



WESTERN ENERGY IMBALANCE MARKET BENEFITS REPORT

Fourth Quarter 2024 ■ ■ ■

Prepared by: Market Performance and Advanced Analytics

January 30, 2025

CONTENTS

EXECUTIVE SUMMARY.....	3
BACKGROUND	4
■ WEIM ECONOMIC BENEFITS IN Q4 2024.....	4
CUMULATIVE ECONOMIC BENEFITS SINCE INCEPTION.....	5
INTER-REGIONAL TRANSFERS	6
WHEEL-THROUGH TRANSFERS.....	8
REDUCED RENEWABLE CURTAILMENT AND GHG REDUCTIONS.....	14
FLEXIBLE RAMPING PROCUREMENT DIVERSITY SAVINGS	16
CONCLUSION.....	17
APPENDIX 1: GLOSSARY OF ABBREVIATIONS	18
APPENDIX 2: WEIM TRANSFER VOLUME (MWH)	19
APPENDIX 3: MINIMUM & MAXIMUM FLEXIBLE RAMPING REQUIREMENTS	35

EXECUTIVE SUMMARY

Gross benefits from WEIM since November 2014

\$6.62 billion

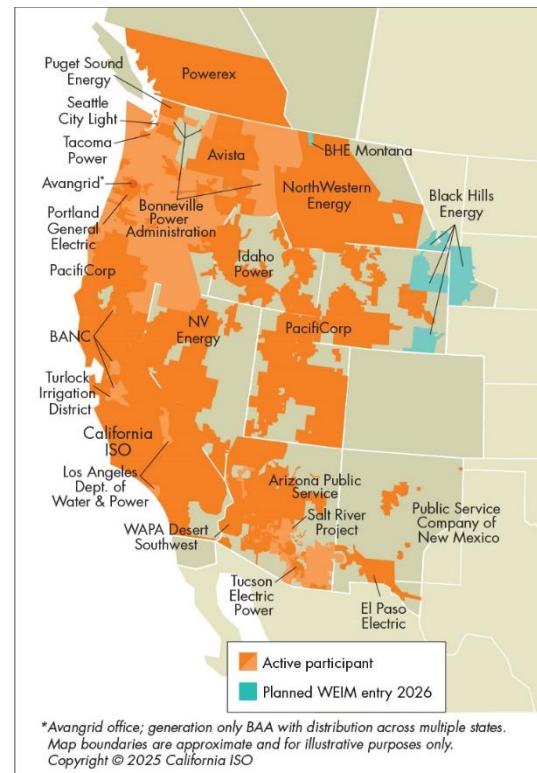
This report presents the benefits associated with participation in the Western Energy Imbalance Market (WEIM).

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.

Q4 2024 Gross Benefits by Participant (entry year)

(\$ millions)

Arizona Public Service (2016)	\$4.25
AVANGRID (2023)	\$8.73
Avista (2022)	\$2.66
Balancing Authority of Northern California (2019)	\$57.99
Bonneville Power Administration (2022)	\$4.61
California ISO (2014)	\$12.65
El Paso Electric (2023)	\$3.68
Idaho Power Company (2018)	\$5.31
Los Angeles Dept. of Water & Power (2021)	\$34.21
NV Energy (2015)	\$73.08
NorthWestern Energy (2021)	\$12.90
PacifiCorp (2014)	\$46.58
Portland General Electric (2017)	\$8.17
Public Service Company New Mexico (2021)	\$23.35
Puget Sound Energy (2016)	\$11.71
Powerex (2018)	\$0.84
Seattle City Light (2020)	\$19.25
Salt River Project (2020)	\$11.95
Tacoma Power (2022)	\$3.97
Tucson Electric Power (2022)	\$4.61
Turlock Irrigation District (2021)	\$1.09
WAPA Desert Southwest Region (2023)	\$22.66
Total	\$374.25

**2024 Q4 BENEFITS****ECONOMICAL****\$374.25 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**13,038**

Metric tons of CO₂** avoided curtailments

OPERATIONAL**59%**

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 Q4 2024

Table 2 shows the estimated WEIM gross benefits by each region per month¹. The monthly savings presented show \$134.73 million for October, \$135.52 million for November and \$104.00 million for December with a total estimated benefit of \$374.25 million for this quarter². 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.

<i>Region</i>	October	November	December	Total
<i>APS</i>	\$2.85	\$0.29	\$1.11	\$4.25
<i>AVRN</i>	\$3.12	\$3.61	\$2.00	\$8.73
<i>AVA</i>	\$1.20	\$0.96	\$0.50	\$2.66
<i>BANC</i>	\$16.02	\$27.38	\$14.59	\$57.99
<i>BPA</i>	\$1.93	\$1.28	\$1.40	\$4.61
<i>CISO</i>	\$9.83	\$2.18	\$0.64	\$12.65
<i>EPE</i>	\$1.42	\$1.44	\$0.82	\$3.68
<i>IPCO</i>	\$2.00	\$1.46	\$1.85	\$5.31
<i>LADWP</i>	\$10.80	\$12.58	\$10.83	\$34.21
<i>NVE</i>	\$30.60	\$23.93	\$18.55	\$73.08
<i>NWMT</i>	\$4.33	\$3.99	\$4.58	\$12.90
<i>PAC</i>	\$13.72	\$16.34	\$16.52	\$46.58
<i>PGE</i>	\$3.02	\$2.53	\$2.62	\$8.17
<i>PNM</i>	\$6.17	\$10.78	\$6.40	\$23.35
<i>PSE</i>	\$3.71	\$4.46	\$3.54	\$11.71
<i>PWRX</i>	\$0.27	\$0.41	\$0.16	\$0.84
<i>SCL</i>	\$9.94	\$3.98	\$5.33	\$19.25
<i>SRP</i>	\$4.27	\$4.81	\$2.87	\$11.95
<i>TPWR</i>	\$2.02	\$1.15	\$0.80	\$3.97
<i>TEP</i>	\$2.28	\$1.40	\$0.93	\$4.61
<i>TID</i>	\$0.78	\$0.18	\$0.13	\$1.09
<i>WALC</i>	\$4.45	\$10.38	\$7.83	\$22.66
Total	\$134.73	\$135.52	\$104.00	\$374.25

