California ISO | WESTERN ENERGY IMBALANCE MARKET (WEIM)

Q4 2024 Report on Market Issues and Performance

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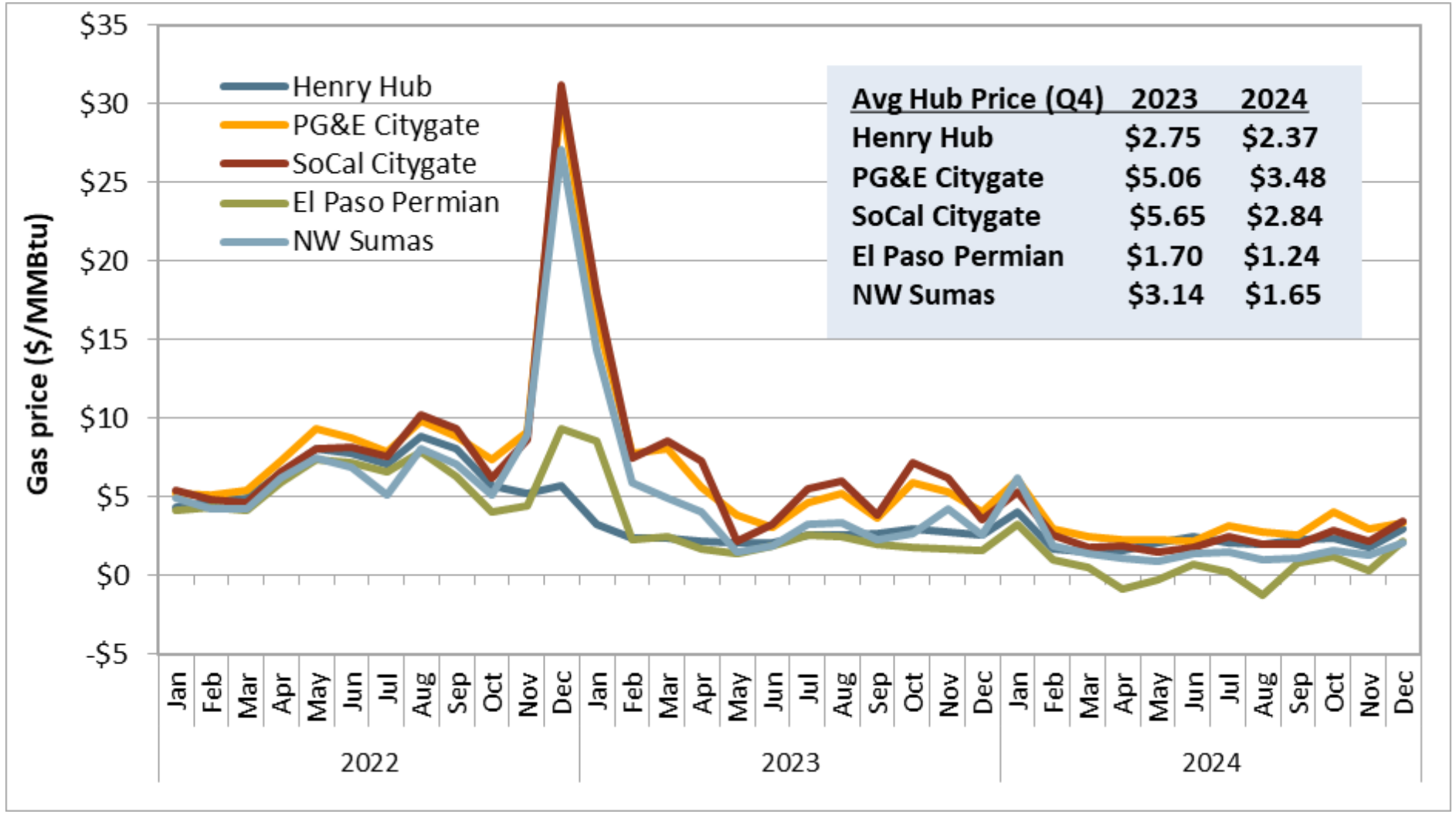
https://www.caiso.com/documents/2024-fourth-quarter-report-on-market-issues-and-performance-mar-24-2025.pdf

