

May 2, 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-

Western Energy Imbalance Market – First Quarter 2022

**Available Balancing Capacity Report** 

#### Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) hereby submits its quarterly informational report for the first quarter of 2022 (January 1 to March 31, 2022) 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 a WEIM 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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# Western Energy Imbalance Market January 1 – March 31, 2022 Available Balancing Capacity Report

April 20, 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.<sup>1</sup> 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 a WEIM entity has available to maintain reliable operations in its own balancing authority area (BAA), but has not been bid into the WEIM.<sup>2</sup> 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.<sup>3</sup> 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 a WEIM entity's first sixmonth transition period.<sup>4</sup>

<sup>&</sup>lt;sup>1</sup> 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).

December 17 Order at P 1.

<sup>&</sup>lt;sup>3</sup> December 17 Order at P 99

<sup>&</sup>lt;sup>4</sup> December 17 Order at P 39.

## II. Available Balancing Capacity

#### A. ABC Submitted to the Market

Each WEIM 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 WEIM 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.

On March 2, 2022, Avista Utilities (AVA) and Tacoma Power (TPWR) joined the WEIM; data for January and February 2022 does not exist for these entities because they had not yet joined the WEIM.

The table below summarizes the percentage of hours in which each WEIM entity submitted upward and downward ABC bids to the WEIM for each month within the quarter. Many entities submitted ABC for nearly all intervals in each month. Idaho Power Company (IPCO) and Seattle City Light (SCL) did not submit any ABC to the WEIM during the quarter.

	Janua	ry 2022	Februa	ry 2022	Marcl	า 2022
BAA	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity
AVA					94.75%	94.89%
AZPS	96.64%	91.00%	98.51%	97.77%	96.23%	92.60%
BANC	99.87%	99.87%	100.00%	100.00%	100.00%	100.00%
BCHA	97.85%	99.87%	98.21%	100.00%	98.92%	100.00%
IPCO						
LADWP	39.65%	11.83%	38.84%	0.74%	39.57%	2.96%
NEVP	98.93%	95.97%	98.21%	76.94%	88.16%	59.89%
NWMT	97.18%	79.84%	99.70%	73.36%	99.60%	96.64%
PACE	54.44%	3.76%	42.56%	8.19%	47.11%	6.73%
PACW	0.40%	5.38%		6.25%		3.50%
PGE	97.98%		98.96%		100.00%	0.14%
PNM	82.80%	20.83%	87.65%	34.23%	63.39%	28.00%
PSEI	0.13%					
SCL						
SRP	99.87%	99.19%	100.00%	98.96%	99.87%	98.92%
TIDC	99.87%	99.87%	100.00%	100.00%	100.00%	99.73%
TPWR					85.33%	96.77%

Table 1: Frequency of ABC Submitted to the WEIM

The table below shows the average ABC capacity, in MW, which each WEIM entity submitted to the WEIM for each month within the guarter. BCHA consistently

submitted the highest average ABC capacity to the WEIM in both the upward and downward directions, while IPCO and SCL did not submit any ABC capacity to the WEIM.

**Table 2: Average ABC Capacity Submitted to the WEIM** 

	Janua	ry 2022	Februa	ry 2022	March 2022	
BAA	Upward Capacity (MW)	Downward Capacity (MW)	Upward Capacity (MW)	Downward Capacity (MW)	Upward Capacity (MW)	Downward Capacity (MW)
AVA					20	20
AZPS	20.03	20	19.97	20	19.98	20.08
BANC	16.22	36.44	19.87	36.94	16.41	24.11
BCHA	638.71	300	590.68	300	642.48	300
IPCO						
LADWP	72.58	75.57	73.42	142	74.55	51.17
NEVP	23.36	33.46	18.11	34.85	18.13	27.4
NWMT	17.6	9.22	18.66	8.52	15.2	10.08
PACE	21.51	59.88	21.47	34.51	16.91	60.65
PACW	60	73.62		27.69		108.33
PGE	29		28.3		10.83	0.05
PNM	27.01	26.19	26.89	30.19	26.86	28.96
PSEI	30					
SCL						
SRP	29.95	23.8	28.28	24.08	29.09	25.66
TIDC	12.65	5	12.79	5	12.56	4.98
TPWR					3.29	3.82

