,837	25,310	
CCA	Battery Storage							10	10	10

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LSE Type	Resource Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	Biogas & Biomass	88	116	80	51	74	126	56	99	127
	CHP	47	280	1	123	115	47	49	27	46
	Demand Response								1	29
	Geothermal	139	150	137	118	120	159	159	115	113
	Hydro	800	609	984	647	1,017	991	1,011	1,075	701
	Natural Gas	3,861	4,060	3,561	3,607	4,372	4,934	4,508	4,503	4,736
	Nuclear	105	53			167	868	745	902	697
	Pumped Hydro	306	85	136	650	85	116		218	338
	Solar	0	16	46	422	294	776	487	603	375
	Unspecified Import	161	286	124	235	627	924	1,291	1,090	1,661
	Wind	33	56	68	189	143	172	133	148	125
	Total	5,539	5,712	5,138	6,043	7,015	9,112	8,449	8,790	8,957
ESP	Battery Storage						2			
	Biogas & Biomass	32	34	40	51	41	27	53	56	41
	CHP	17	54	20	22	19	24	18	48	16
	Geothermal	85	82	66	59	61	63	58	58	64
	Hydro	78	58	111	153	143	290	282	142	222
	Natural Gas	1,822	1,846	1,756	1,843	1,799	1,906	1,850	1,948	2,234
	Nuclear					85	126	75	90	75
	Pumped Hydro	31	40	2	66	33	29	68		35
	Solar	10	29	78	231	248	259	372	410	385
	Unspecified Import	455	383	449	420	440	480	534	576	549
	Wind	31	69	66	132	142	291	86	82	121
	Total	2,560	2,596	2,589	2,977	3,010	3,498	3,395	3,409	3,742
CAM/RMR/ LCR	Battery Storage	80	80	80	80	80	78	68	80	80
	CHP	1,004	897	969	905	864	1,003	884	955	976
	Demand Response	121	188	180	231	257	258	323	288	206
	Natural Gas	5,977	6,027	5,933	6,001	6,016	6,271	6,240	6,226	6,202
	DR Credit	937	973	989	1,182	1,335	1,515	1,586	1,612	1,549
	RMR/LCR/ DRAM PRM	316	372	373	336	345	361	367	370	367
	Total	8,434	8,536	8,524	8,736	8,897	9,484	9,468	9,532	9,379

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In Table 1, dynamically scheduled imports and pseudo-ties (resources located outside of the California Independent System Operator (CAISO) balancing area that bid into the CAISO market as individual resources) are listed under their resource type (nuclear, hydro, solar, etc.), while unspecified imports are listed separately. Table 2 shows total imports for each month when unspecified imports are combined with dynamically scheduled imports and pseudo-ties.

Table 2: All Imports Shown on Month Ahead RA Plans by LSE Type

LSE Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
IOU	1,398	1,134	1,337	935	1,434	2,068	3,061	3,505	3,664
CCA	161	286	124	235	627	924	1,291	1,090	1,661
ESP	455	383	449	420	440	480	602	644	603
Total	2,014	1,803	1,910	1,590	2,501	3,472	4,954	5,238	5,928

Table 3 shows the contribution of internal resources, imports, CAM, RMR, LCR and DR towards meeting RA requirements by LSE type. On aggregate, LSEs have met RA requirements in most months, though there was an approximately 500 MW cumulative deficiency in September resulting from the five LSE month ahead system deficiencies described in Section 4.

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Table 3: Resource Types Used to Meet System Requirements on Monthly RA Plans

