WESTERN ENERGY IMBALANCE MARKET BENEFITS REPORT

First Quarter 2025

Prepared by: Market Performance and Advanced Analytics

April 30, 2025

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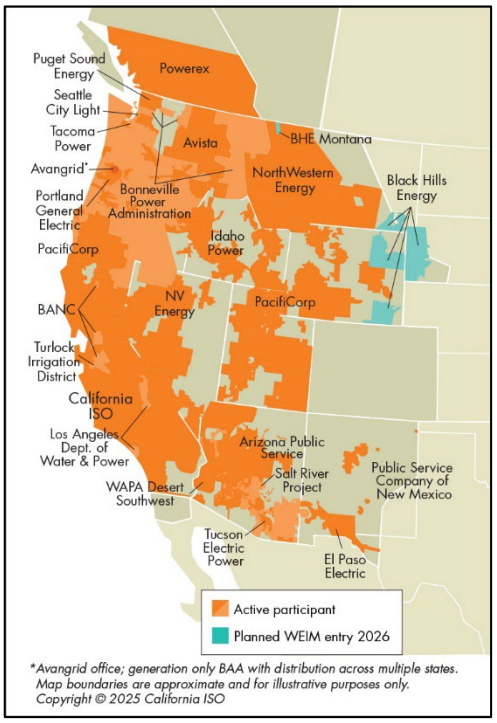
EXECUTIVE SUMMARY

Gross benefits from WEIM since November 2014

$6.99 billion

This report presents the benefits associated with participation in the Western Energy Imbalance Market (WEIM).

The measured benefits of participation in the WEIM include cost savings, increased integration of renewable energy, and improved operational efficiencies including the reduction of the need for real-time flexible reserves. The WEIM also provides significant reliability benefits by enhancing situational awareness and supporting access to surplus renewable energy across a broader western footprint.



Q1 2025 Gross Benefits by Participant (entry year)

	($ millions)
Arizona Public Service (2016)	$4.10
AVANGRID (2023)	$11.22
Avista (2022)	$2.50
Balancing Authority of Northern California (2019)	$28.76
Bonneville Power Administration (2022)	$8.06
California ISO (2014)	$21.96
El Paso Electric (2023)	$3.22
Idaho Power Company (2018)	$10.31
Los Angeles Dept. of Water & Power (2021)	$17.46
NV Energy (2015)	$81.71
NorthWestern Energy (2021)	$13.69
PacifiCorp (2014)	$50.15
Portland General Electric (2017)	$11.29
Public Service Company New Mexico (2021)	$22.53
Puget Sound Energy (2016)	$11.26
Powerex (2018)	$7.90
Seattle City Light (2020)	$23.22
Salt River Project (2020)	$11.19
Tacoma Power (2022)	$3.17
Tucson Electric Power (2022)	$3.96
Turlock Irrigation District (2021)	$1.10
WAPA Desert Southwest Region (2023)	$20.60
Total	$369.36

2025 Q1 BENEFITS

ECONOMICAL

$369.36 M

Gross benefits realized due to more efficient inter- and intra-regional dispatch in the Fifteen-Minute Market (FMM) and Real-Time Dispatch (RTD)*

ENVIRONMENTAL

32,534

Metric tons of CO_2** avoided curtailments

OPERATIONAL

58%

Average reduction in flexibility reserves across the footprint

This analysis demonstrates the benefit of economic dispatch in the real time market across a larger WEIM footprint with diverse resources and geography.

*WEIM Quarterly Benefit Report Methodology: https://www.westerneim.com/Documents/EIM-BenefitMethodology.pdf.

**The GHG emission reduction reported is associated with the avoided curtailment only. The current market process and counterfactual methodology cannot differentiate the GHG emissions resulting from serving ISO load via the WEIM versus dispatch that would have occurred external to the ISO without the WEIM. For more details, see http://www.caiso.com/Documents/GreenhouseGasEmissionsTrackingReport-FrequentlyAskedQuestions.pdf

*** In this report, California ISO is the balancing area and not a market participant. The benefits estimated for the California ISO balancing area in this report are realized to its market participants instead of the California ISO Corporation.

BACKGROUND

The WEIM began financially binding operation on November 1, 2014, by optimizing resources across the ISO and PacifiCorp Balancing Authority Areas (BAAs). Since then, the WEIM has continued to grow and now includes 22 market participants and represents nearly 80% of the demand for electricity in the Western interconnection. Today, the WEIM footprint includes portions of Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, Texas and extends to the border with Canada.

WEIM ECONOMIC BENEFITS IN Q1 2025

Table 2 shows the estimated WEIM gross benefits by each region per month[1]. The monthly savings presented show $113.55 million for January, $105.63 million for February and $150.18 million for March with a total estimated benefit of $369.36 million for this quarter[2]. This level of WEIM benefits accrued from having additional WEIM areas participating in the market and economical transfers displacing more expensive generation.

[1] The WEIM benefits reported here are calculated based on available data. Intervals without complete data are excluded in the calculation. The intervals excluded due to unavailable data are normally within a few percent points of the total intervals.
[2] For several quarterly estimates, CAISO benefits were calculated on a variation of the counterfactual methodology. For CAISO only the logic had considered offline resources as part of the bid stack in the counterfactual. In Q4 2021, CAISO identified some questionable results that drove persistent negative benefits for CAISO when considering offline resources. Since Q4 2021, the benefit calculation for CAISO area follows the same methodology applicable to all WEIM entities in which only online resources are used.

Region	January	February	March	Total
APS	$2.25	$1.06	$0.79	$4.10
AVRN	$2.91	$4.01	$4.30	$11.22
AVA	$0.73	$0.98	$0.79	$2.50
BANC	$9.73	$5.92	$13.11	$28.76
BPA	$1.65	$2.99	$3.42	$8.06
CISO	$7.54	$8.99	$5.43	$21.96
EPE	$1.04	$0.99	$1.19	$3.22
IPCO	$2.26	$2.18	$5.87	$10.31
LADWP	$8.70	$4.23	$4.53	$17.46
NVE	$20.04	$22.18	$39.49	$81.71
NWMT	$4.64	$3.50	$5.55	$13.69
PAC	$17.96	$16.00	$16.19	$50.15
PGE	$3.29	$3.05	$4.95	$11.29
PNM	$7.49	$7.70	$7.34	$22.53
PSE	$4.43	$3.47	$3.36	$11.26
PWRX	$2.18	$1.19	$4.53	$7.90
SCL	$7.08	$7.78	$8.36	$23.22
SRP	$3.37	$3.97	$3.85	$11.19
TPWR	$0.79	$1.22	$1.16	$3.17
TEP	$1.38	$1.00	$1.58	$3.96
TID	$0.26	$0.40	$0.44	$1.10
WALC	$3.83	$2.82	$13.95	$20.60
Total	$113.55	$105.63	$150.18	$369.36