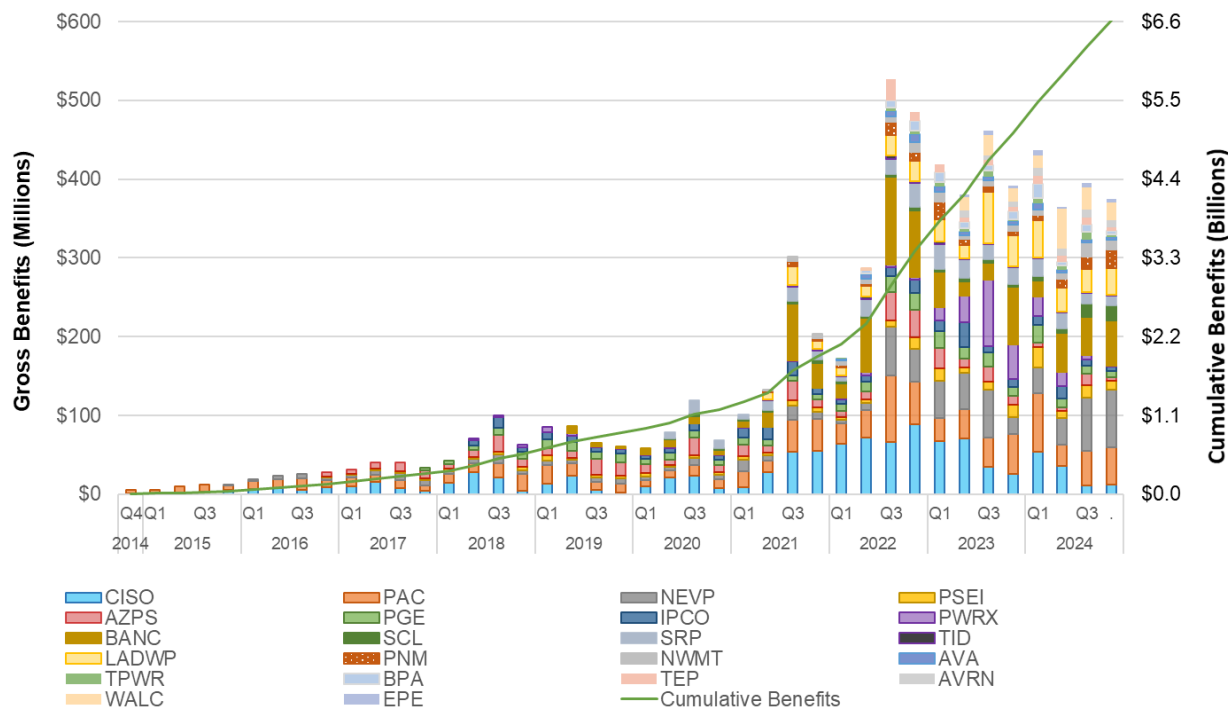
TABLE 1: Q4 2024 benefits in millions USD

CUMULATIVE ECONOMIC BENEFITS SINCE INCEPTION

Since the start of the WEIM in November 2014, the cumulative economic benefits of the market have totaled \$6.62 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

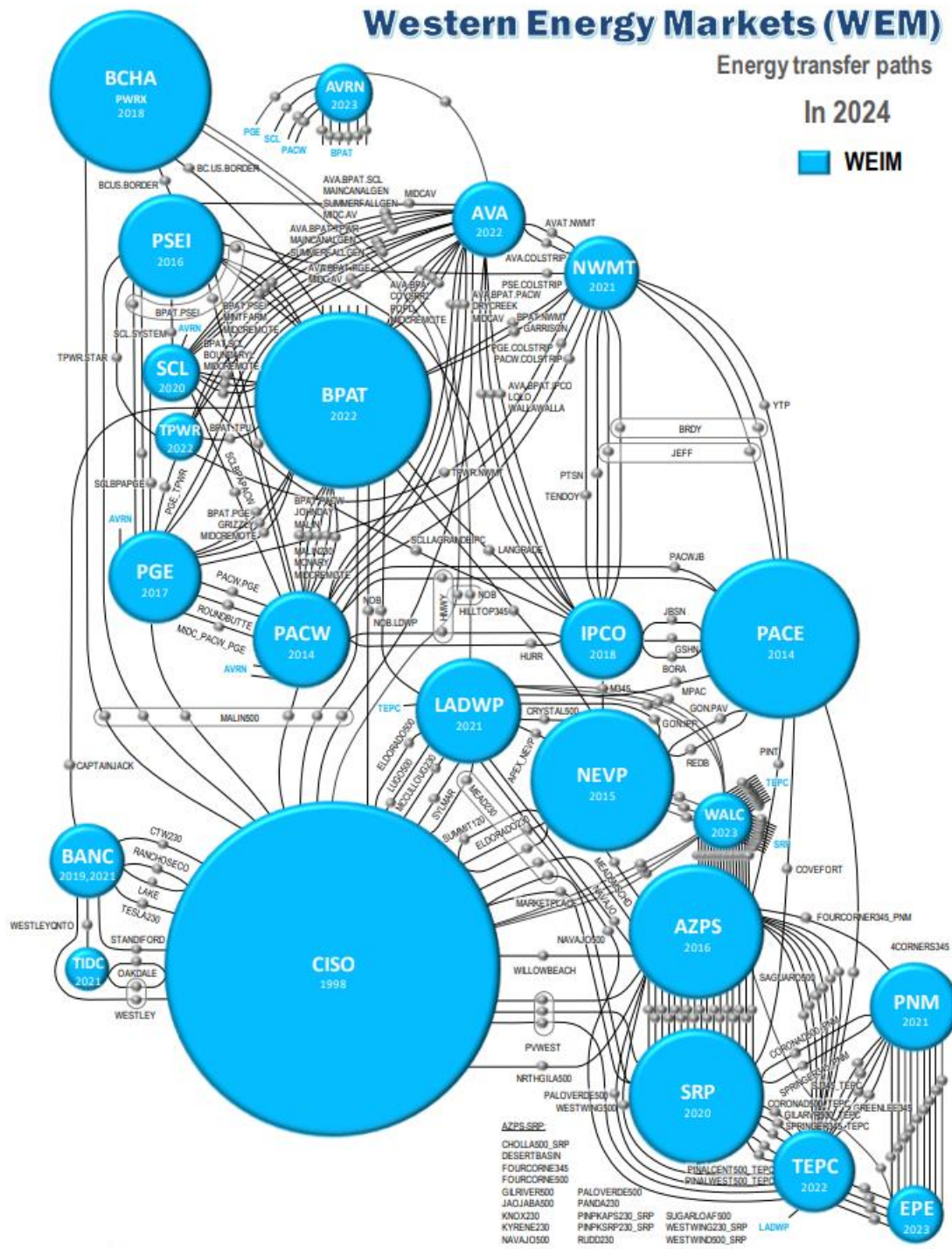
A significant contributor to WEIM benefits is transfers across balancing areas, providing access to lower cost supply, while factoring in the cost of compliance with greenhouse gas (GHG) emissions regulations when energy is transferred into the ISO. As such, the transfer volumes are a good indicator 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.