LSE Type	Resource Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
All	Internal Resources	22,836	21,836	21,311	23,913	26,575	32,273	31,821	32,798	32,081
		69%	68%	67%	70%	70%	71%	69%	69%	68%
	Imports	2,014	1,803	1,910	1,590	2,501	3,472	4,954	5,238	5,928
		6%	6%	6%	5%	7%	8%	11%	11%	13%
	CAM/RMR/ LCR Credit	7,496	7,563	7,535	7,553	7,561	7,970	7,882	7,919	7,830
		23%	24%	24%	22%	20%	18%	17%	17%	17%
	DR Credit	937	972	989	1,182	1,335	1,514	1,585	1,612	1,549
		3%	3%	3%	3%	4%	3%	3%	3%	3%
	Total	33,283	32,175	31,744	34,238	37,972	45,229	46,242	47,567	47,389
		100%	100%	100%	100%	100%	100%	100%	100%	100%
CPUC RA Requirement	30,953	30,827	30,032	32,928	36,803	44,540	45,992	47,176	47,881	
% Shown	108%	104%	106%	104%	103%	102%	101%	101%	99%	
IOU	Internal Resources	15,352	14,198	14,156	15,548	17,617	21,067	21,869	22,332	21,645
		66%	66%	66%	69%	70%	71%	69%	68%	68%
	Imports	1,398	1,134	1,337	935	1,434	2,068	3,061	3,505	3,664
		6%	5%	6%	4%	6%	7%	10%	11%	12%
	CAM/RMR/ LCR Credit	5,714	5,379	5,322	5,252	5,137	5,482	5,703	5,727	5,421
		25%	25%	25%	23%	20%	18%	18%	18%	17%
	DR Credit	744	716	722	858	917	1,024	1,135	1,163	1,065
		3%	3%	3%	4%	4%	3%	4%	4%	3%
	Total	23,208	21,428	21,537	22,593	25,105	29,640	31,768	32,727	31,795
		100%	100%	100%	100%	100%	100%	100%	100%	100%
IOU RA Requirement	22,420	20,623	20,590	21,942	24,317	29,128	31,604	32,528	31,689	
% Shown	104%	104%	105%	103%	103%	102%	101%	101%	100%	
CCA	Internal Resources	5,378	5,426	5,014	5,808	6,388	8,188	7,159	7,701	7,297
		81%	75%	75%	76%	72%	74%	70%	73%	67%
	Imports	161	286	124	235	627	924	1,291	1,090	1,661
		2%	4%	2%	3%	7%	8%	13%	10%	15%
	CAM/RMR/ LCR Credit	982	1,317	1,342	1,400	1,577	1,652	1,449	1,496	1,624
		15%	18%	20%	18%	18%	15%	14%	14%	15%
	DR Credit	104	158	166	199	288	349	320	324	339
		2%	2%	2%	3%	3%	3%	3%	3%	3%
Total	6,626	7,187	6,646	7,641	8,880	11,113	10,219	10,610	10,921	
	100%	100%	100%	100%	100%	100%	100%	100%	100%	
CCA RA Requirement	5,431	6,913	6,111	7,291	8,700	11,056	10,309	10,538	11,577	

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	% Shown	122%	104%	109%	105%	102%	101%	99%	101%	94%
ESP	Internal Resources	2,105	2,212	2,140	2,557	2,570	3,018	2,793	2,765	3,139
		61%	62%	60%	64%	64%	67%	66%	65%	67%
	Imports	455	383	449	420	440	480	602	644	603
		13%	11%	13%	10%	11%	11%	14%	15%	13%
	CAM/RMR/ LCR Credit	800	867	871	901	847	836	730	696	785
		23%	24%	24%	23%	21%	19%	17%	16%	17%
	DR Credit	89	98	101	125	130	142	130	125	146
		3%	3%	3%	3%	3%	3%	3%	3%	3%
	Total	3,449	3,560	3,561	4,004	3,987	4,477	4,255	4,230	4,673
		100%	100%	100%	100%	100%	100%	100%	100%	100%
ESP RA Requirement	3,102	3,291	3,331	3,695	3,786	4,355	4,079	4,110	4,615	
% Shown	111%	108%	107%	108%	105%	103%	104%	103%	101%	

Since local RA requirements are based on a study of peak August load by the CAISO but applied to each month of the year, CPUC has adopted rules to count local resources at their August NQC values for all months when evaluating compliance with local requirements. Therefore, Table 1 uses monthly values for resources with NQC values that vary, while Table 4 employs the CPUC counting convention of counting local resources at their August NQC values for all months in presenting similar information on resources procured to meet local RA requirements.