Gas prices down significantly from Q4 2023

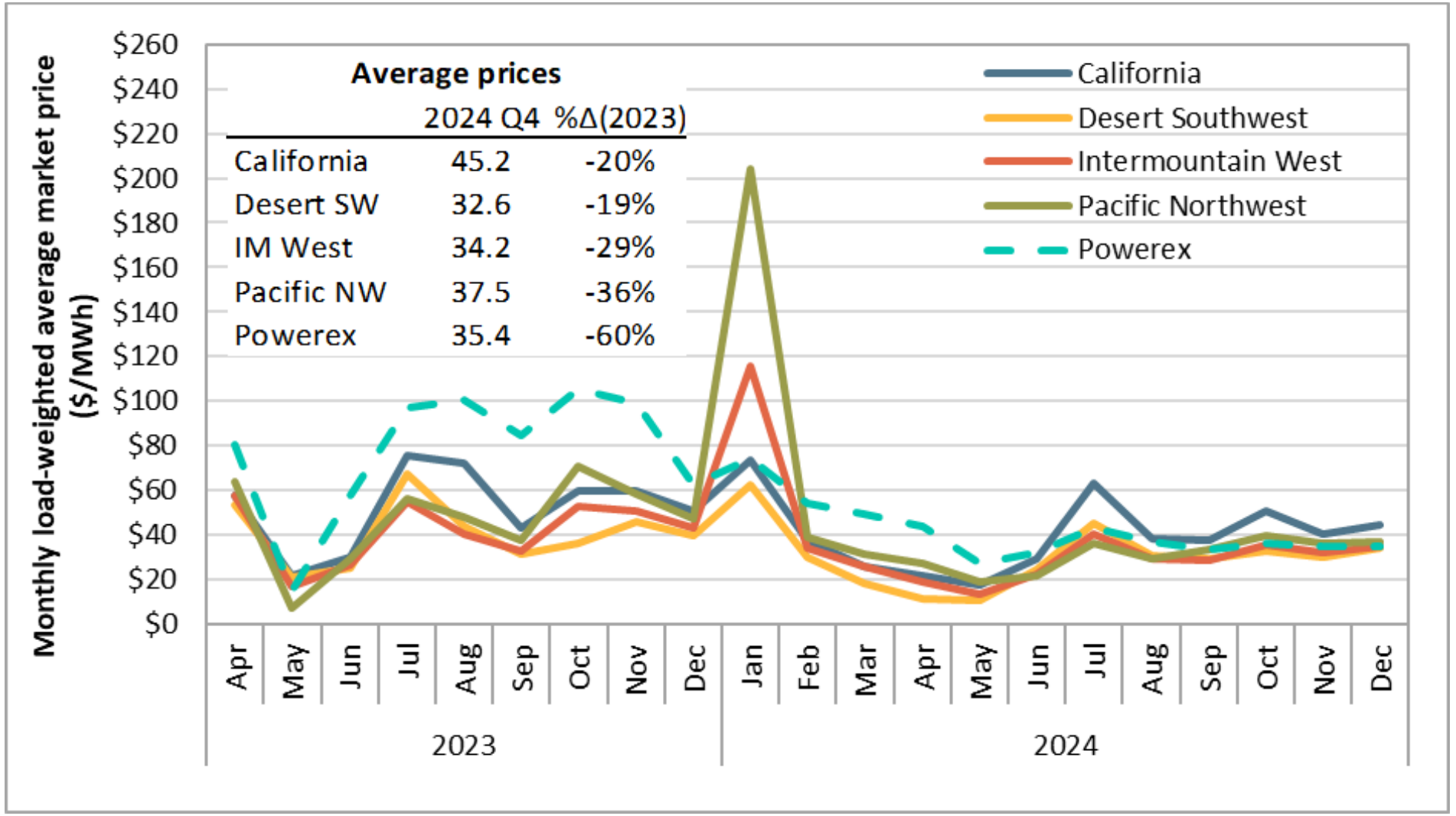
Average monthly natural gas prices by hub