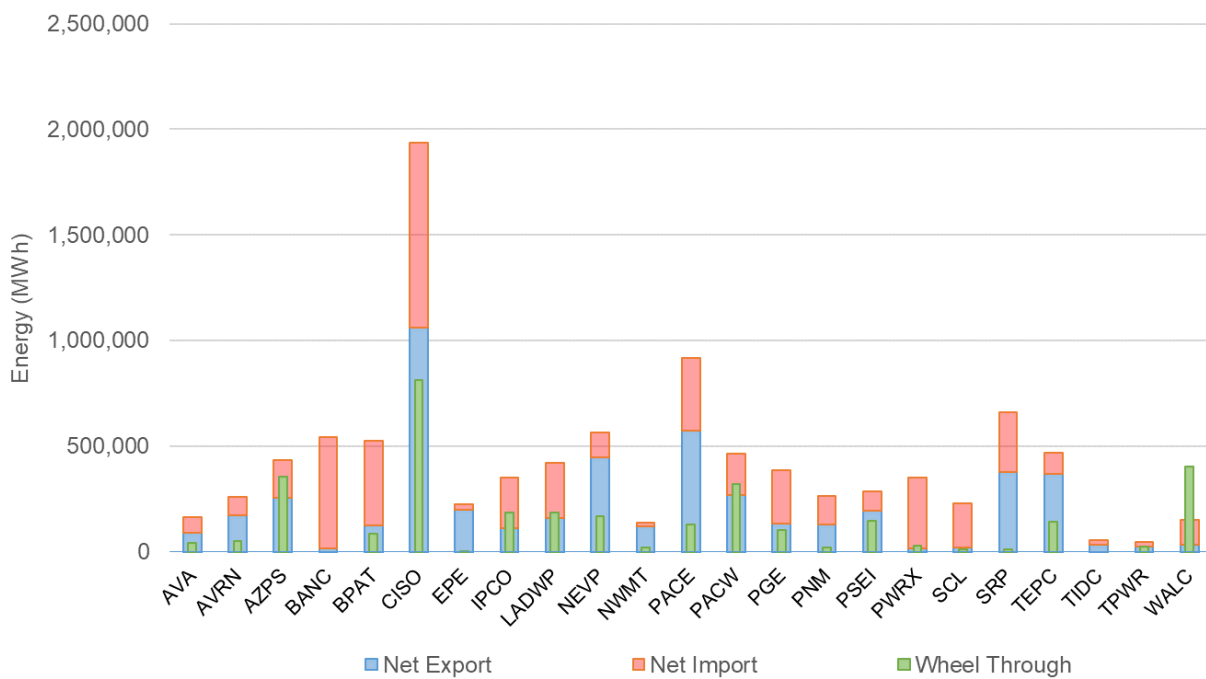
This volume reflects the total wheel-through transfers for each WEIM BAA, regardless of the potential paths used to wheel through. The net imports and exports estimated in this section reflect the overall volume of net imports and exports; in contrast, the imports and exports provided in Table 2 reflect 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	90,887	73,041	40,218
AVRN	173,872	86,219	50,095
AZPS	256,147	179,827	356,176
BANC	13,770	530,916	-
BPAT	122,638	403,793	85,059
CISO	1,060,806	877,127	814,970
EPE	198,771	26,612	381
IPCO	111,226	237,853	184,624
LADWP	158,911	262,430	183,805

NEVP	446,978	116,903	166,564
NWMT	120,162	18,482	20,005
PACE	571,584	345,838	129,548
PACW	268,197	194,325	320,376
PGE	133,688	251,389	102,048
PNM	128,572	133,945	21,031
PSEI	194,539	91,702	146,867
PWRX	16,902	336,184	27,293
SCL	19,341	210,767	10,562
SRP	375,707	286,095	11,054
TEPC	367,927	100,356	140,435
TIDC	33,657	19,412	-
TPWR	25,068	19,578	22,504
WALC	32,639	119,195	401,898

TABLE 2: Estimated wheel-through transfers in Q4 2024

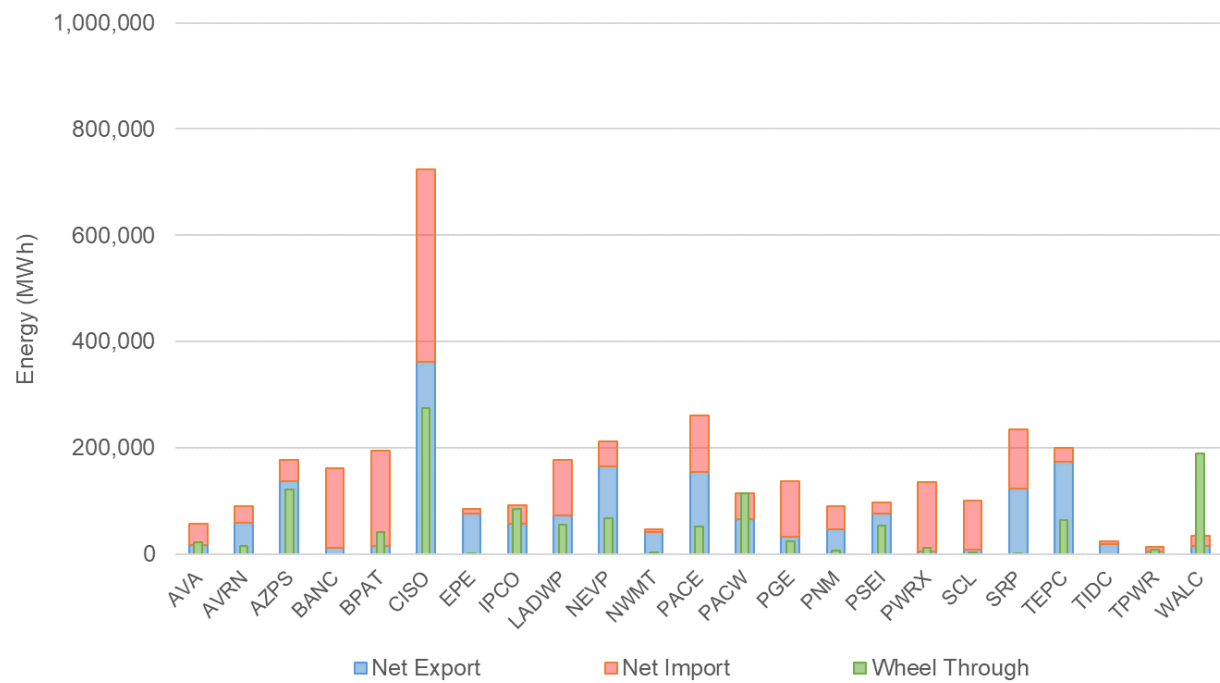


GRAPH 3: Estimated wheel-through transfers in Q4 2024

BAA	Net Export	Net Import	Wheel Through
AVA	15,760	40,517	21,510
AVRN	57,768	32,070	15,397

AZPS	137,163	39,963	121,786
BANC	11,279	150,089	-
BPAT	14,881	179,837	41,307
CISO	362,204	362,243	274,861
EPE	76,432	7,370	0
IPCO	56,996	34,619	85,010
LADWP	72,186	104,478	55,096
NEVP	164,044	47,029	67,695
NWMT	40,539	5,894	2,085
PACE	153,883	106,891	51,135
PACW	64,745	48,748	114,417
PGE	33,121	102,973	23,337
PNM	46,787	42,258	6,101
PSEI	75,199	21,520	53,299
PWRX	3,796	132,138	10,599
SCL	7,231	93,890	2,665
SRP	122,402	112,530	1,681
TEPC	172,930	26,900	64,102
TIDC	18,073	4,791	-
TPWR	3,977	9,798	7,803
WALC	14,268	19,117	188,751