Table 4: Resources Shown on Month Ahead Local RA Plans by LSE Type (MW)

LSE Type	Resource Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
All	Battery Storage	83	80	80	80	83	82	83	83	83
	Biogas & Biomass	133	163	148	122	148	166	157	156	135
	CHP	954	873	1,029	984	1,159	1,165	1,171	1,151	1,152
	Geothermal	474	482	453	427	431	472	467	423	420
	Hydro	1,690	1,841	2,219	1,959	1,985	2,379	2,383	2,208	2,106
	Natural Gas	16,146	16,084	15,590	15,493	15,927	15,975	16,032	16,959	16,475
	Pumped Hydro	1,256	1,258	883	976	1,258	1,223	1,258	1,231	1,258
	Solar	606	823	667	772	814	895	904	908	890
	Wind	440	452	446	480	464	508	475	469	469
	DR Credit	1,190	1,190	1,190	1,190	1,190	1,190	1,190	1,190	1,190
	RMR/LCR/DRA M	499	499	499	522	522	522	522	522	522
	Total	23,471	23,746	23,203	23,005	23,982	24,576	24,642	25,299	24,699
	CPUC Requirement	22,104	21,931	21,936	21,972	22,376	22,254	22,733	22,733	22,733
% of Requirement	106%	108%	106%	105%	107%	110%	108%	111%	109%	
IOU	Battery Storage	4				4		4	3	3
	Biogas & Biomass	53	52	53	54	67	80	83	59	60
	CHP	407	195	405	187	375	456	411	407	458
	Geothermal	250	250	250	250	250	250	250	250	250
	Hydro	866	1,263	1,375	1,396	1,094	1,560	1,413	1,374	1,417
	Natural Gas	8,400	7,832	7,037	7,720	7,788	7,580	7,925	8,168	7,820
	Pumped Hydro	919	1,133	744	259	1,140	1,114	1,190	1,040	885
	Solar	416	622	502	514	476	608	655	552	657
	Wind	359	359	359	333	359	359	359	359	359
	Total	11,675	11,706	10,726	10,715	11,552	12,006	12,291	12,212	11,909
CCA	Biogas & Biomass	66	98	60	41	67	77	54	75	65
	CHP	47	228	1	112	80	1	48	22	
	Geothermal	139	150	137	118	120	159	159	115	108
	Hydro	758	529	777	498	812	761	874	791	546
	Natural Gas	1,975	1,953	2,144	1,750	1,849	2,065	1,916	1,987	1,879
	Pumped Hydro	306	85	136	650	85	91		191	338
	Solar	65	75	91	160	226	200	145	195	94
	Wind	38	44	37	87	58	76	57	54	54
Total	3,393	3,163	3,385	3,417	3,298	3,429	3,253	3,429	3,084	

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LSE Type	Resource Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
ESP	Battery Storage						2			
	Biogas & Biomass	14	14	34	27	14	10	20	22	10
	CHP	13	47	12	12	9	13	17	44	11
	Geothermal	85	82	66	59	61	63	58	58	62
	Hydro	66	48	68	65	79	58	95	43	143
	Natural Gas	1,400	1,414	1,426	1,378	1,391	1,431	1,292	1,378	1,329
	Pumped Hydro	31	40	2	66	33	19	68		35
	Solar	125	126	73	97	112	87	103	161	139
	Wind	43	49	50	60	47	73	59	56	56
	Total	1,776	1,820	1,730	1,763	1,747	1,757	1,712	1,762	1,785
CAM/RMR/ LCR	Battery Storage	80	80	80	80	80	80	80	80	80
	CHP	488	403	610	673	695	695	695	678	683
	Natural Gas	4,370	4,886	4,983	4,645	4,899	4,899	4,900	5,426	5,446
	DR Credit	1,190	1,190	1,190	1,190	1,190	1,190	1,190	1,190	1,190
	RMR/ LCR/ DRA M	499	499	499	522	522	522	522	522	522
	Total	6,626	7,057	7,362	7,110	7,385	7,385	7,386	7,896	7,920

Table 5 shows the same resources as Table 4, but breaks down showings by local area rather than LSE type. We see here that, despite the deficiencies described in Section 4, on aggregate, CPUC-jurisdictional LSEs have provided adequate capacity for each for all local areas except San Diego-Imperial Valley (San Diego-IV) which had deficiencies during the peak months of July through September.