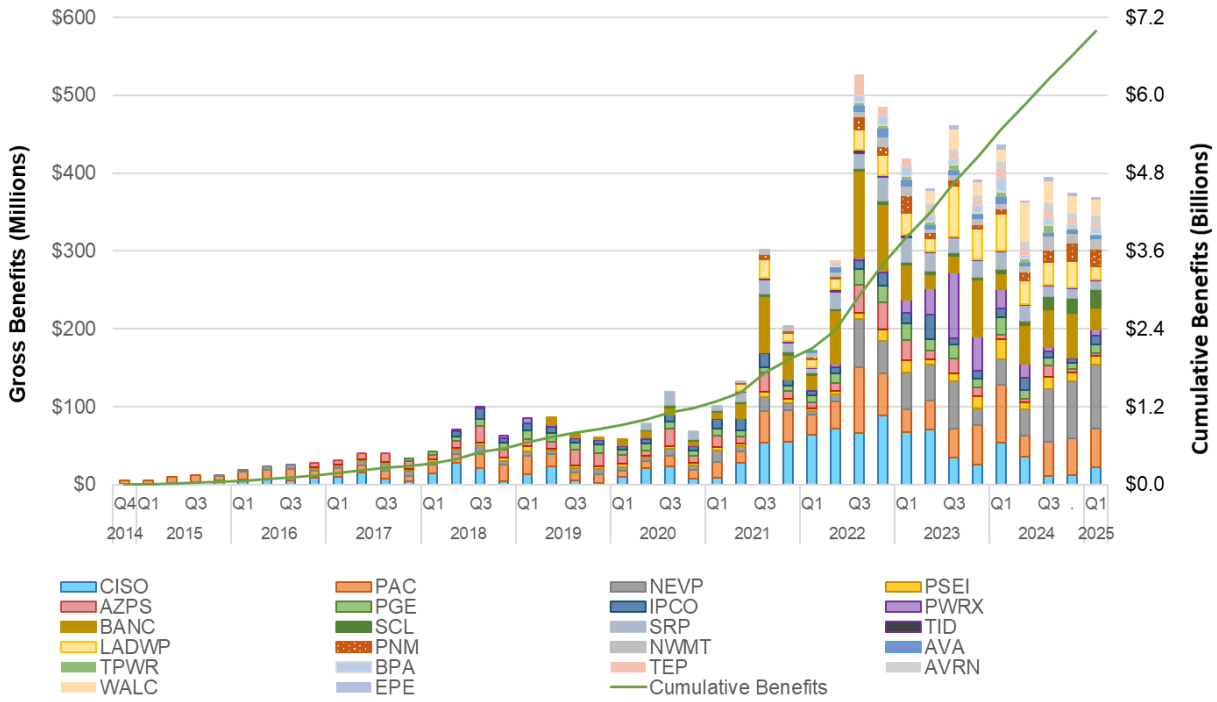
TABLE 1: Q1 2025 benefits in millions USD

CUMULATIVE ECONOMIC BENEFITS SINCE INCEPTION

Since the start of the WEIM in November 2014, the cumulative economic benefits of the market have totaled $6.99 billion. The quarterly benefits have grown over time as a result of the participation of new BAAs, which results in benefits for both the individual BAA but also compounds the benefits to adjacent BAAs through additional transfers. The ISO began publishing quarterly WEIM benefit reports in April 2015.[3]

Graph 1 illustrates the gross economic benefits of the WEIM by quarter for each participating BAA.

[3] Prior reports are available at https://www.westerneim.com/Pages/About/QuarterlyBenefits.aspx



GRAPH 1: Cumulative economic benefits for each quarter by BAA

INTER-REGIONAL TRANSFERS

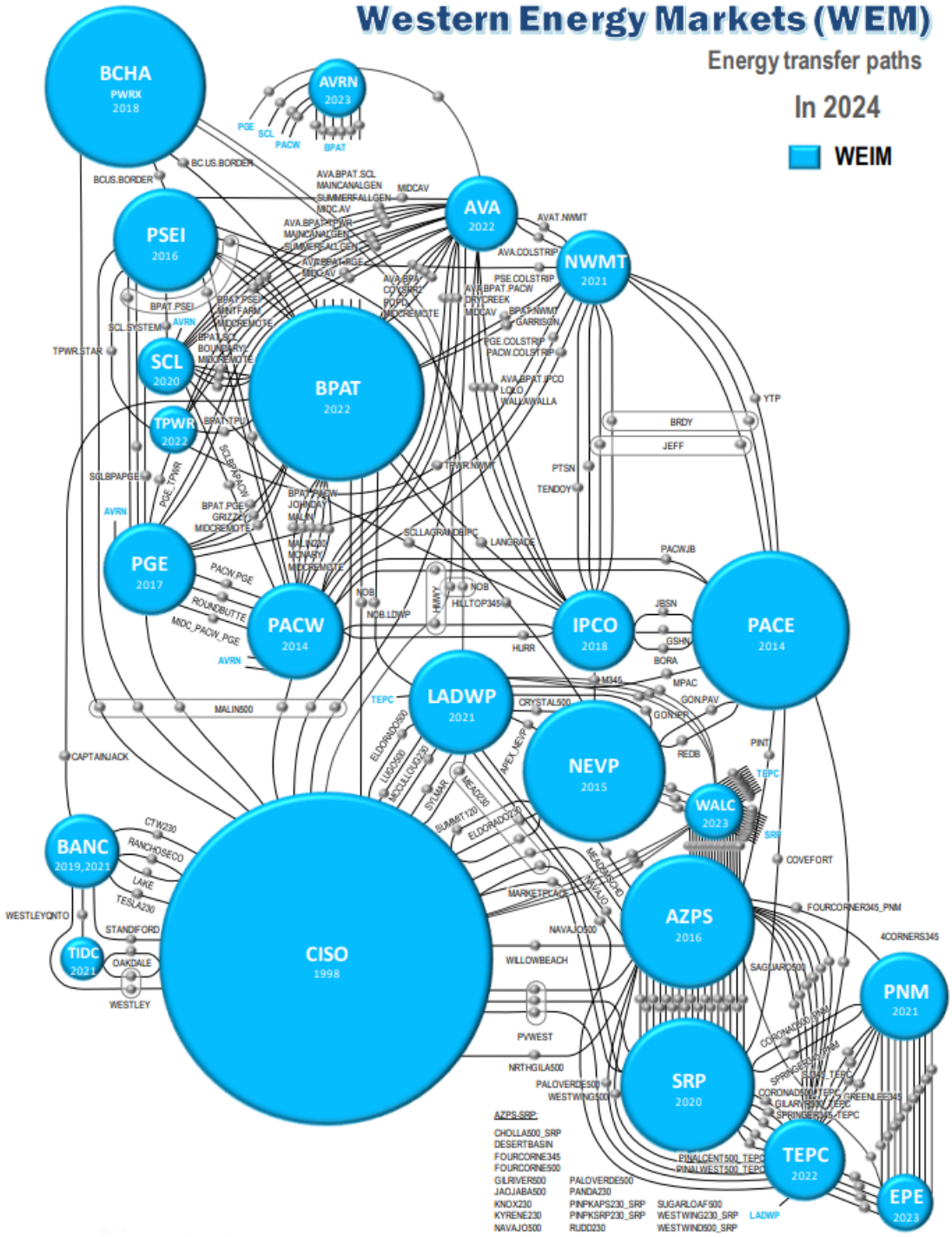
A significant contributor to WEIM benefits is transfers across balancing areas, providing access to lower cost supply, while factoring in the cost of compliance with greenhouse gas (GHG) emissions regulations when energy is transferred into the ISO. As such, the transfer volumes are a good indicator of a portion of the benefits attributed to the WEIM. Transfers can take place in both the 15-Minute Market and Real-Time Dispatch (RTD).

Generally, transfer limits are based on transmission and interchange rights that participating balancing authority areas make available to the WEIM, with the exception of the PacifiCorp West (PACW) -ISO transfer limit and the Portland General Electric (PGE) -ISO transfer limit in RTD. These RTD transfer capacities between PACW/PGE and the ISO are determined based on the allocated dynamic transfer capability driven by system operating conditions. This report does not quantify a BAA's opportunity cost that the utility considered when using its transfer rights for the WEIM. Graph 2 illustrates the WEIM ETSR (Energy Transfer System Resource).

Appendix 2 provides the 15-minute and 5-minute WEIM transfer volumes with base schedule transfers excluded. The WEIM entities submit inter-BAA transfers in their base schedules. The benefits quantified in this report are only attributable to the transfers that occurred through the WEIM. The benefits do not include any transfers attributed to transfers submitted in the base schedules that are scheduled prior to the start of the WEIM.

The transfer from BAA_x to BAA_y and the transfer from BAA_y to BAA_x are separately reported. For example, if there is a 100 Megawatt-Hour (MWh) transfer during a 5-minute interval, in addition to a base transfer from ISO to NVE, it will be reported as 100 MWh from_BAA ISO to_BAA NEVP, and 0 MWh from_BAA NEVP to_BAA ISO in the opposite

direction. The 15-minute transfer volume is the result of optimization in the 15-minute market using all bids and base schedules submitted into the WEIM. The 5-minute transfer volume is the result of optimization using all bids and base schedules submitted into WEIM, based on unit commitments determined in the 15-minute market optimization.



