

April 1, 2022

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: California Independent System Operator Corporation
Docket No. ER15-861-____
Energy Imbalance Market – Fourth Quarter 2021
Available Balancing Capacity Report**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) hereby submits its quarterly informational report for the fourth quarter of 2021 (October 1 to December 31, 2021) on the Available Balancing Capacity (ABC) enhancement for the Western Energy Imbalance Market (WEIM). The quarterly informational report is to provide the Commission with information on the performance of the ABC enhancement and to provide the same information the CAISO provides in its monthly informational reports submitted during an EIM Entity's first six-month transition period.

Consistent with the Commission's directive in the December 17, 2015 order, the CAISO will continue to file such quarterly reports for at least the first year after implementation of the ABC enhancement, or until the Commission finds the quarterly informational reports are no longer needed.

Please contact the undersigned with any questions.

Respectfully submitted

By: /s/ John Anders

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California ISO

Western Energy Imbalance Market

October 1 – December 31, 2021

Available Balancing Capacity Report

March 18, 2022

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I. Background

On December 17, 2015, the Federal Energy Regulatory Commission (Commission) approved the California Independent System Operator Corporation's (CAISO) proposed tariff revisions to comply with the Commission's July 20, 2015 order in FERC Docket No. ER15-861-006.¹ The CAISO's proposed tariff provisions enhanced the Western Energy Imbalance Market (WEIM) functionality so that the market systems automatically recognize and account for capacity an EIM Entity has available to maintain reliable operations in its own balancing authority area (BAA), but has not been bid into the WEIM.² This enhancement is referred to as the Available Balancing Capacity (ABC) enhancement. The CAISO implemented the ABC enhancement on March 23, 2016.

Consistent with the CAISO's commitments made in this proceeding, the Commission directed the CAISO to prepare and file with the Commission quarterly informational reports for at least the first year after implementation of the ABC enhancement, and until the Commission finds the quarterly informational reports are no longer needed.³ The quarterly informational reports are to provide information on the performance of the ABC enhancement and to include the same information the CAISO provides in its monthly informational reports submitted during an EIM Entity's first six-month transition period.⁴

¹ *Cal. Indep. Sys. Operator Corp.*, 152 FERC ¶ 61,060 (2015) (July 20 Order); and *Cal. Indep. Sys. Operator Corp.*, 153 FERC ¶ 61, 305 (2015) (December 17 Order).

² December 17 Order at P 1.

³ December 17 Order at P 99.

⁴ December 17 Order at P 39.

II. Available Balancing Capacity

A. ABC Submitted to the Market

Each EIM Entity can identify and choose the amount of Available Balancing Capacity (ABC) they will make available to the CAISO and the resources supporting this capacity through its resource plan. The EIM Entity submits this capacity to the CAISO on an hourly basis, and it is available for both the Fifteen-Minute Market (FMM) and the five-minute Real-Time Dispatch (RTD). The data in this section shows the ABC bid into, and awarded by, the market in each of the WEIM BAAs for each month within the quarter.

The table below summarizes the percentage of hours in which each EIM Entity submitted upward and downward ABC bids to the WEIM for each month within the quarter. Balancing Authority of Northern California (BANC) and Turlock Irrigation District (TIDC) submitted ABC for nearly all intervals in each month. Idaho Power Company (IPCO) and Puget Sound Energy (PSEI) did not submit any ABC to the WEIM during the quarter.