Table 5: Resources Shown on Month Ahead Local RA Plans by Local Area

Local Area	Resource Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Bay Area	Battery Storage	4				4	2	4	3	3
	Biogas & Biomass	4	5	6	1	1	5	3	0	0
	CHP	236	236	233	121	230	233	232	236	233
	Natural Gas	3,926	3,768	3,863	3,819	3,835	3,842	3,758	3,715	3,750
	Solar	4	12	12	12	12	12	12	12	12
	Wind	184	185	181	191	189	193	189	188	188
	DR Credit	116	116	116	116	116	116	116	116	116
	RMR/DRAM	203	203	203	203	203	203	203	203	203
	Total	4,677	4,525	4,614	4,463	4,590	4,606	4,516	4,473	4,505
	CPUC Requirement	4,031	4,031	4,031	4,031	4,031	4,031	4,031	4,031	4,031
	% of Requirement	116%	112%	114%	111%	114%	114%	112%	111%	112%
Big Creek-Ventura	Biogas & Biomass	21	21	21	21	21	35	30	30	30
	CHP	418	333	333	394	418	418	418	413	403
	Hydro	352	437	486	377	352	352	352	352	363
	Natural Gas	1,431	1,431	1,372	1,430	1,430	1,430	1,430	1,430	1,432
	Pumped Hydro	0	0	0	0	0	0	0	0	0
	Solar	67	107	82	148	148	185	162	147	176
	DR Credit	169	169	169	169	169	169	169	169	169
	DRAM	10	10	10	10	10	10	10	10	10
	Total	2,459	2,499	2,463	2,538	2,538	2,589	2,562	2,541	2,573
	CPUC Requirement	2,390	2,390	2,390	2,390	2,390	2,390	2,390	2,390	2,390
	% of Requirement	103%	105%	103%	106%	106%	108%	107%	106%	108%
LA Basin	Battery Storage	42	42	42	42	42	42	42	42	42
	Biogas & Biomass	2	2	2	2	2	2	2	2	2
	CHP	133	133	343	343	343	343	343	328	343
	Hydro	6	3	3	1	1	7	7	7	7
	Natural Gas	6,376	6,360	6,146	6,135	6,138	6,190	6,191	7,191	6,747
	Solar	31	31	31	31	31	31	31	31	28
	Wind	131	142	141	165	151	190	162	157	157
	DR Credit	686	686	686	686	686	686	686	686	686
	LCR/DRAM	173	173	173	173	173	173	173	173	173
	Total	7,580	7,572	7,567	7,578	7,567	7,664	7,637	8,617	8,184
	CPUC Requirement	7,417	7,417	7,417	7,417	7,417	7,417	7,417	7,417	7,417
% of Requirement	102%	102%	102%	102%	102%	103%	103%	116%	110%	
Other PG&E Areas	Biogas & Biomass	97	127	110	90	118	119	116	117	96
	CHP	162	166	114	122	163	166	166	166	166
	Geothermal	474	482	453	427	431	472	467	423	420
	Hydro	1,332	1,401	1,730	1,582	1,632	2,020	2,024	1,849	1,736

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Local Area	Resource Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
	Natural Gas	1,437	1,521	1,315	1,328	1,380	1,489	1,413	1,382	1,315
	Pumped Hydro	1,216	1,218	843	936	1,218	1,183	1,218	1,191	1,218
	Solar	176	345	214	253	296	339	371	390	346
	DR Credit	184	184	184	184	184	184	184	184	184
	RMR/DRAM	101	101	101	101	101	101	101	101	101
	Total	5,179	5,545	5,065	5,023	5,522	6,073	6,060	5,804	5,583
	CPUC Requirement	4,868	4,868	4,868	4,868	4,868	4,868	4,868	4,868	4,868
	% of Requirement	106%	114%	104%	103%	113%	125%	124%	119%	115%
San Diego-IV ⁴	Battery Storage	38	38	38	38	38	38	38	38	38
	Biogas & Biomass	9	9	9	9	7	7	7	7	7
	CHP	5	5	5	5	5	5	11	7	7
	Natural Gas	2,975	3,005	2,894	2,780	3,144	3,023	3,240	3,241	3,231
	Pumped Hydro	40	40	40	40	40	40	40	40	40
	Solar	328	328	328	328	328	328	328	328	328
	Wind	125	125	125	125	125	125	125	125	125
	DR Credit	34	34	34	34	34	34	34	34	34
	DRAM	12	12	12	35	35	35	35	35	35
	Total	3,566	3,595	3,485	3,394	3,755	3,634	3,857	3,855	3,844
	CPUC Requirement	3,398	3,225	3,230	3,266	3,670	3,548	4,027	4,027	4,027
	% of Requirement	105%	111%	108%	104%	102%	102%	96%	96%	95%

⁴ The San Diego-IV requirement varies by month because CPUC caps LSE local requirements at their system requirement.