GRAPH 2: WEIM transfer

WHEEL-THROUGH TRANSFERS

As the footprint of the WEIM grows, wheel-through transfers may become more common. In order to derive the wheel-through transfers for each WEIM BAA, the ISO uses the following calculation for every real-time interval dispatch:

- *Total import*: summation of transfers above base transfers coming into the WEIM BAA under analysis
- *Total export*: summation of all transfers above base transfers going out of the WEIM BAA under analysis
- *Net import*: the maximum of zero or the difference between total imports and total exports
- *Net export*: the maximum of zero or the difference between total exports and total imports
- *Wheel-through*: the minimum of the WEIM transfers into (total import) or WEIM transfer out (total export) of a BAA for a given interval

All wheel-through transfers are summed over both the month and the quarter.

Currently, a WEIM entity facilitating a wheel through receives no direct financial benefit for facilitating the wheel; only the sink and source directly benefit. As part of the WEIM Consolidated Initiatives stakeholder process, the ISO committed to monitoring the wheel through volumes to assess whether, after the addition of new WEIM entities, there is a potential future need to pursue a market solution to address the equitable sharing of wheeling benefits.

The ISO will continue to track the volume of wheel-through transfers in the WEIM market in the quarterly reports.

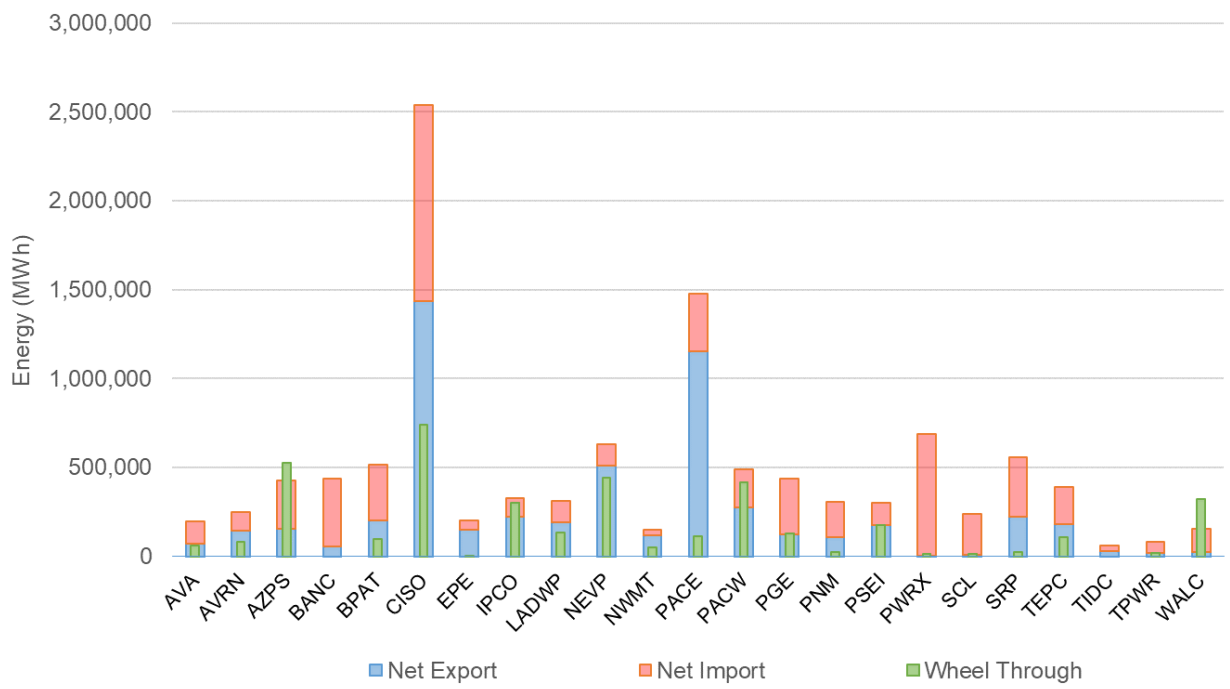
This volume reflects the total wheel-through transfers for each WEIM BAA, regardless of the potential paths used to wheel through. The net imports and exports estimated in this section reflect the overall volume of net imports and exports; in contrast, the imports and exports provided in Table 2 reflect the gross transfers between two WEIM BAAs.

The metric is measured as energy in MWh for each month and the corresponding calendar quarter, as shown in Tables 3 through 6 and Graphs 3 through 6.

BAA	Net Export	Net Import	Wheel Through
AVA	72,838	124,275	59,241
AVRN	145,841	100,788	79,884
AZPS	156,433	271,967	526,179
BANC	57,027	379,214	-
BPAT	200,013	313,283	98,322
CISO	1,433,685	1,104,747	737,758
EPE	149,381	51,523	968
IPCO	220,783	105,268	301,349
LADWP	193,139	119,486	135,723

NEVP	508,048	122,399	441,646
NWMT	116,418	34,270	50,484
PACE	1,152,708	324,781	112,493
PACW	275,149	213,462	416,464
PGE	121,838	314,890	126,830
PNM	108,413	195,588	26,133
PSEI	174,146	129,191	176,001
PWRX	5,860	683,151	11,248
SCL	9,436	227,681	13,741
SRP	223,744	333,355	26,246
TEPC	181,783	208,410	109,031
TIDC	30,902	31,618	-
TPWR	16,407	63,265	17,942
WALC	25,961	127,343	321,853

TABLE 2: Estimated wheel-through transfers in Q1 2025

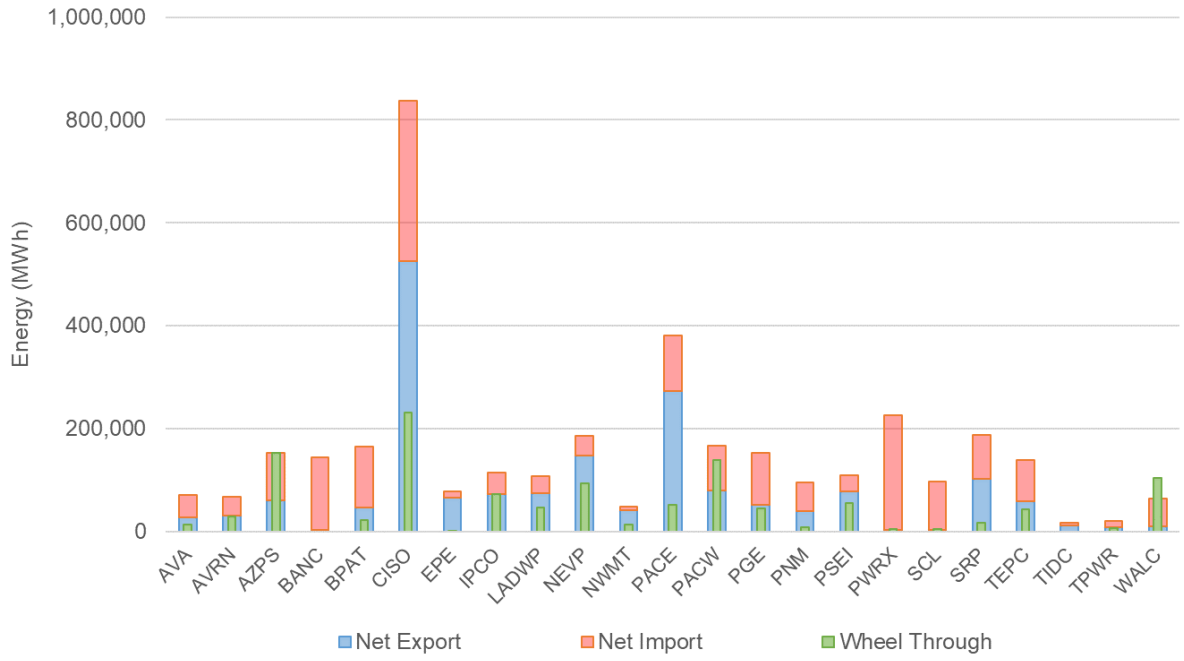


GRAPH 3: Estimated wheel-through transfers in Q1 2025

BAA	Net Export	Net Import	Wheel Through
AVA	27,224	43,576	12,853
AVRN	30,367	36,670	28,684
AZPS	59,525	92,327	152,029
BANC	3,338	139,789	-
BPAT	45,512	119,713	21,259