The table below show the maximum ABC capacity, in MW, which each WEIM 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** 

	January 2022		February 2022		March 2022	
BAA	Upward Capacity (MW)	Downward Capacity (MW)	Upward Capacity (MW)	Downward Capacity (MW)	Upward Capacity (MW)	Downward Capacity (MW)
AVA					20	20
AZPS	54	20	20	20	20	89
BANC	79	100	95	85	100	92
ВСНА	1000	500	1000	500	1000	500
IPCO						
LADWP	238	200	200	250	233	75
NEVP	80	100	50	120	50	80

NWMT	25	15	25	20	25	25
PACE	125	100	40	100	50	130
PACW	60	150		50		125
PGE	30		125		25	0.05
PNM	30	85	40	65	50	70
PSEI	30					
SCL						
SRP	100	50	100	68	100	60
TIDC	15	5	15	5	15	5
TPWR					10	52

The table below shows the number of different resources supporting the ABC that the WEIM entities bid into the WEIM in both the upward and downward directions, for each month within the quarter. A maximum of 16 resources supported upward ABC capacity bids 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** 

	Janua	ry 2022	Februa	ry 2022	March 2022	
BAA	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity
AVA					8	8
AZPS	7	6	7	6	9	8
BANC	13	7	14	10	14	15
ВСНА	2	2	2	2	2	2
IPCO						
LADWP	6	9	2	2	5	4
NEVP	10	10	12	11	12	11
NWMT	3	3	2	3	2	2
PACE	6	2	3	3	6	6
PACW	2	2		2		3
PGE	6		6		7	1
PNM	2	2	5	6	2	9
PSEI	1					
SCL						
SRP	16	14	14	12	14	12
TIDC	3	3	2	2	1	1
TPWR					5	5

## B. ABC Awarded by the Market

The table below shows the frequency of each WEIM entities' dispatched ABC for the FMM market, when the WEIM 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 January 2022 on SRP'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

	Janu	ary 2022	Febru	ary 2022	Marc	ch 2022
BAA	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity
AVA						
AZPS	0.03%			0.11%	0.77%	0.14%
BANC				0.04%		0.03%
ВСНА		0.03%				0.07%
IPCO						
LADWP						
NEVP	0.03%	1.14%	1.30%	1.27%	0.20%	1.25%
NWMT					0.03%	
PACE						
PACW						
PGE	0.03%		0.04%		0.03%	
PNM		0.17%	0.15%	0.89%	0.03%	0.14%
PSEI						
SCL						
SRP	5.44%	8.13%	2.53%	3.72%	3.13%	0.81%
TIDC		0.13%				0.07%
TPWR					0.03%	0.03%

The table below shows the frequency of each WEIM entities' dispatched ABC for the RTD market, when the WEIM 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 January 2022 on SRP'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

	January 2022		February 2022		March 2022	
BAA	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity	Upward Capacity	Downward Capacity
AVA						
AZPS	0.08%	0.36%	0.11%	0.15%	0.07%	0.09%
BANC				0.01%	0.19%	0.07%
BCHA		0.01%				0.12%
IPCO						
LADWP		0.16%				

NEVP		0.58%	0.22%	0.99%	0.31%	0.35%
NWMT	0.31%		0.20%			
PACE	0.03%					
PACW						0.01%
PGE	0.13%		0.06%		0.09%	
PNM	0.10%	0.12%	0.29%	0.56%	0.11%	0.42%
PSEI						
SCL						
SRP	2.35%	4.21%	1.56%	2.49%	1.69%	0.73%
TIDC	0.01%	0.03%			0.03%	0.07%
TPWR					0.02%	0.11%