3 DEVELOPMENT OF PREFERRED RESOURCES IN LOCAL AND SYSTEM AREAS

From January 2018 through July 2019, 463.35 MW of August capacity from new preferred resources was added to the Net Qualifying Capacity (NQC) List (Table 6). Resources must be on the NQC list in order to be counted for RA. Of the 463.35 MW, 293.68, or 63%, are system resources, while 167.17 MW were developed in local areas. This includes, 87.23 MW in the San Diego-IV local area, 49.20 MW in Big Creek-Ventura, 23.16 MW in Fresno, and 10.08 MW in Kern. While one small project came online in the Los Angeles (LA) Basin, it is currently an energy only resource so has no RA value. No new preferred generators came online in the Bay Area, Humboldt, Sierra, or North Coast/North Bay local areas during this time period.

Of the new resources, 293.24 MW or 63% are contracted with IOUs. 75.8 MW (16%) are contracted with CCAs and 94.31 MW (20%) are contracted with ESPs. For comparison, 2019 load shares for local requirements for the second half of 2019 are 72% IOU, 18% CCA, and 10% ESP and the total 2019 local requirement for CPUC jurisdictional LSEs is 23,588 MW.

Table 6: New Preferred Resources on NQC List 2018-July 2019.

Local Area	LSE Type	Resource ID	Resource Name	Technology	Aug NQC	Net Dependable Capacity
Big Creek-Ventura	IOU	DELSUR_6_BSOLAR	Central Antelope Dry Ranch B	Solar PV	1.23	3.00
		LITLRK_6_GBCSR1	Green Beanworks C	Solar PV	1.23	3.00
		OASIS_6_GBDSR4	Green Beanworks D	Solar PV	1.23	3.00
		PIUTE_6_GNBSR1	Green Beanworks B	Solar PV	1.23	3.00
		REDMAN_6_AVSSR1	Antelope Valley Solar	Solar PV	1.23	3.00
		RECTOR_2_TFDBM1	Two Fiets Dairy Digester	Biogas	0.00	0.80
	CCA	BGSKYN_2_AS2SR1	Antelope Solar 2	Solar PV	43.05	105.00
			Total	49.20	120.80	
Fresno	IOU	DAIRLD_1_MD1SL1	Madera 1	Solar PV	0.00	1.50
		ORTGA_6_ME1SL1	Merced 1	Solar PV	0.00	3.00
		SUMWHT_6_SWSSR1	Summer Wheat Solar Farm	Solar PV	7.58	18.50
	CCA	TRNQL8_2_ROJSR1	Tranquillity 8 Rojo	Solar PV	15.58	100.00