TABLE 3: Estimated wheel-through transfers in October 2024

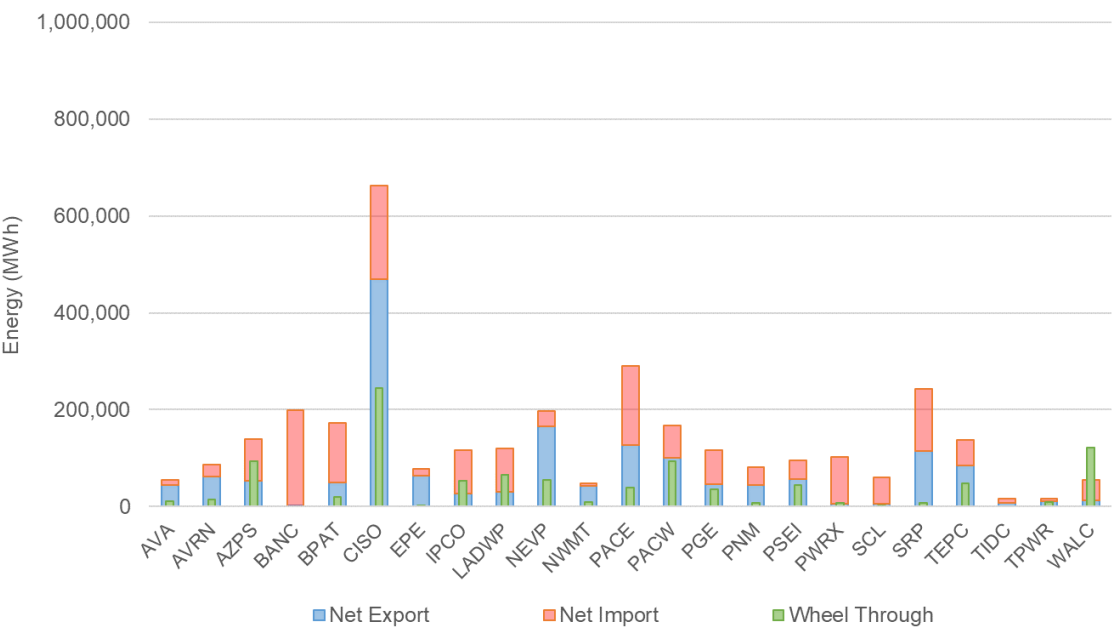


GRAPH 4: Estimated wheel-through transfers in October 2024

BAA	Net Export	Net Import	Wheel Through
AVA	44,575	10,964	10,644
AVRN	61,737	25,304	15,320
AZPS	54,303	84,790	93,149
BANC	1,218	198,370	-
BPAT	49,348	122,645	19,439
CISO	469,151	193,041	244,182
EPE	64,018	13,543	153
IPCO	26,301	89,954	52,759
LADWP	30,899	88,886	65,597
NEVP	165,969	31,790	55,639
NWMT	42,104	5,817	8,942

PACE	126,499	163,903	40,197
PACW	100,984	66,790	93,151
PGE	45,971	70,626	36,236
PNM	45,066	36,110	7,384
PSEI	56,411	38,580	44,317
PWRX	6,225	95,909	7,450
SCL	5,842	54,464	2,861
SRP	115,177	127,710	8,283
TEPC	85,506	52,452	47,820
TIDC	6,954	9,930	-
TPWR	10,906	6,040	10,316
WALC	13,952	41,499	121,540

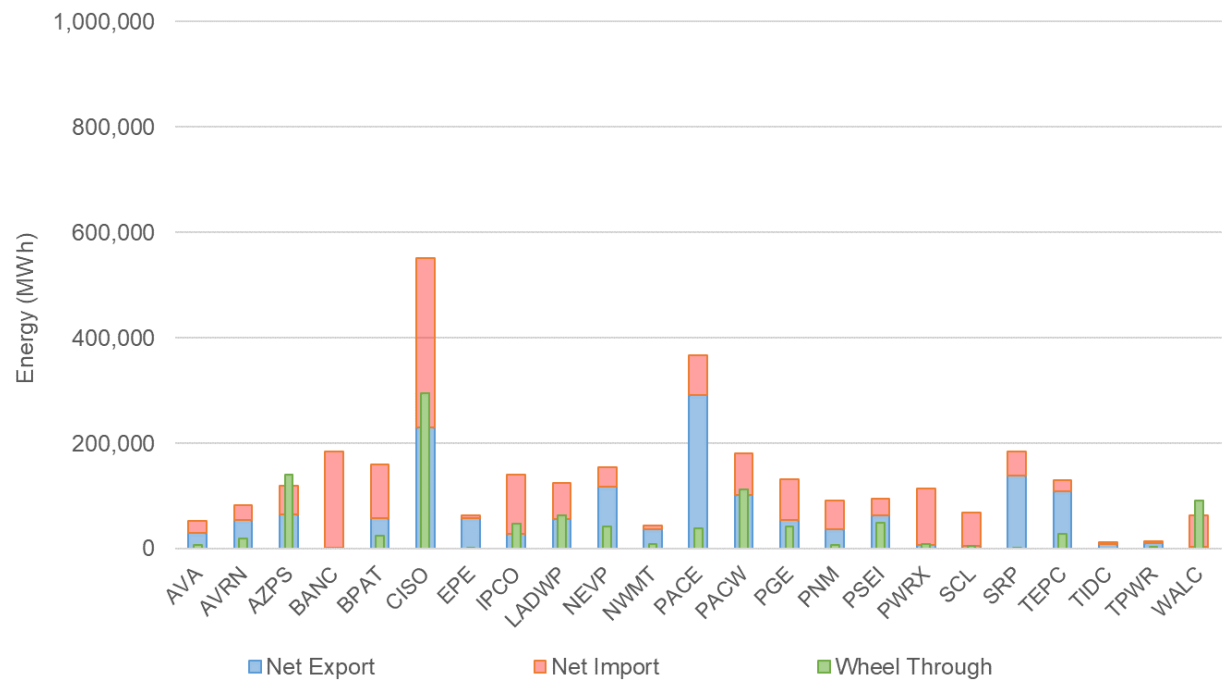
TABLE 4: Estimated wheel-through transfers in November 2024