#### 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 WEIM 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 WEIM entity did not submit any ABC to the WEIM. These instances occurred relatively infrequently throughout the quarter, indicating that the WEIM 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	January 2022		February 2022		March 2022	
	Over- supply	Under- supply	Over- supply	Under- supply	Over- supply	Under- supply
AVA						

AZPS	91.67%	0.00%	0.00%		60.00%	
BANC						
ВСНА		100.00%				
IPCO				100.00%		
LADWP		100.00%				100.00%
NEVP	50.00%		67.57%	12.50%	82.35%	0.00%
NWMT						0.00%
PACE						
PACW		100.00%				100.00%
PGE				0.00%		0.00%
PNM	100.00%			0.00%	100.00%	
PSEI				100.00%		100.00%
SCL					100.00%	100.00%
SRP	0.00%		0.00%		0.00%	0.00%
TIDC	0.00%					
TPWR						0.00%

The table below shows the frequency of intervals in which the WEIM 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

	Janua	January 2022		ary 2022	Marc	h 2022
BAA	Over- supply	Under- supply	Over- supply	Under- supply	Over- supply	Under- supply
AVA						
AZPS	70.97%	0.00%	14.29%	40.00%	85.19%	100.00%
BANC						
ВСНА		100.00%				
IPCO		100.00%		100.00%		
LADWP	100.00%			100.00%		70.00%
NEVP	36.36%		53.15%	15.38%	73.33%	0.00%
NWMT		11.11%		0.00%		
PACE		0.00%				
PACW		100.00%		100.00%		100.00%
PGE		0.00%		0.00%		0.00%
PNM	100.00%	0.00%	0.00%	0.00%	29.41%	
PSEI						100.00%
SCL	100.00%				100.00%	100.00%
SRP	0.00%	13.33%	0.00%	0.00%	0.00%	0.00%
TIDC	0.00%				0.00%	
TPWR					0.00%	33.33%

#### **III.** WEIM Performance

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

#### A. ELAP Prices

The figures in this section show the WEIM load aggregation point (ELAP) prices<sup>5</sup> 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.<sup>6</sup>

The CAISO may correct prices posted on its Open Access Same-time Information System (OASIS) pursuant to the CAISO's price correction authority in 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 WEIM entities for each month within the quarter. Prices were relatively consistent across all months in the quarter.

ВАА	January 2022		February 2022		March 2022	
	FMM (\$/MWh)	RTD (\$/MWh)	FMM (\$/MWh)	RTD (\$/MWh)	FMM (\$/MWh)	RTD (\$/MWh)
AVA					34.54	28.74
AZPS	39.2	33.24	33.96	29.39	31.23	31.25
BANC	53	45.13	47.72	41.87	47.54	49.32
BCHA	36.37	34.34	33.73	32.08	32.03	31.13

Table 9: Average FMM and RTD ELAP Prices

<sup>&</sup>lt;sup>5</sup> The ELAP provides aggregate prices that are representative of pricing in the overall BAA.

<sup>&</sup>lt;sup>6</sup> 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.

IPCO	42.98	38.22	40.63	35.79	35.18	29.6
LADWP	50.08	41.59	41.92	35.34	40.82	38.83
NEVP	40.47	34.64	38.43	31.21	34.76	33.09
NWMT	40.59	37.64	37.15	33.94	34.33	28.48
PACE	37.26	32.13	34.71	30.09	31.75	27.82
PACW	38.96	35.41	34.83	32.33	31.62	27.5
PGE	38.32	35.51	35.3	32.4	32.69	26.43
PNM	37.01	32.5	34.22	31.34	30.02	28.27
PSEI	36.57	33.52	34.41	32.01	30.75	27.97
SCL	37.23	34.06	34.28	32.29	30.92	28.2
SRP	39.34	34.9	33.61	29.36	33.48	33.06
TIDC	54.26	46.4	48.7	42.85	47.7	49.66
TPWR					30.23	27.43

## 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 WEIM entity passed the balancing test, as well as what percentage of balancing test failures were due to underscheduling and over-scheduling, for each month within the quarter. Overall, the entities passed the balancing test at high frequencies.