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Local Area	LSE Type	Resource ID	Resource Name	Technology	Aug NQC	Net Dependable Capacity
	Muni	TRNQL8_2_VERSR1	Tranquillity 8 Verde	Solar PV	0.00	60.00
				Total	23.16	183.00
Kern	IOU	LAMONT_1_SOLAR2	Redwood Solar Farm 4	Solar PV	8.20	20.00
		OLDRIV_6_CESDBM	CES Dairy Biogas	Biogas	0.94	1.00
		OLDRIV_6_LKVBM1	Lakeview Dairy Biogas	Biogas	0.94	1.00
				Total	10.08	22.00
LA Basin	IOU	DEVERS_2_CS2SR4	Caliente Solar 2	Solar PV	0.00	0.91
				Total	0.00	0.91
San Diego-IV	IOU	CRELMN_6_RAMSR3	Ramona Solar Energy	Solar PV	1.42	4.32
		TULEWD_1_TULWD1	Tule Wind	Wind	33.81	127.60
		WISTRA_2_WRSSR1	Wistaria Ranch Solar	Solar PV	41.00	100.00
		PRCTVY_1_MIGBT1	Miguel BESS	Energy Storage	0.00	2.00
	ESP	VSTAES_6_VESBT1	Vista Energy Storage	Energy Storage	11.00	40.00
				Total	87.23	273.92
CAISO System	IOU	CALFTS_2_CFSSR1	California Flats Solar South	Solar PV	61.50	150.00
		FRNTBW_6_SOLAR1	Frontier Solar	Solar PV	8.20	20.00
		GANSO_1_WSTBM1	Weststar Dairy Biogas	Biogas	0.00	1.00
		GASKW1_2_GW1SR1	Gaskell West 1	Solar PV	8.20	20.00
		PNCHVS_2_SOLAR	Panoche Valley Solar	Solar PV	62.00	140.00
		RATSKE_2_NROSR1	North Rosamond Solar	Solar PV	61.50	150.00
	CCA	VOYAGR_2_VOYWD3	Voyager Wind 3	Wind	11.45	43.20
		VOYAGR_2_VOYWD4	Voyager Wind 4	Wind	5.72	21.60
	ESP	DSFLWR_2_WS2SR1	Willow Springs 2	Solar PV	41.00	100.00
		VOYAGR_2_VOYWD2	Voyager Wind 2	Wind	34.11	128.70
				Total	293.68	774.50
			Grand Total	463.35	1,375.13	

4 LOCAL, SYSTEM AND FLEXIBLE RA DEFICIENCIES

On October 31, 2018, 10 LSEs, out of a total of 36 Commission-jurisdictional LSEs, submitted local waiver requests due to their inability to procure sufficient capacity in one or more local areas to meet their 2019 year ahead local RA requirements. These LSEs include:

- one IOU (San Diego Gas & Electric Company (SDG&E));
- six CCAs (East Bay Community Energy, Monterey Bay Community Power Authority, Peninsula Clean Energy Authority, San Jose Clean Energy, Sonoma Clean Power Authority, and Valley Clean Energy Authority); and
- three ESPs (Constellation NewEnergy, Inc., Direct Energy Business, and Just Energy Solutions, Inc.). Additionally, a fourth ESP, Commercial Energy of Montana, was found to have a local deficiency but did not file a waiver.

This is not the first year that numerous LSEs have experienced difficulty procuring local capacity – but the underlying facts differ significantly this year. In 2018, most individual local deficiencies were concentrated in the San Diego-IV local area and were a result of LSEs’ inability to contract with Encina Generating Station due to its stated intent to retire at the end of 2017 in compliance with State Water Board once-through-cooling requirements. For 2019, local deficiencies were much more dispersed with deficiencies in the Other PG&E, Bay Area, LA Basin, and San Diego-IV local areas.

In local waiver requests LSEs cited several reasons for their deficiencies. All issued Requests for Offers (RFOs) and bid into RFOs issued by other entities. While some were able to procure capacity, none received enough to meet local RA requirements at prices they deemed reasonable. While some LSEs rejected offers they considered too high, many were unable to procure capacity even when prices well above the local trigger price of \$40/kw-year were offered. LSEs also contacted generators, brokers, and other LSEs bilaterally, but were unable to identify sufficient available capacity to meet their requirements.

Specific local deficiencies are detailed in Table 7. Despite these deficiencies, CAISO determined that there were no aggregate deficiencies in the SCE and SDG&E TAC areas.

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The Humbolt, Sierra, North Coast/North Bay, Stockton, and Fresno local areas are aggregated into the Other Pacific Gas & Electric (PG&E) area for CPUC compliance purposes. Despite collective deficiencies in several of these local areas, CAISO performed no backstop procurement.⁵

Table 7: Year Ahead Local Deficiencies

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bay Area	MW	1.92	69.87	3.85	1.92	4.87	1.92	1.92	1.92	22.87	8.87	0	1.92
	# of LSEs	1	2	2	1	2	1	1	1	2	2	0	1
Other PG&E	MW	27.77	169.09	7.09	10.69	130.77	44.81	192.96	30.96	338.65	205.73	108.25	145.45
	# of LSEs	5	4	3	2	6	5	7	4	9	7	7	8
LA Basin	MW	1.24	1.24	1.24	1.24	1.24	2.12	2.12	2.12	2.12	2.12	2.12	2.12
	# of LSEs	1	1	1	1	1	2	2	2	2	2	2	2
San Diego-IV	MW	0	0	0	17.29	0	255.24	255.02	255.24	255.57	97.79	0	0
	# of LSEs	0	0	0	1	0	1	1	1	1	1	0	0