GRAPH 5: Estimated wheel-through transfers in November 2024

BAA	Net Export	Net Import	Wheel Through
AVA	30,552	21,560	8,064
AVRN	54,367	28,844	19,378
AZPS	64,681	55,074	141,241
BANC	1,274	182,457	-
BPAT	58,408	101,312	24,313
CISO	229,451	321,843	295,928
EPE	58,321	5,699	227
IPCO	27,929	113,280	46,856
LADWP	55,826	69,066	63,112
NEVP	116,964	38,084	43,229
NWMT	37,520	6,770	8,978
PACE	291,202	75,044	38,216
PACW	102,467	78,786	112,808
PGE	54,595	77,790	42,475
PNM	36,719	55,578	7,545
PSEI	62,930	31,602	49,251
PWRX	6,882	108,138	9,244
SCL	6,268	62,413	5,036
SRP	138,128	45,855	1,090
TEPC	109,491	21,004	28,513
TIDC	8,630	4,691	-
TPWR	10,185	3,739	4,384
WALC	4,419	58,578	91,607

TABLE 5: Estimated wheel-through transfers in December 2024



GRAPH 6: Estimated wheel-through transfers in December 2024

■ 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 Q4 2024 was calculated to be 10,241 MWh (October) + 14,376 MWh (November) + 5,845 MWh (December) = 30,462 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 CO₂/MWh, avoided curtailments displaced an estimated 13,038 metric tons of CO₂ for Q4 2024. 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 CO₂, 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
Total		2,437,182	1,043,034

TABLE 6: Total reduction in curtailment of renewable energy and associated reductions in CO₂

■ 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.

	October		November		December	
<i>Direction</i>	Up	Down	Up	Down	Up	Down
<i>Average MW saving</i>	1,950	2,052	1,954	2,080	1,822	1,961
<i>Sum of BAA requirements</i>	3,521	3,176	3,551	3,238	3,378	3,138
<i>Percentage savings</i>	55%	65%	55%	64%	54%	63%

Table 7: Flexible ramping procurement diversity savings in Q4 2024

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 1,043,034 metric tons of CO₂, roughly the equivalent of avoiding the emissions from 219,293 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)
<i>October</i>	AVA	AVRN	4,326	5,489
	AVA	BPAT	13,785	12,158
	AVA	CISO	0	0
	AVA	IPCO	8,021	10,085
	AVA	NWMT	2,450	4,307
	AVA	PACW	3,801	5,232
	AVA	PGE	0	0
	AVA	PSEI	25	0
	AVA	SCL	8	0
	AVA	TPWR	0	0
	AVRN	AVA	3,535	2,698
	AVRN	BPAT	39,105	36,472
	AVRN	PACW	18,333	21,132
	AVRN	PGE	10,108	8,774
	AVRN	SCL	4,828	4,090
	AZPS	CISO	158,121	141,056
	AZPS	EPE	2,157	0
	AZPS	LADWP	26,571	27,646
	AZPS	NEVP	0	0
	AZPS	PACE	63,576	51,546
	AZPS	PNM	12,114	15,962
	AZPS	SRP	17,662	21,779
	AZPS	TEPC	359	29
	AZPS	WALC	1,527	931
	BANC	BPAT	0	0
	BANC	CISO	12,762	11,279
	BANC	TIDC	74	0
	BPAT	AVA	3,487	3,043

October	BPAT	AVRN	5,329	5,850
	BPAT	BANC	0	0
	BPAT	CISO	4,924	8,512
	BPAT	IPCO	3,536	1,574
	BPAT	LADWP	0	0
	BPAT	NEVP	0	0
	BPAT	NWMT	4,364	1,783
	BPAT	PACW	3,043	1,440
	BPAT	PGE	10,412	10,245
	BPAT	PSEI	8,117	7,816
	BPAT	PWRX	5,488	0
	BPAT	SCL	12,039	10,715
	BPAT	TPWR	5,119	5,209
	CISO	AVA	0	0
	CISO	AZPS	44,604	40,341
	CISO	BANC	142,544	150,089
	CISO	BPAT	67,509	92,617
	CISO	LADWP	49,596	40,997
	CISO	NEVP	19,023	16,282
	CISO	PACW	9,031	30,075
October	CISO	PGE	47,595	54,813
	CISO	PSEI	90,482	3,192
	CISO	PWRX	115,057	129,919
	CISO	SRP	72,249	64,396
	CISO	TEPC	0	0
	CISO	TIDC	3,966	4,791
	CISO	WALC	12,238	9,553
	EPE	AZPS	267	0
	EPE	PNM	10,142	9,284
	EPE	TEPC	70,144	67,148
	IPCO	AVA	37,451	32,904
	IPCO	BPAT	5,465	4,420

October	IPCO	NEVP	16,672	21,229
	IPCO	NWMT	227	122
	IPCO	PACE	12,634	16,131
	IPCO	PACW	40,056	39,505
	IPCO	PSEI	12,626	15,133
	IPCO	SCL	13,633	12,562
	LADWP	AZPS	754	1,143
	LADWP	BPAT	0	0
	LADWP	CISO	54,101	57,480
	LADWP	NEVP	28,378	21,427
	LADWP	PACE	60,118	46,965
	LADWP	TEPC	0	0
	LADWP	WALC	1,359	267
	NEVP	AZPS	0	0
	NEVP	BPAT	0	0
October	NEVP	CISO	105,605	94,001
	NEVP	IPCO	55,222	32,660
	NEVP	LADWP	42,247	52,284
	NEVP	PACE	51,223	37,357
	NEVP	WALC	13,562	15,437
	NWMT	AVA	22,755	20,136
	NWMT	BPAT	7,261	4,842
	NWMT	IPCO	10,383	11,370
	NWMT	PACE	7,001	6,010
	NWMT	PACW	0	0
	NWMT	PGE	22	0
	NWMT	PSEI	93	0
	NWMT	TPWR	321	267
	PACE	AZPS	52,468	59,473
	PACE	IPCO	61,096	47,088
	PACE	LADWP	10,603	16,693
	PACE	NEVP	34,517	37,209

October	PACE	NWMT	3,994	1,767
	PACE	PACW	52,005	42,781
	PACE	SRP	0	0
	PACE	TEPC	13	8
	PACW	AVA	4,383	3,247
	PACW	AVRN	18,141	28,607
	PACW	BPAT	15,683	11,993
	PACW	CISO	18,398	39,283
	PACW	IPCO	17,025	15,329
	PACW	NWMT	1	0
	PACW	PGE	52,345	51,753
	PACW	PSEI	28,991	27,191
	PACW	SCL	2,039	1,760
	PGE	AVA	1	0
	PGE	AVRN	4,487	6,083
October	PGE	BPAT	31,218	25,643
	PGE	CISO	8,251	8,996
	PGE	NWMT	181	0
	PGE	PACW	12,046	14,315
	PGE	PSEI	87	142
	PGE	SCL	1,483	1,279
	PGE	TPWR	40	1
	PNM	AZPS	48,729	45,906
	PNM	EPE	534	243
	PNM	SRP	2,420	2,522
	PNM	TEPC	4,602	4,216
	PSEI	AVA	6	0
	PSEI	BPAT	22,198	20,621
	PSEI	CISO	15,790	6,759
	PSEI	IPCO	603	1,523
	PSEI	NWMT	76	0
	PSEI	PACW	5,836	8,433