CISO	525,694	311,713	230,226
EPE	65,738	11,024	415
IPCO	72,946	41,565	72,982
LADWP	73,458	33,142	46,498
NEVP	147,333	38,060	92,764
NWMT	40,519	7,406	13,366
PACE	273,392	107,890	51,310
PACW	79,952	85,725	138,785
PGE	51,169	100,817	43,799
PNM	39,766	55,693	8,235
PSEI	77,553	31,348	55,316
PWRX	3,533	222,785	4,331
SCL	2,762	93,370	3,679
SRP	101,551	86,413	16,081
TEPC	59,266	79,141	42,112
TIDC	11,791	5,694	-
TPWR	7,165	12,165	6,919
WALC	10,119	53,646	103,358

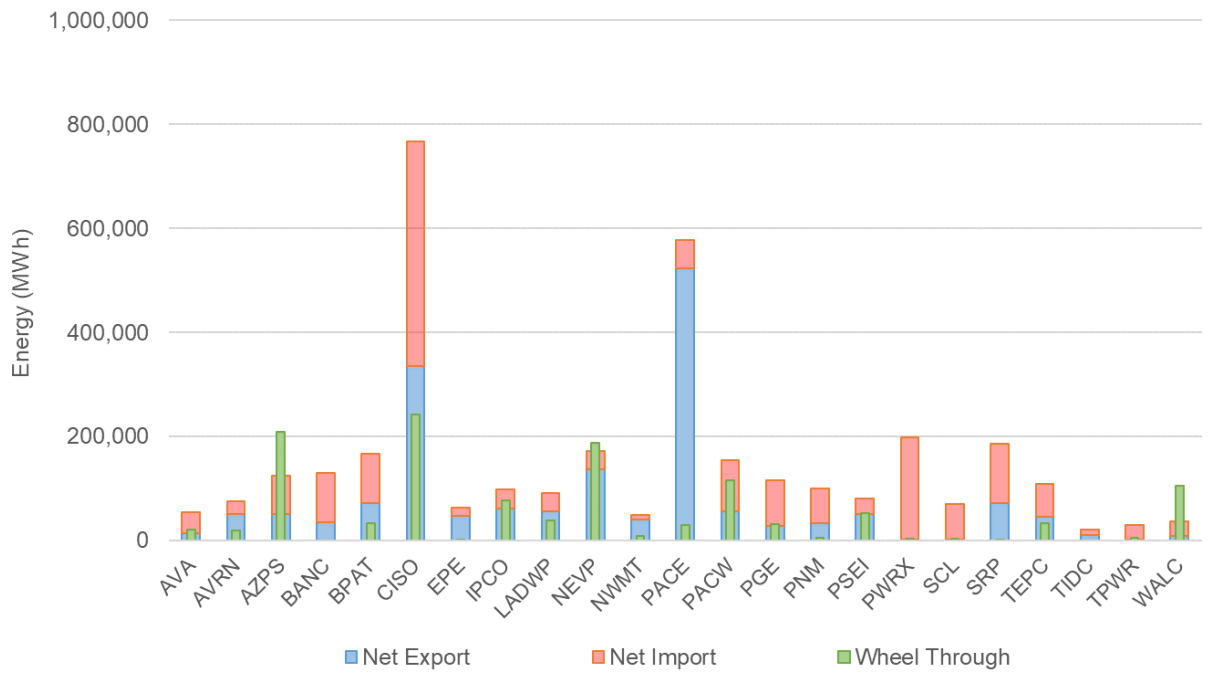
TABLE 3: Estimated wheel-through transfers in January 2025



GRAPH 4: Estimated wheel-through transfers in January 2025

BAA	Net Export	Net Import	Wheel Through
AVA	14,035	41,234	21,865
AVRN	50,991	24,263	20,052
AZPS	50,807	74,572	209,571
BANC	34,668	95,009	-
BPAT	71,464	95,150	32,688
CISO	335,810	431,796	241,901
EPE	47,650	15,215	318
IPCO	61,880	37,263	76,982
LADWP	57,082	33,789	38,624
NEVP	136,379	36,212	187,812
NWMT	39,913	10,211	9,602
PACE	523,243	53,515	29,719
PACW	56,470	97,613	116,591
PGE	27,638	87,991	32,410
PNM	34,284	66,542	6,112
PSEI	51,429	28,681	52,011
PWRX	1,327	196,461	3,059
SCL	2,237	68,142	3,484
SRP	71,379	115,168	1,084
TEPC	46,551	61,952	34,401
TIDC	9,882	11,459	-
TPWR	2,418	27,387	5,885
WALC	9,491	27,404	105,968

TABLE 4: Estimated wheel-through transfers in February 2025

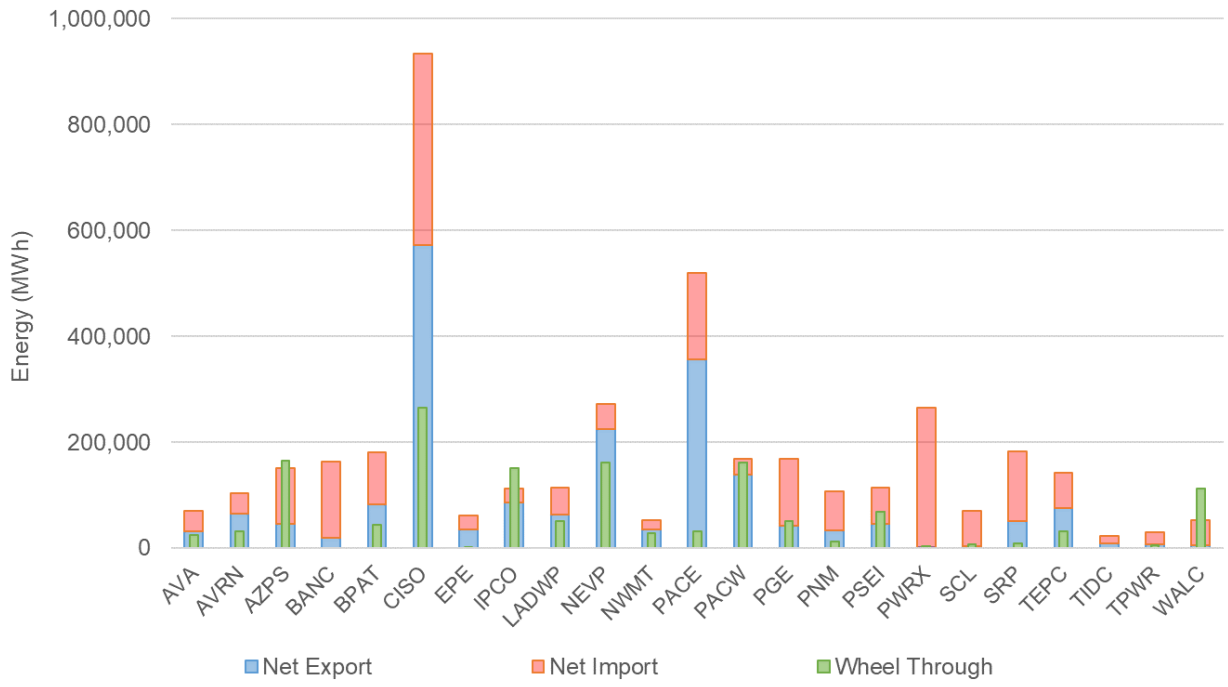


GRAPH 5: Estimated wheel-through transfers in February 2025

BAA	Net Export	Net Import	Wheel Through
AVA	31,579	39,465	24,523
AVRN	64,484	39,854	31,148
AZPS	46,100	105,068	164,579
BANC	19,020	144,415	-
BPAT	83,037	98,420	44,375
CISO	572,181	361,238	265,630
EPE	35,993	25,283	235
IPCO	85,958	26,440	151,384
LADWP	62,599	52,556	50,601
NEVP	224,337	48,127	161,070
NWMT	35,986	16,653	27,516
PACE	356,073	163,376	31,464
PACW	138,727	30,123	161,088
PGE	43,031	126,081	50,621
PNM	34,363	73,353	11,786
PSEI	45,164	69,163	68,674
PWRX	1,000	263,906	3,857
SCL	4,437	66,169	6,578
SRP	50,814	131,774	9,081
TEPC	75,966	67,317	32,517
TIDC	9,229	14,465	-
TPWR	6,825	23,713	5,138

WALC	6,351	46,293	112,527

TABLE 5: Estimated wheel-through transfers in March 2025



GRAPH 6: Estimated wheel-through transfers in March 2025

REDUCED RENEWABLE CURTAILMENT AND GHG REDUCTIONS

The WEIM benefit calculation includes the economic benefits that can be attributed to avoided renewable curtailment within the ISO footprint. If not for energy transfers facilitated by the WEIM, some renewable generation located within the ISO would have been curtailed via either economic or exceptional dispatch. The total avoided renewable curtailment volume in MWh for Q1 2025 was calculated to be 25,585 MWh (January) + 14,986 MWh (February) + 35,444 MWh (March) = 76,015 MWh total.