Table 1: Frequency of ABC Submitted to the WEIM

BAA	October 2021		November 2021		December 2021	
	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity
AZPS	99.60%	98.25%	98.20%	94.87%	97.72%	98.12%
BANC	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
BCHA	99.19%	100.00%	98.47%	100.00%	98.25%	100.00%
IPCO	--	--	--	--	--	--
LADWP	42.88%	6.05%	39.81%	2.50%	38.71%	2.55%
NEVP	99.19%	98.93%	99.45%	97.92%	98.93%	98.25%
NWMT	97.98%	86.16%	99.45%	89.18%	93.95%	94.76%
PACE	25.40%	11.69%	9.71%	8.18%	9.95%	6.59%
PACW	3.23%	5.24%	--	3.19%	1.61%	18.82%
PGE	98.93%	--	99.17%	--	98.93%	--
PNM	61.69%	15.73%	78.23%	18.31%	78.50%	4.84%
PSEI	--	--	--	--	--	--
SCL	--	--	1.39%	--	--	--
SRP	98.93%	96.77%	99.31%	99.72%	99.60%	97.31%
TIDC	99.87%	99.19%	100.00%	100.00%	100.00%	100.00%

The table below shows the average ABC capacity, in MW, which each EIM Entity submitted to the WEIM for each month within the quarter. BCHA consistently submitted the highest average ABC capacity to the WEIM in both the upward and downward directions, while IPCO and PSEI did not submit any ABC capacity to the WEIM.

Table 2: Average ABC Capacity Submitted to the WEIM

BAA	October 2021		November 2021		December 2021	
	Upward Capacity (MW)	Downward Capacity (MW)	Upward Capacity (MW)	Downward Capacity (MW)	Upward Capacity (MW)	Downward Capacity (MW)
AZPS	20	20	20	20	20	20
BANC	19.74	44.75	22.52	45.16	19.74	41.91
BCHA	653	298.97	613.9	300	681.1	299.96
IPCO	--	--	--	--	--	--
LADWP	78.32	68.42	73.57	63.09	69.97	38.02
NEVP	24.1	32.21	24.23	32.75	23.97	28.13
NWMT	12.98	13.38	14.71	11.28	13.92	11.18
PACE	33.37	49.73	21.36	53.42	31.19	41.9
PACW	58.75	66.04	--	37.19	42.5	56.47
PGE	29.88	--	23.68	--	28.98	--
PNM	26.97	30.37	26.99	25.3	26.92	30.07
PSEI	--	--	--	--	--	--
SCL	--	--	18	--	--	--
SRP	34.96	23.68	35.35	22.47	34.11	31.9
TIDC	14.18	5	14.56	5	12.72	5

The table below shows the maximum ABC capacity, in MW, which each EIM Entity submitted to the WEIM for each month within the quarter. The highest ABC bid was submitted by BCHA in the upward direction for 1000 MW, which was consistent across all three months of the quarter.

Table 3: Maximum ABC Capacity Submitted to the WEIM

BAA	October 2021		November 2021		December 2021	
	Upward Capacity (MW)	Downward Capacity (MW)	Upward Capacity (MW)	Downward Capacity (MW)	Upward Capacity (MW)	Downward Capacity (MW)
AZPS	20	20	20	20	20	20
BANC	98	221	124	220	101	100
BCHA	1000	500	1000	500	1000	500
IPCO	--	--	--	--	--	--
LADWP	200	100	200	250	200	179
NEVP	90	40	40	40	40	40
NWMT	25	15	25	15	25	15
PACE	75	125	100	100	125	100
PACW	115	160	--	130	45	175
PGE	30	--	30	--	50	--
PNM	27	65	27	50	27	60
PSEI	--	--	--	--	--	--
SCL	--	--	25	--	--	--
SRP	100	50	100	50	100	52
TIDC	15	5	15	5	15	5

The table below shows the number of different resources supporting the ABC that the EIM Entities bid into the WEIM in both the upward and downward directions, for each month within the quarter. A maximum of 19 resources supported upward ABC capacity bids in October 2021, submitted by Salt River Project (SRP). Some entities used as few as one resource to support their ABC bids.