The year ahead local deficiencies have generally persisted in month ahead filings, though some LSEs were able to cure their deficiencies in certain months. Additionally, a small deficiency occurred in Big Creek/Ventura for July that had not previously been present. Table 8 shows local deficiencies on month ahead showings from January through September.

⁵ See

http://www.caiso.com/Documents/EvaluationReport_LoadServingEntitiesCompliance_2019Local_SystemResourceAdequacyRequirements.pdf.

Table 8: Month Ahead Local Deficiencies

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Bay Area	MW	1.92	62.95	0	1.92	0	0	1.92	1.92	3.87
	# of LSEs	1	1	0	1	0	0	1	1	2
Other PG&E	MW	19.56	163.77	0.89	0.89	89.65	32.09	126.65	3.77	282.43
	# of LSEs	3	3	1	1	4	3	4	2	6
LA Basin	MW	1.24	1.24	1.24	0	0	2.12	1.24	1.24	2.12
	# of LSEs	1	1	1	0	0	2	1	1	2
Big Creek/Ventura	MW	0	0	0	0	0	0	0.81	0	0
	# of LSEs	0	0	0	0	0	0	1	0	0
San Diego/IV	MW	0	0	0	0	0	0	239.02	239.24	249.58
	# of LSEs	0	0	0	0	0	0	1	1	1

Table 9 shows system RA deficiencies in the year ahead (YA) and month ahead (MA) filings. YA filings cover only the five summer months (May through September) so there were no deficiencies for January to April in the YA timeframe. Even in the MA timeframe, deficiencies were minimal in those months. Larger deficiencies have been seen on the system level for the peak summer months, particularly July and September. While deficiencies were cured to some extent between the YA and MA filings, collective deficiencies of 159.15 MW for July and 847.02 MW for August for CPUC jurisdictional LSEs. A similar trend was seen for flexible deficiencies with a 114.1 MW deficiency remaining for September in the MA filing (Table 10).

Table 9: Year Ahead and Month Ahead System Deficiencies

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
YA	MW	NA	NA	NA	NA	5.49	23.25	528.12	35.80	979.21
	# of LSEs	NA	NA	NA	NA	1	3	5	4	6
MA	MW	1.8	2.45	0	0.6	6.86	20.8	159.15	27.8	847.02
	# of LSEs	1	1	0	1	2	2	4	3	5

Table 10: Year Ahead and Month Ahead Flexible Deficiencies

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
YA	MW	8	9	2	2	2	5	36.1	3	130.1
	# of LSEs	2	2	1	1	1	3	2	1	5
MA	MW	3	0	2	2	0	2	1	3	114.1
	# of LSEs	2	0	1	1	0	1	1	1	4

5 RESOURCES NOT SHOWN IN RA FILINGS

Table 11 shows the amount of capacity listed on the 2019 NQC list that was not shown on January through December MA supply plans submitted to the CAISO on behalf of both CPUC jurisdictional and non-jurisdictional LSEs. To calculate the remaining capacity, we subtract the capacity shown by CPUC jurisdictional LSEs on RA plans and by non-jurisdictional LSEs on supply plans submitted to CAISO from total NQC values listed on the July 2019 version of the NQC list posted to the CAISO website.⁶ Note that due to outages and mid-year adjustment of NQC values the amount of remaining capacity in this analysis is larger than the amount available earlier in the year.

A significant portion of the capacity not listed appears to be due to outages which were therefore not available to provide RA capacity. For example, on the peak day of March (March 6, 2019), there were 116 planned outages and 237 forced outages in CAISO and on the peak load day in July (July 24, 2019) there were 76 planned outages and 323 forced outages in CAISO.⁷ While some of the additional capacity that was not shown may actually be unavailable for reasons such as water limitations on hydro resources, and market conditions are tight, there appears to be some unused capacity in the system.