There are environmental benefits of avoided renewable curtailment as well. Under the assumption that avoided renewable curtailments displace production from other resources at a default emission rate of 0.428 metric tons CO_2/MWh, avoided curtailments displaced an estimated 32,534 metric tons of CO_2 for Q1 2025. Avoided renewable curtailments also may have contributed to an increased volume of renewable credits that would otherwise have been unavailable. This report does not quantify the additional value in dollars associated with this benefit. Total estimated reductions in the curtailment of renewable energy in the ISO footprint, along with the associated reductions in CO_2, are shown in Table 6.

Year	Quarter	MWh	Eq. Tons CO_2
2015	1	8,860	3,792
	2	3,629	1,553
	3	828	354
	4	17,765	7,521
2016	1	112,948	48,342
	2	158,806	67,969
	3	33,094	14,164
	4	23,390	10,011
2017	1	52,651	22,535
	2	67,055	28,700
	3	23,331	9,986
	4	18,060	7,730
2018	1	65,860	28,188
	2	129,128	55,267
	3	19,032	8,146
	4	23,425	10,026
2019	1	52,254	22,365
	2	132,937	56,897
	3	33,843	14,485
	4	35,254	15,089
2020	1	86,740	37,125
	2	147,514	63,136
	3	37,548	16,071
	4	39,956	17,101
2021	1	76,147	32,591
	2	109,059	46,677
	3	23,042	9,862
	4	38,044	16,283
2022	1	94,168	40,304
	2	118,352	50,655
	3	42,468	18,176
	4	25,609	10,960
2023	1	53,002	22,685
	2	148,938	63,745
	3	60,113	25,728

	4	49,880	21,349
2024	1	60,285	25,802
	2	130,656	55,921
	3	53,049	22,705
	4	30,462	13,038
2025	1	76,015	32,534
Total		2,513,197	1,075,568

TABLE 6: Total reduction in curtailment of renewable energy and associated reductions in CO_2

FLEXIBLE RAMPING PROCUREMENT DIVERSITY SAVINGS

The WEIM facilitates procurement of flexible ramping capacity in the FMM to address variability that may occur in the RTD. Because variability across different BAAs may happen in opposite directions, the flexible ramping requirement for the entire WEIM footprint can be less than the sum of individual BAA's requirements. This difference is known as flexible ramping procurement diversity savings.

Starting in 2016, the ISO replaced the flexible ramping constraint with flexible ramping products that provide both upward and downward ramping. The minimum and maximum flexible ramping requirements for each BAA and for each direction are listed in Appendix 3: Minimum & Maximum Ramping Requirements.

The flexible ramping procurement diversity savings for all the intervals averaged over the month are shown in Table 7. The percentage savings is the average MW savings divided by the sum of the individual BAA requirements.

	January		**February**		**March**	
Direction	Up	Down	Up	Down	Up	Down
Average MW saving	1,781	1,868	1,926	1,805	2,259	2,207
Sum of BAA requirements	3,295	3,008	3,413	3,062	3,935	3,645
Percentage savings	54%	62%	56%	59%	57%	61%

Table 7: Flexible ramping procurement diversity savings in Q1 2025

Flexible ramping capacity may be used in RTD to handle uncertainties in the future interval. The RTD flexible ramping capacity is prorated to each BAA. Flexible ramping surplus MW is defined as the awarded flexible ramping capacity in RTD minus its share, and the flexible ramping surplus cost is defined as the flexible ramping surplus MW multiplied by the flexible ramping WEIM-wide marginal price. A positive flexible ramping surplus MW is the capacity that a BAA provided to help other BAAs, and a negative flexible ramping surplus MW is the capacity that a BAA received from other BAAs.

The WEIM dispatch cost for a BAA with positive flexible ramping surplus MW is increased because some capacities are used to help other BAAs. The flexible ramping surplus cost is subtracted from the BAA's WEIM dispatch cost to reflect the true dispatch cost of a BAA. Please see the Benefit Report Methodology for more details.

CONCLUSION

Using state-of-the-art technology to find and deliver low-cost energy to meet real-time demand, the WEIM demonstrates that utilities can realize financial and operational benefits through increased coordination and optimization. The WEIM provides significant reliability benefits by enhancing situational awareness and supporting access to surplus energy across a broader western footprint. In addition to these benefits, the WEIM provides significant environmental benefits through the reduction of renewable curtailments during periods of oversupply.

Sharing resources across a larger geographic area reduces greenhouse gas emissions by using renewable generation that otherwise would have been turned off. The quantified environmental benefits from avoided curtailments of renewable generation from 2015 to-date reached 1,075,568 metric tons of CO_2, roughly the equivalent of avoiding the emissions from 226,133 passenger cars driven for one year.

APPENDIX 1: GLOSSARY OF ABBREVIATIONS

Abbreviation	Description
APS	Arizona Public Service
AVA	Avista Utilities
AVRN	Avangrid
BAA	Balancing Authority Area
BANC	Balancing Authority of Northern California
BPA	Bonneville Power Administration
CISO, ISO	California ISO
EIM	Energy Imbalance Market
EPE	El Paso Electric
FMM	Fifteen Minute Market
GHG	Greenhouse Gas
IPCO	Idaho Power
LADWP	Los Angeles Department of Water and Power
MW	Megawatt
MWh	Megawatt-Hour
NVE	NV Energy
NWMT	NorthWestern Energy
PAC	PacifiCorp
PACE	PacifiCorp East
PACW	PacifiCorp West
PGE	Portland General Electric
PNM	Public Service Company of New Mexico
PSE	Puget Sound Energy
PWRX	Powerex
RTD	Real Time Dispatch
SCL	Seattle City Light
SRP	Salt River Project
TEP	Tucson Electric Power
TID	Turlock Irrigation District
TPWR	Tacoma Power
WALC	Western Area Power Administration Desert Southwest
WEIM	Western Energy Imbalance Market

APPENDIX 2: WEIM Transfer Volume (MWh)

Month	From BAA	To BAA	15min WEIM transfer (15m – base)	5min WEIM transfer (5m – base)
January	AVA	AVRN	6,001	6,428
	AVA	BPAT	8,426	8,285
	AVA	CISO	0	0
	AVA	IPCO	8,082	10,044
	AVA	NWMT	3,868	5,896
	AVA	PACW	7,320	9,425
	AVA	PGE	0	0
	AVA	PSEI	0	0
	AVA	SCL	0	0
	AVA	TPWR	0	0
	AVRN	AVA	2,752	3,017
	AVRN	BPAT	28,793	28,681
	AVRN	PACW	13,947	14,510
	AVRN	PGE	5,185	4,567
	AVRN	SCL	9,396	8,275
	AZPS	CISO	111,495	91,433
	AZPS	EPE	2,440	0
	AZPS	LADWP	5,526	6,569
	AZPS	NEVP	0	0
	AZPS	PACE	65,995	55,684
	AZPS	PNM	31,187	31,576
	AZPS	SRP	15,660	19,673
	AZPS	TEPC	1,127	564
	AZPS	WALC	7,966	6,055
	BANC	BPAT	0	0
	BANC	CISO	3,387	3,338
	BANC	TIDC	26	0
	BPAT	AVA	2,930	2,099