October	PSEI	PGE	59	69
	PSEI	PWRX	11,024	12,818
	PSEI	SCL	69,101	66,149
	PSEI	TPWR	11,130	12,126
	PWRX	BPAT	5,651	0
	PWRX	CISO	0	0
	PWRX	PSEI	10,952	14,395
	SCL	AVA	2	0
	SCL	AVRN	796	1,439
	SCL	BPAT	3,585	3,897
	SCL	IPCO	0	0
	SCL	PACW	155	254
	SCL	PGE	511	649
	SCL	PSEI	2,553	3,657
	SRP	AZPS	6,044	7,876
	SRP	CISO	116,489	110,972
	SRP	PACE	0	0
	SRP	PNM	282	574
	SRP	TEPC	4,136	1,742
	SRP	WALC	3,130	2,918
	TEPC	AZPS	244	0
	TEPC	CISO	5,217	6,029
	TEPC	EPE	8,019	7,127
	TEPC	LADWP	0	0
	TEPC	PACE	0	17
	TEPC	PNM	21,190	22,539
	TEPC	SRP	21,558	22,558
	TEPC	WALC	187,268	178,762
	TIDC	BANC	1,225	0
	TIDC	CISO	19,077	18,073
	TPWR	AVA	0	0
	TPWR	BPAT	7,221	8,479

<i>October</i>	TPWR	NWMT	0	0
	TPWR	PGE	22	8
	TPWR	PSEI	3,961	3,293
	WALC	AZPS	5,488	7,010
	WALC	CISO	133,218	134,665
	WALC	LADWP	28,187	21,953
	WALC	NEVP	18,432	18,577
	WALC	SRP	2,768	2,955
	WALC	TEPC	18,918	17,858
<i>November</i>	AVA	AVRN	4,232	4,616
	AVA	BPAT	7,543	5,633
	AVA	CISO	0	0
	AVA	IPCO	27,941	29,808
	AVA	NWMT	6,868	8,935
	AVA	PACW	5,922	6,228
	AVA	PGE	0	0
	AVA	PSEI	0	0
	AVA	SCL	0	0
	AVA	TPWR	0	0
	AVRN	AVA	5,621	4,788
	AVRN	BPAT	30,115	26,221
	AVRN	PACW	34,479	33,873
	AVRN	PGE	9,316	7,472
	AVRN	SCL	5,871	4,703
	AZPS	CISO	55,194	57,008
	AZPS	EPE	1,914	0
	AZPS	LADWP	10,954	10,448
	AZPS	NEVP	0	0
	AZPS	PACE	73,628	54,885
	AZPS	PNM	12,435	12,504
	AZPS	SRP	8,724	11,398
	AZPS	TEPC	725	521

<i>November</i>	AZPS	WALC	1,374	687
	BANC	BPAT	0	0
	BANC	CISO	814	1,200
	BANC	TIDC	88	18
	BPAT	AVA	2,484	1,251
	BPAT	AVRN	9,498	11,312
	BPAT	BANC	0	0
	BPAT	CISO	5,258	12,016
	BPAT	IPCO	4,016	1,630
	BPAT	LADWP	0	0
	BPAT	NEVP	0	0
	BPAT	NWMT	3,492	514
	BPAT	PACW	4,295	1,879
	BPAT	PGE	17,909	16,697
	BPAT	PSEI	11,855	11,021
	BPAT	PWRX	3,378	0
	BPAT	SCL	2,927	2,040
	BPAT	TPWR	11,206	10,427
	CISO	AVA	0	0
	CISO	AZPS	69,940	59,548
	CISO	BANC	194,638	196,652
	CISO	BPAT	19,969	43,934
	CISO	LADWP	43,005	44,181
<i>November</i>	CISO	NEVP	38,368	26,542
	CISO	PACW	28,675	52,964
	CISO	PGE	38,589	52,702
	CISO	PSEI	35,231	4,550
	CISO	PWRX	77,183	90,450
	CISO	SRP	120,788	109,417
	CISO	TEPC	0	0
	CISO	TIDC	9,980	9,912
	CISO	WALC	27,185	22,479

<i>November</i>	EPE	AZPS	729	0
	EPE	PNM	15,743	15,181
	EPE	TEPC	52,204	48,990
	IPCO	AVA	3,604	3,754
	IPCO	BPAT	2,217	1,381
	IPCO	NEVP	19,818	20,272
	IPCO	NWMT	581	1,247
	IPCO	PACE	28,796	25,740
	IPCO	PACW	16,380	12,167
	IPCO	PSEI	8,555	6,611
	IPCO	SCL	8,602	7,888
	LADWP	AZPS	2,949	3,263
	LADWP	BPAT	0	0
	LADWP	CISO	46,756	47,206
	LADWP	NEVP	19,291	18,813
	LADWP	PACE	29,447	25,047
	LADWP	TEPC	0	0
	LADWP	WALC	2,216	2,168
	NEVP	AZPS	0	0
	NEVP	BPAT	0	0
	NEVP	CISO	55,438	56,051
	NEVP	IPCO	34,032	27,294
	NEVP	LADWP	33,322	35,132
	NEVP	PACE	92,959	73,662
	NEVP	WALC	27,616	29,470
	NWMT	AVA	11,596	8,774
	NWMT	BPAT	9,298	2,821
	NWMT	IPCO	13,745	14,685
	NWMT	PACE	25,596	24,766
<i>November</i>	NWMT	PACW	74	0
	NWMT	PGE	207	0
	NWMT	PSEI	112	0

<i>November</i>	NWMT	TPWR	0	0
	PACE	AZPS	40,261	56,972
	PACE	IPCO	34,484	31,780
	PACE	LADWP	42,862	49,056
	PACE	NEVP	10,926	10,659
	PACE	NWMT	4,456	4,063
	PACE	PACW	19,500	14,167
	PACE	SRP	15	0
	PACE	TEPC	0	0
	PACW	AVA	2,440	3,042
	PACW	AVRN	9,686	18,725
	PACW	BPAT	5,507	4,264
	PACW	CISO	35,566	72,015
	PACW	IPCO	40,402	34,991
	PACW	NWMT	0	0
	PACW	PGE	31,176	29,270
	PACW	PSEI	33,808	30,429
	PACW	SCL	1,692	1,400
	PGE	AVA	0	0
	PGE	AVRN	3,064	4,639
	PGE	BPAT	25,269	24,150
	PGE	CISO	30,455	29,240
	PGE	NWMT	236	0
	PGE	PACW	19,613	22,583
	PGE	PSEI	649	369
	PGE	SCL	1,508	1,227
	PGE	TPWR	0	0
<i>November</i>	PNM	AZPS	31,400	33,378
	PNM	EPE	4,966	5,409
	PNM	SRP	1,491	2,201
	PNM	TEPC	9,079	11,463
	PSEI	AVA	0	0