⁶ See <http://www.caiso.com/planning/Pages/ReliabilityRequirements/Default.aspx>.

⁷ See <http://www.caiso.com/market/Pages/OutageManagement/UnitStatus.aspx> for outage figures.

Table 11: Resources not Shown on Month Ahead RA Filings January-September 2019

LSE Type	Resource Type	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
All	Battery Storage	11	15	17	17	15	17	17	3	4
	Biogas & Biomass	272	297	328	263	282	207	246	246	208
	CDWR Pumps	443	443	442	443	443	443	443	443	443
	CHP	229	280	289	258	315	190	331	208	180
	Geothermal	86	91	121	142	126	206	210	252	253
	Hydro	2,803	3,103	2,505	2,690	2,677	1,432	1,687	1,637	1,626
	Natural Gas	6,726	7,727	8,793	8,642	8,005	5,673	4,804	3,485	3,336
	Nuclear	1,057	1,244	1,566	1,160	15	34	15	34	38
	Pumped Hydro	302	331	679	673	204	207	74	74	73
	Solar	9	66	320	817	642	82	152	97	69
	Wind	121	213	196	323	173	306	180	149	138
	Total		12,059	13,809	15,255	15,428	12,897	8,797	8,159	6,627

Table 12 provides the amount of capacity on planned outage during the peak load days in March and July by resource type. Of the 15,255 MW not shown in March, 5,828.7 was on planned outage. Another 2,667.8 MW was on forced outage on March 6. On July 24, 1,021.58 MW was on planned outage and 4,484.22 MW on forced outage.

Table 12: Planned Outages on Peak Load Days in March and July 2019

		6-Mar	24-Jul
All	Biogas & Biomass	55.4	0
	CHP	85	32.6
	Hydro	1,740.75	633.65
	Geothermal	0	47.1
	Natural Gas	1,710.81	127.2
	Nuclear	1150	0
	Pumped Hydro	461.43	124.43
	Solar	416.5	0
	Wind	208.8	56.6
	Total	5,828.69	1,021.58

In addition to the internal resources listed above, Table 13 shows the unused maximum import capability (MIC) for each month of 2019 after imports of both CPUC jurisdictional and non-jurisdictional LSEs are accounted for. For September, which is forecast to be the peak load month of 2019, 2,685 MW of MIC were unused.

Table 13: Remaining Import Capability

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Total MIC	10,193	10,193	10,193	10,193	10,193	10,193	10,193	10,193	10,193
CPUC Imports on RA Plans	2,014	1,803	1,910	1,590	2,501	3,472	4,954	5,238	5,928
Non-CPUC Imports on Supply Plans	1,017	875	979	864	1,060	1,293	1,367	1,362	1,580
Remaining MIC	7,161	7,515	7,304	7,738	6,632	5,429	3,873	3,593	2,685

6 CONCLUSION

Overall, this analysis indicates that the RA market is tight. As described in Section 4, 11 LSEs had year ahead local deficiencies, six LSEs had year ahead system deficiencies, and five LSEs had year ahead flexible deficiencies, many of which have persisted through the year in month ahead filings. Additionally, in local waiver requests, some LSEs reported being unable to identify available capacity at any price. September, the forecasted peak load month of 2019, proved to be the most challenging. Five LSEs had September 2019 deficiencies for a total of 847.02 MW resulting in a cumulative deficiency for CPUC jurisdictional LSEs for the first time.

However, there does appear to be unused capacity in the system. 6,348 MW of unused capacity was listed on the NQC list for September. While not all of this capacity was available due to retirements, water limitations, etc., there was likely significantly more than 850 MW that was physically available. Additionally, while a higher than normal amount of imports were shown for RA in September, 2,685 MW of MIC went unused.

Although it appears that there is currently sufficient capacity on the system, and compliance with RA requirements is possible, we can expect that the market will continue to tighten. Only 463 MW of new preferred resources came online during the 17 months from January 2018 through July 2019, significantly less than the capacity retired during that period. Additionally, nearly 2,000 MW of solar and wind capacity will be lost between 2019 and 2020 due to declining ELCC values and several thousand MW of once-through-cooling generators are slated to retire over the coming years. As we move forward, it will be important to ensure that adequate resources are available to maintain a robust system.