	BPAT	AVRN	9,873	9,371
January	BPAT	BANC	0	0
	BPAT	CISO	10,191	24,590
	BPAT	IPCO	3,267	160
	BPAT	LADWP	0	0
	BPAT	NEVP	0	0
	BPAT	NWMT	4,779	241
	BPAT	PACW	2,573	820
	BPAT	PGE	11,116	9,879
	BPAT	PSEI	7,637	7,774
	BPAT	PWRX	4,177	0
	BPAT	SCL	5,367	4,291
	BPAT	TPWR	8,887	7,545
	CISO	AVA	0	0
	CISO	AZPS	61,995	56,294
	CISO	BANC	139,150	139,788
	CISO	BPAT	28,305	40,094
	CISO	LADWP	36,195	29,854
	CISO	NEVP	41,743	28,447
	CISO	PACW	30,475	64,695
	CISO	PGE	68,502	92,400
	CISO	PSEI	59,414	1,478
	CISO	PWRX	181,805	204,460
January	CISO	SRP	76,106	69,123
	CISO	TEPC	0	0
	CISO	TIDC	5,262	5,694
	CISO	WALC	26,578	23,490
	EPE	AZPS	286	0
	EPE	PNM	20,689	21,871
	EPE	TEPC	45,171	44,283
	IPCO	AVA	22,864	20,300
	IPCO	BPAT	3,495	2,478

	IPCO	NEVP	49,545	49,429
	IPCO	NWMT	1,097	1,934
January	IPCO	PACE	16,038	13,195
	IPCO	PACW	33,925	29,178
	IPCO	PSEI	17,362	16,548
	IPCO	SCL	14,522	12,866
	LADWP	AZPS	7,419	8,617
	LADWP	BPAT	0	0
	LADWP	CISO	58,625	55,481
	LADWP	NEVP	21,875	20,385
	LADWP	PACE	29,307	27,271
	LADWP	TEPC	0	0
	LADWP	WALC	9,074	8,202
	NEVP	AZPS	0	0
	NEVP	BPAT	0	0
	NEVP	CISO	105,083	100,012
	NEVP	IPCO	34,193	30,434
	NEVP	LADWP	23,300	23,351
	NEVP	PACE	55,731	45,905
January	NEVP	WALC	35,454	40,394
	NWMT	AVA	28,489	24,122
	NWMT	BPAT	4,448	3,080
	NWMT	IPCO	10,443	9,540
	NWMT	PACE	14,839	17,142
	NWMT	PACW	26	0
	NWMT	PGE	115	0
	NWMT	PSEI	73	0
	NWMT	TPWR	0	0
	PACE	AZPS	127,138	138,196
	PACE	IPCO	59,419	51,571
	PACE	LADWP	14,300	16,018
	PACE	NEVP	24,327	24,876

	PACE	NWMT	11,302	12,701
	PACE	PACW	83,886	73,179
January	PACE	SRP	0	0
	PACE	TEPC	8,017	8,161
	PACW	AVA	5,278	6,891
	PACW	AVRN	30,492	38,608
	PACW	BPAT	5,939	3,628
	PACW	CISO	50,704	80,370
	PACW	IPCO	11,321	9,446
	PACW	NWMT	2	0
	PACW	PGE	44,759	37,156
	PACW	PSEI	40,510	40,857
	PACW	SCL	2,019	1,780
	PGE	AVA	0	0
	PGE	AVRN	6,955	9,578
	PGE	BPAT	31,109	29,930
	PGE	CISO	28,174	28,721
	PGE	NWMT	149	0
	PGE	PACW	22,236	24,997
January	PGE	PSEI	213	202
	PGE	SCL	1,602	1,540
	PGE	TPWR	0	0
	PNM	AZPS	26,357	28,709
	PNM	EPE	7,140	5,948
	PNM	SRP	1,357	2,104
	PNM	TEPC	10,517	11,241
	PSEI	AVA	0	0
	PSEI	BPAT	23,969	19,765
	PSEI	CISO	35,217	1,219
	PSEI	IPCO	660	1,623
	PSEI	NWMT	452	0
	PSEI	PACW	4,163	7,588

	PSEI	PGE	145	286
January	PSEI	PWRX	24,398	22,656
	PSEI	SCL	74,578	68,193
	PSEI	TPWR	9,787	11,540
	PWRX	BPAT	2,865	0
	PWRX	CISO	0	0
	PWRX	PSEI	5,061	7,865
	SCL	AVA	0	0
	SCL	AVRN	646	1,370
	SCL	BPAT	1,143	969
	SCL	IPCO	992	1,730
	SCL	PACW	71	117
	SCL	PGE	191	328
	SCL	PSEI	1,072	1,918
	SRP	AZPS	13,038	7,754
	SRP	CISO	95,403	85,063
	SRP	PACE	0	0
	SRP	PNM	532	622
	SRP	TEPC	25,796	20,300
	SRP	WALC	5,455	3,894
	TEPC	AZPS	256	0
	TEPC	CISO	3,066	3,675
	TEPC	EPE	6,535	5,491
January	TEPC	LADWP	0	0
	TEPC	PACE	39	3
	TEPC	PNM	9,810	9,860
	TEPC	SRP	8,120	7,380
	TEPC	WALC	81,353	74,969
	TIDC	BANC	19	1
	TIDC	CISO	12,247	11,790
	TPWR	AVA	0	0
	TPWR	BPAT	4,034	4,061

January	TPWR	NWMT	0	0
	TPWR	PGE	0	0
	TPWR	PSEI	11,964	10,023
	WALC	AZPS	3,055	4,787
	WALC	CISO	53,891	56,238
	WALC	LADWP	4,907	3,847
	WALC	NEVP	7,462	7,687
	WALC	SRP	2,874	4,215
	WALC	TEPC	33,964	36,704
February	AVA	AVRN	6,100	7,229
	AVA	BPAT	13,107	13,155
	AVA	CISO	0	0
	AVA	IPCO	6,225	5,126
	AVA	NWMT	4,519	5,328
	AVA	PACW	4,258	5,062
	AVA	PGE	0	0
	AVA	PSEI	0	0
	AVA	SCL	0	0
	AVA	TPWR	0	0
	AVRN	AVA	3,570	3,621
	AVRN	BPAT	29,731	28,426
	AVRN	PACW	26,108	21,765
	AVRN	PGE	9,434	8,319
	AVRN	SCL	9,799	8,912
	AZPS	CISO	156,811	157,749
	AZPS	EPE	2,944	0
	AZPS	LADWP	5,602	7,138
	AZPS	NEVP	0	0
	AZPS	PACE	9,118	7,868
	AZPS	PNM	57,247	47,071
	AZPS	SRP	31,305	35,615
	AZPS	TEPC	832	167

	AZPS	WALC	6,200	4,770
February	BANC	BPAT	0	0
	BANC	CISO	35,592	34,668
	BANC	TIDC	26	0
	BPAT	AVA	5,114	3,615
	BPAT	AVRN	10,672	7,689
	BPAT	BANC	0	0
	BPAT	CISO	29,890	41,588
	BPAT	IPCO	6,301	280
	BPAT	LADWP	0	0
	BPAT	NEVP	0	0
	BPAT	NWMT	4,788	692
	BPAT	PACW	5,070	1,184
	BPAT	PGE	16,116	13,949
	BPAT	PSEI	16,811	14,196
	BPAT	PWRX	3,528	0
	BPAT	SCL	5,373	5,131
	BPAT	TPWR	16,057	15,829
	CISO	AVA	0	0
	CISO	AZPS	49,393	38,601
	CISO	BANC	84,959	95,009
	CISO	BPAT	27,082	39,089
	CISO	LADWP	25,560	18,418
February	CISO	NEVP	15,413	12,491
	CISO	PACW	13,662	48,533
	CISO	PGE	34,590	55,451
	CISO	PSEI	38,846	1,359
	CISO	PWRX	156,436	177,859
	CISO	SRP	75,011	61,520
	CISO	TEPC	0	0
	CISO	TIDC	10,500	11,459
	CISO	WALC	24,173	15,975