Table 4: Number of Resources Supporting ABC

BAA	October 2021		November 2021		December 2021	
	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity
AZPS	4	4	5	6	5	5
BANC	14	12	15	13	15	15
BCHA	2	2	2	2	2	2
IPCO	--	--	--	--	--	--
LADWP	5	5	2	7	7	4
NEVP	11	10	9	8	11	11
NWMT	3	3	2	2	3	3
PACE	6	2	5	3	6	3
PACW	2	3	--	2	2	2
PGE	4	--	4	--	4	--
PNM	1	6	1	6	3	6
PSEI	--	--	--	--	--	--
SCL	--	--	1	--	--	--
SRP	19	13	16	15	15	15
TIDC	3	3	2	2	2	2

B. ABC Awarded by the Market

The table below shows the frequency of each EIM Entities' dispatched ABC for the FMM market, when the EIM Entities made ABC available, for each month within the quarter. Overall, the market dispatched ABC quite infrequently throughout the quarter. The highest frequency of ABC dispatch in FMM occurred in October 2021 on NWMT's bid-in upward ABC capacity. Often, the market dispatched ABC less than 1 percent of the time during the month.

Table 5: Frequency of ABC Dispatched by WEIM in the FMM

BAA	October 2021		November 2021		December 2021	
	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity
AZPS	--	--	0.04%	0.24%	--	0.07%
BANC	--	--	--	0.04%	--	--
BCHA	0.10%	0.07%	--	--	0.03%	--
IPCO	--	--	--	--	--	--
LADWP	--	--	--	--	--	--
NEVP	0.30%	0.17%	0.04%	0.59%	0.03%	0.54%
NWMT	2.25%	0.13%	--	0.04%	0.07%	--
PACE	--	--	--	--	--	--
PACW	--	--	--	--	--	--
PGE	--	--	--	--	0.03%	--
PNM	--	0.10%	0.07%	0.21%	0.10%	--
PSEI	--	--	--	--	--	--
SCL	--	--	--	--	--	--
SRP	1.31%	1.21%	1.35%	0.14%	1.01%	1.68%
TIDC	0.03%	0.27%	--	0.07%	--	0.03%

The table below shows the frequency of each EIM Entities' dispatched ABC for the RTD market, when the EIM Entities made ABC available, for each month within the quarter. Overall, the market dispatched ABC quite infrequently throughout the quarter. The highest frequency of ABC dispatch in RTD occurred in October 2021 on NWMT's bid-in upward ABC capacity. Often, the market dispatched ABC less than or around 1 percent of the time during the month.

Table 6: Frequency of ABC Dispatched by WEIM in the RTD

BAA	October 2021		November 2021		December 2021	
	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity
AZPS	0.09%	0.12%	0.05%	0.28%	0.10%	0.15%
BANC	0.27%	0.03%	0.07%	0.16%	0.10%	0.09%
BCHA	0.08%	0.07%	--	--	--	--
IPCO	--	--	--	--	--	--
LADWP	--	--	--	--	--	--
NEVP	0.33%	0.59%	0.05%	0.50%	0.02%	0.26%
NWMT	12.35%	0.40%	0.27%	0.05%	0.18%	0.10%
PACE	--	0.07%	--	--	--	--
PACW	--	--	--	--	--	--
PGE	0.06%	--	--	--	0.07%	--
PNM	0.02%	0.08%	0.07%	0.16%	0.08%	0.05%
PSEI	--	--	--	--	--	--
SCL	--	--	--	--	--	--
SRP	1.22%	0.97%	1.51%	0.15%	0.58%	1.89%
TIDC	0.13%	0.16%	--	0.07%	0.06%	0.06%

C. ABC and Power Balance Constraint Infeasibilities

The purpose of the ABC enhancement is to make capacity available that otherwise would not be visible to the WEIM. The primary objective in making such capacity available is that the WEIM can recognize and access that capacity when the conditions warrant its use, namely when the WEIM is running out of capacity made available through economic bids. The ABC is capacity stacked above economic bids, but below the power balance constraint relaxation penalty price. When the market is tight in supply and it has exhausted all effective economic bids, the market clearing process will access the ABC. If there is sufficient ABC, the WEIM will relax the power balance constraint to clear the market. As such, the market clearing process uses the ABC to resolve the power balance infeasibility. If instead the ABC identified is not sufficient to cure the infeasibility, the ABC may be exhausted and there may still be the need to relax the power balance constraint in order to clear the WEIM.