November	PSEI	BPAT	23,558	23,838
	PSEI	CISO	54,314	1,166
	PSEI	IPCO	825	953
	PSEI	NWMT	90	0
	PSEI	PACW	9,911	15,706
	PSEI	PGE	125	160
	PSEI	PWRX	13,243	12,909
	PSEI	SCL	41,235	40,067
	PSEI	TPWR	5,083	5,929
	PWRX	BPAT	3,920	0
	PWRX	CISO	0	0
	PWRX	PSEI	11,583	13,675
	SCL	AVA	0	0
	SCL	AVRN	531	1,333
	SCL	BPAT	1,411	1,498
	SCL	IPCO	1,131	1,573
	SCL	PACW	187	375
	SCL	PGE	341	562
	SCL	PSEI	1,668	3,362
	SRP	AZPS	15,476	17,773
	SRP	CISO	97,576	85,592
	SRP	PACE	1	0
	SRP	PNM	1,597	2,202
	SRP	TEPC	13,452	9,764
	SRP	WALC	10,644	8,129
November	TEPC	AZPS	196	0
	TEPC	CISO	1,317	1,451
	TEPC	EPE	9,615	8,288
	TEPC	LADWP	0	0
	TEPC	PACE	6	0
	TEPC	PNM	13,495	13,608
	TEPC	SRP	11,141	9,873

<i>November</i>	TEPC	WALC	102,972	100,107
	TIDC	BANC	2,606	1,719
	TIDC	CISO	4,846	5,236
	TPWR	AVA	0	0
	TPWR	BPAT	7,274	8,344
	TPWR	NWMT	0	0
	TPWR	PGE	0	0
	TPWR	PSEI	14,407	12,878
	WALC	AZPS	5,555	7,004
	WALC	CISO	66,114	69,042
	WALC	LADWP	19,365	15,666
	WALC	NEVP	9,651	11,143
	WALC	SRP	2,581	3,104
	WALC	TEPC	29,079	29,534
<i>December</i>	AVA	AVRN	3,993	4,399
	AVA	BPAT	4,326	3,535
	AVA	CISO	0	0
	AVA	IPCO	13,497	17,792
	AVA	NWMT	6,186	8,073
	AVA	PACW	3,757	4,817
	AVA	PGE	0	0
	AVA	PSEI	0	0
	AVA	SCL	0	0
	AVA	TPWR	0	0
	AVRN	AVA	4,667	4,121
	AVRN	BPAT	24,875	25,687
	AVRN	PACW	23,271	29,405
	AVRN	PGE	9,206	8,051
	AVRN	SCL	7,949	6,481
	AZPS	CISO	106,598	117,032
	AZPS	EPE	2,437	0
	AZPS	LADWP	14,166	13,694

<i>December</i>	AZPS	NEVP	0	0
	AZPS	PACE	39,418	29,945
	AZPS	PNM	16,143	21,571
	AZPS	SRP	11,993	16,007
	AZPS	TEPC	483	156
	AZPS	WALC	8,989	7,516
	BANC	BPAT	0	0
	BANC	CISO	1,087	1,274
	BANC	TIDC	24	0
	BPAT	AVA	3,316	2,278
	BPAT	AVRN	8,896	9,829
	BPAT	BANC	0	0
	BPAT	CISO	12,546	32,834
	BPAT	IPCO	2,041	1,043
	BPAT	LADWP	0	0
	BPAT	NEVP	0	0
	BPAT	NWMT	5,424	1,148
	BPAT	PACW	3,683	1,624
	BPAT	PGE	13,334	12,942
	BPAT	PSEI	14,674	13,335
	BPAT	PWRX	4,578	0
	BPAT	SCL	5,419	4,235
	BPAT	TPWR	4,724	3,453
	CISO	AVA	0	0
	CISO	AZPS	20,683	17,696
<i>December</i>	CISO	BANC	186,300	182,457
	CISO	BPAT	13,403	30,535
	CISO	LADWP	27,150	25,908
	CISO	NEVP	9,932	8,078
	CISO	PACW	27,433	52,188
	CISO	PGE	46,138	63,263
	CISO	PSEI	29,697	1,277

<i>December</i>	CISO	PWRX	90,554	104,174
	CISO	SRP	28,468	21,764
	CISO	TEPC	0	0
	CISO	TIDC	5,104	4,691
	CISO	WALC	17,445	13,347
	EPE	AZPS	189	0
	EPE	PNM	26,569	26,028
	EPE	TEPC	34,474	32,520
	IPCO	AVA	9,546	7,974
	IPCO	BPAT	2,528	1,599
	IPCO	NEVP	17,222	19,939
	IPCO	NWMT	448	1,143
	IPCO	PACE	18,139	15,710
	IPCO	PACW	12,663	9,680
	IPCO	PSEI	12,466	10,112
	IPCO	SCL	10,714	8,627
	LADWP	AZPS	1,628	2,196
	LADWP	BPAT	0	0
	LADWP	CISO	76,439	81,275
	LADWP	NEVP	10,032	9,648
	LADWP	PACE	27,791	24,309
	LADWP	TEPC	0	0
	LADWP	WALC	2,059	1,510
	NEVP	AZPS	0	0
	NEVP	BPAT	0	0
<i>December</i>	NEVP	CISO	64,529	67,764
	NEVP	IPCO	33,379	29,478
	NEVP	LADWP	25,736	24,984
	NEVP	PACE	32,604	26,465
	NEVP	WALC	9,693	11,503
	NWMT	AVA	14,831	12,458
	NWMT	BPAT	3,434	1,887

<i>December</i>	NWMT	IPCO	15,277	15,321
	NWMT	PACE	16,083	16,832
	NWMT	PACW	7	0
	NWMT	PGE	12	0
	NWMT	PSEI	101	0
	NWMT	TPWR	0	0
	PACE	AZPS	99,521	125,559
	PACE	IPCO	57,065	55,034
	PACE	LADWP	54,813	57,438
	PACE	NEVP	26,596	35,876
	PACE	NWMT	5,906	5,384
	PACE	PACW	49,506	49,146
	PACE	SRP	0	0
	PACE	TEPC	617	981
	PACW	AVA	2,475	2,792
	PACW	AVRN	16,325	24,799
	PACW	BPAT	2,746	1,989
	PACW	CISO	54,511	89,607
	PACW	IPCO	28,130	31,891
	PACW	NWMT	0	0
	PACW	PGE	40,499	34,859
	PACW	PSEI	26,933	27,911
	PACW	SCL	1,786	1,428
<i>December</i>	PGE	AVA	0	0
	PGE	AVRN	4,972	7,548
	PGE	BPAT	25,193	25,051
	PGE	CISO	32,461	31,939
	PGE	NWMT	208	0
	PGE	PACW	26,684	31,147
	PGE	PSEI	24	43
	PGE	SCL	1,552	1,342
	PGE	TPWR	0	0