	EPE	AZPS	176	0
February	EPE	PNM	15,754	14,474
	EPE	TEPC	32,660	33,494
	IPCO	AVA	27,522	28,978
	IPCO	BPAT	4,077	2,460
	IPCO	NEVP	36,984	42,746
	IPCO	NWMT	749	902
	IPCO	PACE	24,359	10,179
	IPCO	PACW	15,462	20,470
	IPCO	PSEI	17,647	18,613
	IPCO	SCL	14,874	14,514
	LADWP	AZPS	4,677	6,176
	LADWP	BPAT	0	0
	LADWP	CISO	45,060	48,242
	LADWP	NEVP	21,019	21,289
	LADWP	PACE	18,448	15,204
	LADWP	TEPC	0	0
	LADWP	WALC	5,145	4,796
	NEVP	AZPS	0	0
	NEVP	BPAT	0	0
	NEVP	CISO	191,316	189,122
	NEVP	IPCO	18,965	16,977
	NEVP	LADWP	23,869	25,305
	NEVP	PACE	40,892	40,005
	NEVP	WALC	48,677	52,782
	NWMT	AVA	27,805	24,104
	NWMT	BPAT	6,778	3,946
	NWMT	IPCO	11,781	11,501
	NWMT	PACE	17,584	9,965
February	NWMT	PACW	34	0
	NWMT	PGE	914	0
	NWMT	PSEI	111	0

	NWMT	TPWR	0	0
February	PACE	AZPS	204,001	209,025
	PACE	IPCO	58,357	67,816
	PACE	LADWP	20,884	20,117
	PACE	NEVP	146,023	145,614
	PACE	NWMT	9,533	12,891
	PACE	PACW	86,215	89,834
	PACE	SRP	0	0
	PACE	TEPC	6,789	7,665
	PACW	AVA	3,311	2,781
	PACW	AVRN	12,768	24,022
	PACW	BPAT	4,909	2,611
	PACW	CISO	32,706	54,843
	PACW	IPCO	23,979	11,014
	PACW	NWMT	2	0
	PACW	PGE	43,254	42,014
	PACW	PSEI	29,006	33,895
	PACW	SCL	1,946	1,880
	PGE	AVA	0	0
	PGE	AVRN	2,782	4,316
	PGE	BPAT	18,573	17,988
	PGE	CISO	14,042	14,099
	PGE	NWMT	123	0
	PGE	PACW	22,892	22,074
	PGE	PSEI	106	254
	PGE	SCL	1,436	1,316
	PGE	TPWR	0	0
	PNM	AZPS	14,290	22,018
February	PNM	EPE	7,517	7,337
	PNM	SRP	2,190	3,413
	PNM	TEPC	10,935	7,628
	PSEI	AVA	17	0

	PSEI	BPAT	17,730	16,976
February	PSEI	CISO	21,082	3,586
	PSEI	IPCO	303	434
	PSEI	NWMT	1,218	0
	PSEI	PACW	7,652	5,097
	PSEI	PGE	349	321
	PSEI	PWRX	21,066	21,661
	PSEI	SCL	43,625	37,923
	PSEI	TPWR	16,445	17,443
	PWRX	BPAT	3,676	0
	PWRX	CISO	0	0
	PWRX	PSEI	3,313	4,386
	SCL	AVA	0	0
	SCL	AVRN	658	1,060
	SCL	BPAT	843	342
	SCL	IPCO	707	1,097
	SCL	PACW	174	185
	SCL	PGE	306	348
	SCL	PSEI	1,861	2,533
	SRP	AZPS	5,532	3,560
	SRP	CISO	63,869	64,875
	SRP	PACE	0	0
	SRP	PNM	245	378
	SRP	TEPC	5,960	3,360
	SRP	WALC	1,184	292
	TEPC	AZPS	190	0
February	TEPC	CISO	912	1,098
	TEPC	EPE	9,761	8,196
	TEPC	LADWP	0	0
	TEPC	PACE	35	13
	TEPC	PNM	11,018	10,731
	TEPC	SRP	7,447	6,155

	TEPC	WALC	53,261	54,759
February	TIDC	BANC	44	0
	TIDC	CISO	9,938	9,882
	TPWR	AVA	0	0
	TPWR	BPAT	2,831	2,847
	TPWR	NWMT	0	0
	TPWR	PGE	0	0
	TPWR	PSEI	7,011	5,456
	WALC	AZPS	4,252	4,763
	WALC	CISO	44,990	53,788
	WALC	LADWP	2,163	1,434
	WALC	NEVP	2,034	1,885
	WALC	SRP	6,844	9,549
	WALC	TEPC	46,803	44,040
March	AVA	AVRN	5,418	6,795
	AVA	BPAT	6,241	6,726
	AVA	CISO	0	0
	AVA	IPCO	12,891	15,047
	AVA	NWMT	17,297	21,997
	AVA	PACW	3,435	5,537
	AVA	PGE	0	0
	AVA	PSEI	0	0
	AVA	SCL	0	0
	AVA	TPWR	0	0
	AVRN	AVA	11,512	11,005
	AVRN	BPAT	37,641	37,394
	AVRN	PACW	20,502	30,480
	AVRN	PGE	8,657	7,480
	AVRN	SCL	10,236	9,273
	AZPS	CISO	85,915	74,566
	AZPS	EPE	1,005	0
	AZPS	LADWP	3,606	3,946

	AZPS	NEVP	0	0
March	AZPS	PACE	63,919	54,803
	AZPS	PNM	50,429	43,915
	AZPS	SRP	29,265	28,908
	AZPS	TEPC	747	328
	AZPS	WALC	4,152	4,213
	BANC	BPAT	0	0
	BANC	CISO	17,745	19,020
	BANC	TIDC	51	0
	BPAT	AVA	6,705	6,175
	BPAT	AVRN	11,745	14,019
	BPAT	BANC	0	0
	BPAT	CISO	35,468	52,304
	BPAT	IPCO	4,872	122
	BPAT	LADWP	0	0
	BPAT	NEVP	0	0
	BPAT	NWMT	5,670	347
	BPAT	PACW	3,364	290
	BPAT	PGE	13,360	14,092
	BPAT	PSEI	30,120	24,292
	BPAT	PWRX	2,734	0
	BPAT	SCL	5,069	4,066
	BPAT	TPWR	13,576	11,705
	CISO	AVA	0	0
	CISO	AZPS	96,723	82,089
March	CISO	BANC	143,592	144,415
	CISO	BPAT	22,885	39,775
	CISO	LADWP	32,012	26,669
	CISO	NEVP	38,703	27,247
	CISO	PACW	16,455	45,813
	CISO	PGE	84,421	103,320
	CISO	PSEI	73,834	8,882

	CISO	PWRX	215,688	239,505
March	CISO	SRP	90,997	82,324
	CISO	TEPC	25	6
	CISO	TIDC	14,652	14,465
	CISO	WALC	28,253	20,916
	EPE	AZPS	1,305	0
	EPE	PNM	19,172	18,132
	EPE	TEPC	19,099	18,096
	IPCO	AVA	2,572	2,219
	IPCO	BPAT	7,033	2,685
	IPCO	NEVP	127,575	126,629
	IPCO	NWMT	7,213	6,384
	IPCO	PACE	36,466	34,643
	IPCO	PACW	16,665	20,206
	IPCO	PSEI	36,264	32,048
	IPCO	SCL	13,330	12,528
	LADWP	AZPS	9,784	15,885
	LADWP	BPAT	0	0
	LADWP	CISO	54,859	59,346
	LADWP	NEVP	12,458	11,631
	LADWP	PACE	21,089	18,900
	LADWP	TEPC	0	0
	LADWP	WALC	8,234	7,438
	NEVP	AZPS	0	0
	NEVP	BPAT	0	0
March	NEVP	CISO	190,328	188,056
	NEVP	IPCO	30,227	23,101
	NEVP	LADWP	37,870	40,215
	NEVP	PACE	73,240	63,632
	NEVP	WALC	56,209	70,403
	NWMT	AVA	28,774	24,890
	NWMT	BPAT	4,713	3,023