The table below shows the frequency of intervals in which the EIM Entities did not make any ABC available to the WEIM, when there was a power balance infeasibility for each month within the quarter, in the FMM. Specifically, the data in the table below provides the percentage amount of over-supply infeasibilities where downward ABC was needed, and under-supply infeasibilities where upward ABC was needed. No data indicates that there were no infeasibilities during the period. For example, a metric of 100 percent indicates that in all intervals when there was an infeasibility observed, the EIM Entity did not submit any ABC to the WEIM. These instances occurred relatively

infrequently throughout the quarter, indicating that the EIM Entities typically had submitted ABC bids during instances when infeasibilities were observed.

Table 7: Frequency of Power Balance Infeasibilities When no ABC was Available in FMM

BAA	October 2021		November 2021		December 2021	
	Over-supply	Under-supply	Over-supply	Under-supply	Over-supply	Under-supply
AZPS	--	--	14.29%	100.00%	0.00%	--
BANC	--	--	--	--	--	--
BCHA	--	--	--	--	--	--
IPCO	--	--	--	--	--	--
LADWP	--	100.00%	--	--	--	0.00%
NEVP	0.00%	0.00%	--	0.00%	--	--
NWMT	--	11.29%	--	0.00%	--	0.00%
PACE	--	--	--	--	--	--
PACW	--	--	--	100.00%	--	100.00%
PGE	--	--	--	--	--	0.00%
PNM	100.00%	--	100.00%	0.00%	100.00%	0.00%
PSEI	--	100.00%	--	100.00%	--	--
SCL	--	--	--	--	--	100.00%
SRP	--	--	0.00%	0.00%	33.33%	--
TIDC	50.00%	--	--	--	0.00%	--

The table below shows the frequency of intervals in which the EIM Entities did not make any ABC available to the WEIM, when there was a power balance infeasibility for each month within the quarter, in the RTD. Instances of observed infeasibilities with no submitted ABC occurred more frequently in RTD than FMM.

Table 8: Frequency of Power Balance Infeasibilities When no ABC was Available in RTD

BAA	October 2021		November 2021		December 2021	
	Over-supply	Under-supply	Over-supply	Under-supply	Over-supply	Under-supply
AZPS	33.33%	0.00%	0.00%	0.00%	0.00%	0.00%
BANC	--	--	--	--	--	--
BCHA	--	--	--	--	--	--
IPCO	--	--	--	--	100.00%	100.00%
LADWP	--	87.88%	--	--	--	33.33%
NEVP	0.00%	0.00%	0.00%	0.00%	0.00%	--
NWMT	0.00%	2.92%	0.00%	0.00%	0.00%	0.00%
PACE	--	100.00%	--	100.00%	--	100.00%
PACW	--	100.00%	100.00%	100.00%	--	100.00%
PGE	--	0.00%	--	--	--	--
PNM	100.00%	83.33%	100.00%	0.00%	100.00%	0.00%
PSEI	--	100.00%	100.00%	100.00%	--	100.00%
SCL	--	--	--	66.67%	100.00%	100.00%
SRP	0.00%	0.00%	0.00%	0.00%	15.91%	0.00%
TIDC	12.50%	0.00%	--	--	0.00%	0.00%

III. WEIM Performance

This section provides the information the CAISO previously provided in its monthly informational reports submitted during an EIM Entity's first six-month transition period.