**Table 10: Frequency of Passing Balancing Test** 

BAA	January 2022	February 2022	March 2022
AVA			95.83%
AZPS	98.92%	97.92%	98.38%
BANC	99.73%	99.85%	99.19%
BCHA			
IPCO	99.73%	99.40%	99.87%
LADWP	99.60%	97.62%	99.06%
NEVP	98.92%	97.62%	96.50%
NWMT	99.60%	98.36%	98.52%
PACE	99.33%	98.81%	99.33%
PACW	99.60%	98.96%	98.92%
PGE	99.06%	98.81%	98.79%
PNM	99.06%	97.92%	97.44%
PSEI	99.06%	98.81%	99.33%
SCL	100.00%	99.70%	99.60%
SRP	98.39%	99.40%	98.25%
TIDC	99.73%	99.85%	99.46%
TPWR			96.23%

The table below shows the frequency of balancing test failures due to overscheduling and under-scheduling respectively, for each month of the quarter. 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

ВАА	January 2022		February 2022		March 2022	
	Over- scheduling	Under- Scheduling	Over- scheduling	Under- Scheduling	Over- scheduling	Under- Scheduling
AVA					33.33%	66.67%
AZPS	62.50%	37.50%	38.46%	61.54%	36.36%	63.64%
BANC		100.00%			20.00%	80.00%
BCHA						
IPCO		100.00%	33.33%	66.67%		
LADWP	66.67%	33.33%	20.00%	80.00%		100.00%
NEVP	25.00%	75.00%	66.67%	33.33%	64.00%	36.00%
NWMT	33.33%	66.67%	20.00%	80.00%	50.00%	50.00%
PACE	80.00%	20.00%	85.71%	14.29%	100.00%	
PACW	66.67%	33.33%	33.33%	66.67%	14.29%	85.71%
PGE	42.86%	57.14%	28.57%	71.43%	62.50%	37.50%
PNM	28.57%	71.43%	46.15%	53.85%	61.11%	38.89%
PSEI	28.57%	71.43%	42.86%	57.14%	25.00%	75.00%
SCL				100.00%	100.00%	
SRP	8.33%	91.67%		100.00%	41.67%	58.33%
TIDC		100.00%			33.33%	66.67%
TPWR					100.00%	

## C. Flexible Ramp Sufficiency Test Failures

The table below shows the frequency that each WEIM 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** 

ВАА	Janua	January 2022		February 2022		March 2022	
	Upward Direction	Downward Direction	Upward Direction	Downward Direction	Upward Direction	Downward Direction	
AVA					96.64%	96.64%	
AZPS	99.97%	98.56%	99.67%	99.44%	99.80%	99.02%	
BANC	100.00%	100.00%	99.85%	99.85%	99.87%	99.76%	
ВСНА	99.76%	100.00%	99.81%	99.81%	99.87%	99.63%	

IPCO	100.00%	100.00%	99.63%	99.81%	99.87%	99.87%
LADWP	100.00%	99.87%	99.85%	99.85%	99.76%	99.87%
NEVP	99.97%	99.43%	99.11%	95.72%	99.50%	98.18%
NWMT	100.00%	100.00%	99.70%	99.85%	99.73%	99.87%
PACE	99.97%	100.00%	99.81%	99.85%	99.87%	99.87%
PACW	99.97%	100.00%	99.81%	99.85%	99.80%	99.83%
PGE	99.66%	100.00%	99.81%	99.85%	99.87%	99.87%
PNM	100.00%	99.70%	99.85%	99.81%	99.80%	98.65%
PSEI	100.00%	100.00%	99.85%	99.85%	99.83%	99.87%
SCL	100.00%	100.00%	99.85%	99.85%	99.80%	99.80%
SRP	99.83%	99.93%	99.85%	98.81%	99.23%	98.32%
TIDC	100.00%	99.80%	99.85%	99.85%	99.87%	99.39%
TPWR					96.64%	96.64%

## **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 2<sup>nd</sup> day of May 2022.

<u>Isl Anna Pascuzzo</u> Anna Pascuzzo