	NWMT	IPCO	12,398	12,830
March	NWMT	PACE	21,262	22,758
	NWMT	PACW	3	0
	NWMT	PGE	288	0
	NWMT	PSEI	225	0
	NWMT	TPWR	0	0
	PACE	AZPS	131,485	129,095
	PACE	IPCO	98,536	104,801
	PACE	LADWP	29,617	29,033
	PACE	NEVP	37,463	37,669
	PACE	NWMT	15,928	15,440
	PACE	PACW	57,550	59,755
	PACE	SRP	0	0
	PACE	TEPC	11,131	11,744
	PACW	AVA	16,724	19,698
	PACW	AVRN	28,300	41,562
	PACW	BPAT	4,844	3,659
	PACW	CISO	52,295	110,560
	PACW	IPCO	20,816	18,923
	PACW	NWMT	2	0
	PACW	PGE	55,398	51,179
	PACW	PSEI	52,969	52,154
	PACW	SCL	2,413	2,079
	PGE	AVA	0	0
March	PGE	AVRN	5,768	6,749
	PGE	BPAT	29,429	29,049
	PGE	CISO	34,465	33,737
	PGE	NWMT	85	0
	PGE	PACW	18,625	22,005
	PGE	PSEI	346	329
	PGE	SCL	2,021	1,782
	PGE	TPWR	0	0

	PNM	AZPS	22,312	24,131
March	PNM	EPE	12,342	11,200
	PNM	SRP	2,730	2,756
	PNM	TEPC	9,600	8,062
	PSEI	AVA	0	0
	PSEI	BPAT	16,188	17,326
	PSEI	CISO	47,681	2,246
	PSEI	IPCO	866	1,305
	PSEI	NWMT	56	0
	PSEI	PACW	4,387	6,792
	PSEI	PGE	75	129
	PSEI	PWRX	31,563	28,257
	PSEI	SCL	43,522	40,637
	PSEI	TPWR	14,817	17,146
	PWRX	BPAT	5,029	0
	PWRX	CISO	0	0
	PWRX	PSEI	1,753	4,857
	SCL	AVA	1	0
	SCL	AVRN	1,053	1,876
	SCL	BPAT	1,236	895
	SCL	IPCO	1,216	1,696
	SCL	PACW	198	333
	SCL	PGE	343	502
	SCL	PSEI	4,189	5,574
March	SRP	AZPS	5,867	7,383
	SRP	CISO	45,021	39,297
	SRP	PACE	0	0
	SRP	PNM	1,445	1,768
	SRP	TEPC	14,241	9,769
	SRP	WALC	1,617	1,677
	TEPC	AZPS	888	5
	TEPC	CISO	3,132	2,375

March	TEPC	EPE	15,047	14,318
	TEPC	LADWP	0	0
	TEPC	PACE	88	103
	TEPC	PNM	25,601	21,324
	TEPC	SRP	16,253	16,184
	TEPC	WALC	55,759	54,173
	TIDC	BANC	152	0
	TIDC	CISO	9,475	9,229
	TPWR	AVA	0	0
	TPWR	BPAT	2,240	2,262
	TPWR	NWMT	0	0
	TPWR	PGE	0	0
	TPWR	PSEI	12,225	9,702
	WALC	AZPS	8,271	11,058
	WALC	CISO	34,228	35,993
	WALC	LADWP	5,775	3,294
	WALC	NEVP	5,791	6,021
	WALC	SRP	9,433	10,683
	WALC	TEPC	45,995	51,829

APPENDIX 3: Minimum & Maximum Flexible Ramping Requirements

Month	BAA	Direction	Minimum requirement	Maximum requirement
January	*AVA*	up	0	97
	AVRN	up	0	381
	AZPS	up	0	384
	BANC	up	7	93
	BPAT	up	0	398
	CISO	up	256	2,791
	EPE	up	0	96
	IPCO	up	0	193
	LADWP	up	0	403
	NEVP	up	0	898
	NWMT	up	0	145
	PACE	up	0	695
	PACW	up	2	187
	PGE	up	13	226
	PNM	up	0	416
	PSEI	up	6	215
	PWRX	up	0	256
	SCL	up	0	28
	SRP	up	0	383
	TEPC	up	0	178
	TIDC	up	1	13
	TPWR	up	0	15
	WALC	up	0	58
	ALL EIM	**up**	**0**	**4,806**
	AVA	down	0	105
	AVRN	down	0	351
	AZPS	down	0	449
	BANC	down	0	133
January	*BPAT*	down	0	436
	CISO	down	0	1,466
	EPE	down	0	87
	IPCO	down	0	244

January	*LADWP*	down	0	282
	NEVP	down	0	633
	NWMT	down	0	160
	PACE	down	36	862
	PACW	down	0	226
	PGE	down	0	232
	PNM	down	0	366
	PSEI	down	0	243
	PWRX	down	0	285
	SCL	down	0	31
	SRP	down	0	261
	TEPC	down	0	166
	TIDC	down	0	18
	TPWR	down	0	18
	WALC	down	0	65
	ALL EIM	**down**	**0**	**2,364**
February	*AVA*	up	0	106
	AVRN	up	0	364
	AZPS	up	0	536
	BANC	up	0	112
	BPAT	up	0	38
	CISO	up	0	3,291
	EPE	up	0	96
	IPCO	up	0	197
	LADWP	up	0	439
	NEVP	up	0	744
	NWMT	up	0	152
	PACE	up	0	708
	PACW	up	0	185
	PGE	up	0	226
	PNM	up	0	414
	PSEI	up	4	212
	PWRX	up	0	284
	SCL	up	0	44
	SRP	up	0	361
	TEPC	up	2	220

	TIDC	up	0	17
	TPWR	up	0	26
February	*WALC*	up	0	58
	ALL WEIM	**up**	**0**	**4,488**
	AVA	down	0	105
	AVRN	down	0	364
	AZPS	down	0	346
	BANC	down	0	133
	BPAT	down	0	373
	CISO	down	0	1,744
	EPE	down	0	83
	IPCO	down	0	244
	LADWP	down	0	289
	NEVP	down	0	721
	NWMT	down	0	158
	PACE	down	0	862
	PACW	down	0	253
	PGE	down	0	232
	PNM	down	16	366
	PSEI	down	0	239
	PWRX	down	0	277
	SCL	down	0	50
	SRP	down	0	261
	TEPC	down	0	181
	TIDC	down	0	18
	TPWR	down	0	26
	WALC	down	0	87
	ALL EIM	**down**	**0**	**2,785**
March	*AVA*	up	0	106
	AVRN	up	7	381
	AZPS	up	54	536
	BANC	up	0	112
	BPAT	up	0	418
	CISO	up	0	3,291
	EPE	up	0	96

March	*IPCO*	up	0	197
	LADWP	up	0	346
	NEVP	up	0	779
	NWMT	up	0	150
	PACE	up	0	708
	PACW	up	0	173
	PGE	up	0	204
	PNM	up	44	410
	PSEI	up	10	218
	PWRX	up	0	263
	SCL	up	0	44
	SRP	up	0	354
	TEPC	up	0	226
	TIDC	up	0	17
	TPWR	up	0	26
	WALC	up	0	58
	ALL WEIM	**up**	**516**	**4,872**
	AVA	down	0	105
	AVRN	down	0	364
	AZPS	down	0	328
	BANC	down	0	133
	BPAT	down	0	436
	CISO	down	0	1,744
	EPE	down	0	74
	IPCO	down	0	239
	LADWP	down	0	289
	NEVP	down	0	721
	NWMT	down	0	127
	PACE	down	0	862
March	*PACW*	down	0	253
	PGE	down	0	232
	PNM	down	26	351
	PSEI	down	5	243
	PWRX	down	0	240
	SCL	down	0	45
	SRP	down	0	261

	TEPC	down	0	175
	TIDC	down	0	18
	TPWR	down	0	26
	WALC	down	0	66
	ALL WEIM	**down**	**0**	**2,834**