A. ELAP Prices

The figures in this section show the WEIM load aggregation point (ELAP) prices⁵ for the FMM and RTD in each WEIM BAA. In prior reports, the CAISO provided these factual prices in comparison to counterfactual prices in order to show the effect of using the pricing waiver of the price discovery mechanism.⁶

The CAISO may correct prices posted on its Open Access Same-time Information System (OASIS) pursuant to the CAISO's price correction authority in

⁵ The ELAP provides aggregate prices that are representative of pricing in the overall BAA.

⁶ In Docket ER15-402, the CAISO reported on prices based on the price discovery mechanism in effect during the term of the Commission's waiver granted in that docket and the prices as they would be if the waiver was not in effect, *i.e.*, what prices would have been had they been on the penalty prices in the CAISO tariff. Because pricing under the waiver pricing is based on the last economic bid price signal, these prices are a proxy of what the prices would have been absent the seven category of learning curve type issues experience in that market. The difference between the counterfactual pricing and the price in effect during the term of the reports in that docket illustrated the market impact of the waiver pricing.

section 35 of the CAISO tariff, if it finds: (1) that the prices were the product of an invalid market solution; or (2) the market solution produced an invalid price due to data input failures, hardware or software failures; or (3) a result that is inconsistent with the CAISO Tariff.

The prices presented in the figures below include all prices produced by the CAISO consistent with the CAISO tariff requirements. That is, the trends below represent: (1) prices as produced in the market for which the CAISO deemed valid; (2) prices that the CAISO could and did correct pursuant to section 35; and (3) any prices the CAISO adjusted pursuant to transition period pricing reflected in section 29.27 of the CAISO tariff.

The table below shows the average ELAP prices for all EIM Entities for each month within the quarter. Prices decreased modestly moving from the fall to winter months.

Table 9: Average FMM and RTD ELAP Prices

BAA	October 2021		November 2021		December 2021	
	FMM (\$/MWh)	RTD (\$/MWh)	FMM (\$/MWh)	RTD (\$/MWh)	FMM (\$/MWh)	RTD (\$/MWh)
AZPS	42.29	37.79	39.45	35.41	40.89	36.71
BANC	71.36	66.07	56.95	53.75	60.01	54.43
BCHA	49.76	47.2	40.56	38.66	39.09	36.49
IPCO	55.18	51.88	40.43	37.9	46.46	42.77
LADWP	56.58	51.62	54.12	48.66	57.24	50.57
NEVP	45.65	40.54	39.96	36.52	44.69	40.19
NWMT	80.11	52.96	38.64	36.04	44.09	41.09
PACE	41.59	38.15	36.58	33.86	37.66	34.67
PACW	52.81	50.62	40.26	37.3	43.43	41.51
PGE	53.17	50.73	38.85	36.33	43.06	40.83
PNM	41.67	38.62	38.09	35.73	36.17	31.29
PSEI	47.78	43.75	39.4	36.15	40.6	38.81
SCL	47.57	43.72	38.75	36.44	41.21	38.78
SRP	42.07	37.21	43	39.22	37.38	33.3
TIDC	75.67	70.81	57.34	54.09	60.96	56.25

B. Balancing Test Failures

The CAISO performs the balancing test pursuant to Section 29.34(k) of the CAISO tariff. Powerex is not subject to the balancing test.

The table below shows the frequency that each EIM Entity passed the balancing test, as well as what percentage of balancing test failures were due to under-scheduling and over-scheduling, for each month within the quarter. Overall, the entities passed the balancing test at high frequencies with the exception of PNM in November 2021.

Table 10: Frequency of Passing Balancing Test

BAA	October 2021	November 2021	December 2021
AZPS	96.91%	98.75%	98.52%
BANC	98.79%	99.31%	99.73%
BCHA	--	--	--
IPCO	99.60%	99.86%	99.87%
LADWP	98.66%	99.72%	99.33%
NEVP	98.39%	98.34%	98.25%
NWMT	98.52%	98.89%	99.06%
PACE	99.60%	99.58%	98.39%
PACW	98.79%	99.45%	98.79%
PGE	99.33%	99.31%	98.66%
PNM	97.18%	94.87%	97.72%
PSEI	97.85%	98.47%	99.33%
SCL	99.73%	99.58%	99.60%
SRP	98.25%	98.75%	99.19%
TIDC	99.73%	100.00%	98.79%

The table below shows the frequency of balancing test failures due to over-scheduling and under-scheduling respectively, for each month of the quarter. Similar to the third quarter, there were more instances of infeasibilities observed during these months than other months in the year. Overall, balancing test failures were more due to under-scheduling than over-scheduling.