<i>December</i>	PNM	AZPS	33,548	36,774
	PNM	EPE	2,714	2,947
	PNM	SRP	239	197
	PNM	TEPC	4,152	4,346
	PSEI	AVA	0	0
	PSEI	BPAT	26,907	28,532
	PSEI	CISO	54,701	1,285
	PSEI	IPCO	3,487	5,254
	PSEI	NWMT	86	0
	PSEI	PACW	9,598	13,286
	PSEI	PGE	524	609
	PSEI	PWRX	15,554	13,208
	PSEI	SCL	49,063	45,337
	PSEI	TPWR	4,619	4,670
	PWRX	BPAT	3,195	0
	PWRX	CISO	0	0
	PWRX	PSEI	12,011	16,125
	SCL	AVA	0	0
	SCL	AVRN	883	1,648
	SCL	BPAT	889	825
	SCL	IPCO	2,707	4,324
	SCL	PACW	147	301
	SCL	PGE	391	541
	SCL	PSEI	1,503	3,467
<i>December</i>	SRP	AZPS	6,842	8,496
	SRP	CISO	129,854	121,310
	SRP	PACE	0	0
	SRP	PNM	748	1,156
	SRP	TEPC	5,392	3,360
	SRP	WALC	5,871	4,896
	TEPC	AZPS	434	0
	TEPC	CISO	367	625

<i>December</i>	TEPC	EPE	3,256	2,979
	TEPC	LADWP	0	0
	TEPC	PACE	0	0
	TEPC	PNM	12,922	14,368
	TEPC	SRP	8,421	8,619
	TEPC	WALC	117,840	111,414
	TIDC	BANC	14	0
	TIDC	CISO	8,050	8,630
	TPWR	AVA	0	0
	TPWR	BPAT	5,140	5,986
	TPWR	NWMT	0	0
	TPWR	PGE	0	0
	TPWR	PSEI	9,786	8,583
	WALC	AZPS	5,229	5,593
	WALC	CISO	62,064	63,996
	WALC	LADWP	12,455	10,155
	WALC	NEVP	7,118	7,772
	WALC	SRP	697	357
	WALC	TEPC	8,697	8,154

APPENDIX 3: Minimum & Maximum Flexible Ramping Requirements

Month	BAA	Direction	Minimum requirement	Maximum requirement
October	AVA	up	1	97
	AVRN	up	0	463
	AZPS	up	0	385
	BANC	up	2	94
	BPAT	up	0	474
	CISO	up	0	2,365
	EPE	up	0	109
	IPCO	up	0	274
	LADWP	up	0	306
	NEVP	up	0	668
	NWMT	up	0	140
	PACE	up	0	769
	PACW	up	10	176
	PGE	up	0	234
	PNM	up	0	265
	PSEI	up	0	276
	PWRX	up	0	265
	SCL	up	0	4437
	SRP	up	0	325
	TEPC	up	0	193
	TIDC	up	0	12
	TPWR	up	0	15
	WALC	up	0	57
	ALL EIM	up	0	3,528
October	AVA	down	0	125
	AVRN	down	0	313
	AZPS	down	0	384
	BANC	down	0	96
	BPAT	down	0	423
	CISO	down	0	1,395
	EPE	down	0	91
	IPCO	down	0	274

October	LADWP	down	0	294
	NEVP	down	0	564
	NWMT	down	0	130
	PACE	down	0	896
	PACW	down	0	198
	PGE	down	13	248
	PNM	down	0	307
	PSEI	down	0	282
	PWRX	down	0	243
	SCL	down	0	34
	SRP	down	0	311
	TEPC	down	0	175
	TIDC	down	0	19
	TPWR	down	0	18
	WALC	down	0	65
	ALL EIM	down	0	2,132
November	AVA	up	0	97
	AVRN	up	1	432
	AZPS	up	0	389
	BANC	up	0	93
	BPAT	up	0	427
	CISO	up	0	2,885
	EPE	up	0	96
	IPCO	up	0	292
	LADWP	up	0	439
	NEVP	up	0	920
	NWMT	up	0	145
	PACE	up	0	690
	PACW	up	0	185
	PGE	up	3	229
	PNM	up	0	416
	PSEI	up	0	276
	PWRX	up	0	342
	SCL	up	0	32
	SRP	up	0	358
	TEPC	up	0	193

November	TIDC	up	0	13
	TPWR	up	0	17
	WALC	up	0	54
	ALL WEIM	up	0	4,786
	AVA	down	0	150
	AVRN	down	0	31
	AZPS	down	0	384
	BANC	down	0	153
	BPAT	down	0	436
	CISO	down	0	1,466
	EPE	down	0	90
	IPCO	down	0	268
	LADWP	down	0	269
	NEVP	down	0	610
	NWMT	down	0	152
	PACE	down	0	932
	PACW	down	0	210
	PGE	down	0	264
	PNM	down	0	366
	PSEI	down	0	246
	PWRX	down	0	298
	SCL	down	0	36
	SRP	down	0	341
	TEPC	down	0	212
	TIDC	down	0	20
	TPWR	down	0	20
	WALC	down	0	65
	ALL EIM	down	0	2,343
December	AVA	up	0	97
	AVRN	up	2	403
	AZPS	up	13	384
	BANC	up	7	93
	BPAT	up	0	429
	CISO	up	151	2,922
	EPE	up	4	96

<i>December</i>	<i>IPCO</i>	up	0	252
	<i>LADWP</i>	up	0	439
	<i>NEVP</i>	up	0	920
	<i>NWMT</i>	up	0	145
	<i>PACE</i>	up	0	676
	<i>PACW</i>	up	1	185
	<i>PGE</i>	up	0	228
	<i>PNM</i>	up	0	416
	<i>PSEI</i>	up	21	246
	<i>PWRX</i>	up	5	307
	<i>SCL</i>	up	0	28
	<i>SRP</i>	up	0	309
	<i>TEPC</i>	up	0	178
	<i>TIDC</i>	up	1	13
	<i>TPWR</i>	up	0	15
	<i>WALC</i>	up	3	58
	ALL WEIM	up	0	4,328
	<i>AVA</i>	down	0	190
	<i>AVRN</i>	down	0	351
	<i>AZPS</i>	down	0	311
	<i>BANC</i>	down	6	154
	<i>BPAT</i>	down	0	428
	<i>CISO</i>	down	38	1,466
	<i>EPE</i>	down	4	68
	<i>IPCO</i>	down	0	262
	<i>LADWP</i>	down	0	284
	<i>NEVP</i>	down	0	633
	<i>NWMT</i>	down	0	160
<i>December</i>	<i>PACE</i>	down	0	862
	<i>PACW</i>	down	0	215
	<i>PGE</i>	down	0	252
	<i>PNM</i>	down	0	366
	<i>PSEI</i>	down	0	243
	<i>PWRX</i>	down	22	285
	<i>SCL</i>	down	0	31
	<i>SRP</i>	down	7	255

	<i>TEPC</i>	down	10	166
	<i>TIDC</i>	down	0	16
	<i>TPWR</i>	down	0	18
	<i>WALC</i>	down	1	65
	ALL WEIM	down	0	4,225