Table 11: Frequency of Balancing Test Failures due to Over-Scheduling and Under-Scheduling

BAA	October 2021		November 2021		December 2021	
	Over-scheduling	Under-Scheduling	Over-scheduling	Under-Scheduling	Over-scheduling	Under-Scheduling
AZPS	21.74%	78.26%	22.22%	77.78%	9.09%	90.91%
BANC	33.33%	66.67%	20.00%	80.00%	--	100.00%
BCHA	--	--	--	--	--	--
IPCO	33.33%	66.67%	100.00%	--	--	100.00%
LADWP	40.00%	60.00%	100.00%	--	100.00%	--
NEVP	50.00%	50.00%	66.67%	33.33%	69.23%	30.77%
NWMT	45.45%	54.55%	62.50%	37.50%	14.29%	85.71%
PACE	100.00%	--	33.33%	66.67%	66.67%	33.33%
PACW	55.56%	44.44%	--	100.00%	55.56%	44.44%
PGE	60.00%	40.00%	40.00%	60.00%	50.00%	50.00%
PNM	33.33%	66.67%	51.35%	48.65%	58.82%	41.18%
PSEI	25.00%	75.00%	54.55%	45.45%	20.00%	80.00%
SCL	50.00%	50.00%	--	100.00%	--	100.00%
SRP	30.77%	69.23%	22.22%	77.78%	33.33%	66.67%
TIDC	100.00%	--	--	--	33.33%	66.67%

C. Flexible Ramp Sufficiency Test Failures

The table below shows the frequency that each EIM Entity passed the flexible ramping sufficiency test in the upward and downward directions, for each month within the quarter. Generally, the entities passed the flexible ramp sufficiency test very frequently throughout the months in the quarter.

Table 12: Frequency of Passing Flexible Ramping Sufficiency Test

BAA	October 2021		November 2021		December 2021	
	Upward Direction	Downward Direction	Upward Direction	Downward Direction	Upward Direction	Downward Direction
AZPS	100.00%	99.90%	99.65%	99.48%	99.97%	99.63%
BANC	100.00%	100.00%	100.00%	100.00%	100.00%	99.87%
BCHA	99.76%	99.60%	99.83%	99.97%	99.73%	99.87%
IPCO	100.00%	100.00%	100.00%	99.72%	99.97%	99.97%
LADWP	99.97%	99.93%	99.97%	100.00%	99.66%	100.00%
NEVP	99.73%	98.86%	99.97%	99.62%	99.97%	99.56%
NWMT	91.70%	97.72%	99.51%	99.86%	99.53%	99.97%
PACE	100.00%	100.00%	99.93%	100.00%	99.97%	100.00%
PACW	100.00%	100.00%	99.45%	99.97%	99.76%	100.00%
PGE	99.97%	100.00%	100.00%	100.00%	99.83%	100.00%
PNM	100.00%	99.63%	99.93%	99.31%	100.00%	99.87%
PSEI	100.00%	100.00%	99.93%	99.97%	100.00%	100.00%
SCL	100.00%	100.00%	100.00%	99.97%	100.00%	99.97%
SRP	99.83%	99.93%	98.75%	99.97%	99.97%	99.93%
TIDC	99.83%	99.40%	100.00%	99.90%	100.00%	99.83%

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service list in the above-referenced proceeding, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California, this 1st day of April 2022.

/s/ Jacqueline Meredith

Jacqueline Meredith