Avg Hub Price (Q4)	2023	2024
Henry Hub	$2.75	$2.37
PG&E Citygate	$5.06	$3.48
SoCal Citygate	$5.65	$2.84
El Paso Permian	$1.70	$1.24
NW Sumas	$3.14	$1.65

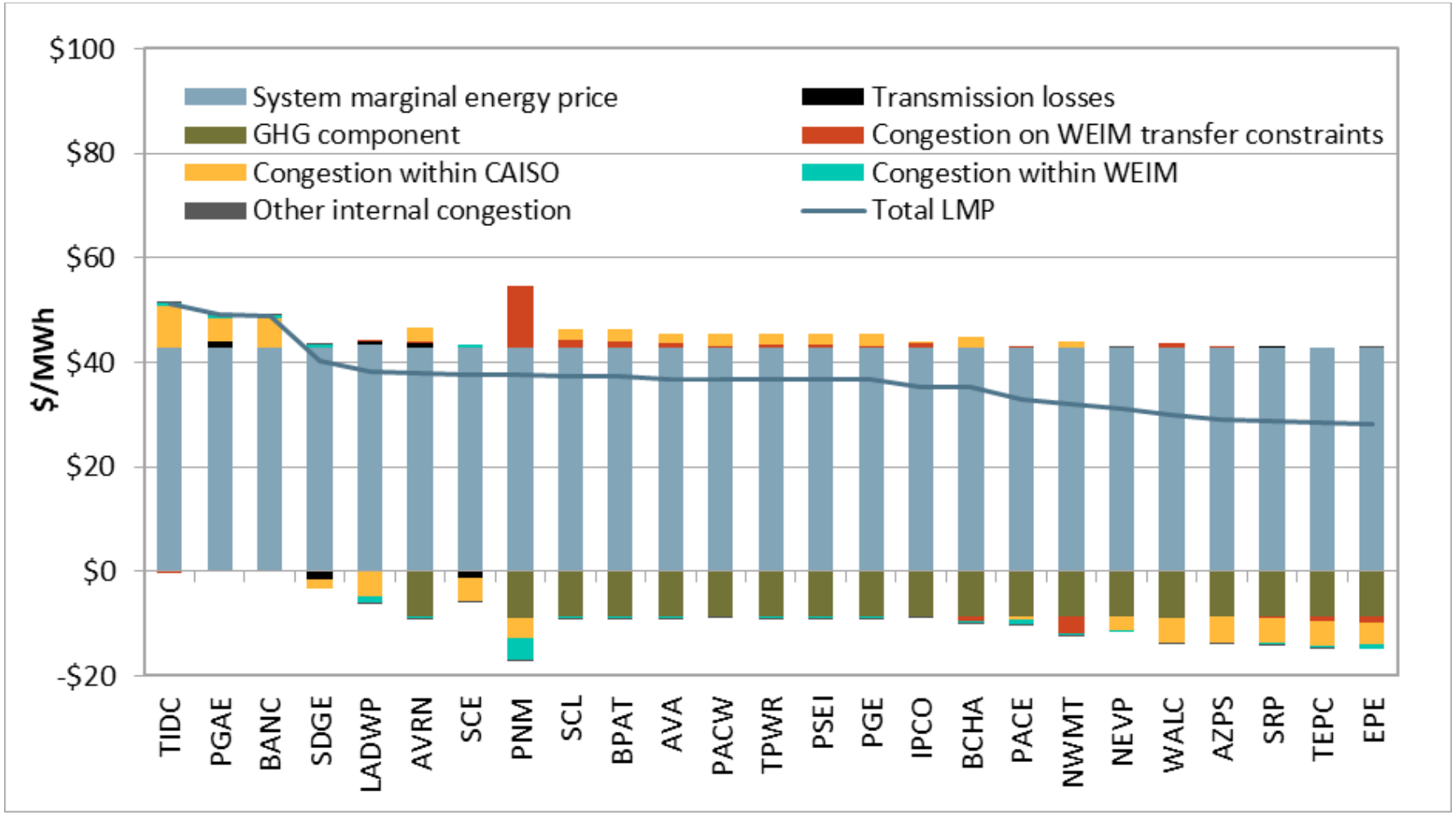
Electricity prices in West decreased with the lower gas prices

Weighted average monthly 15-minute market prices by region



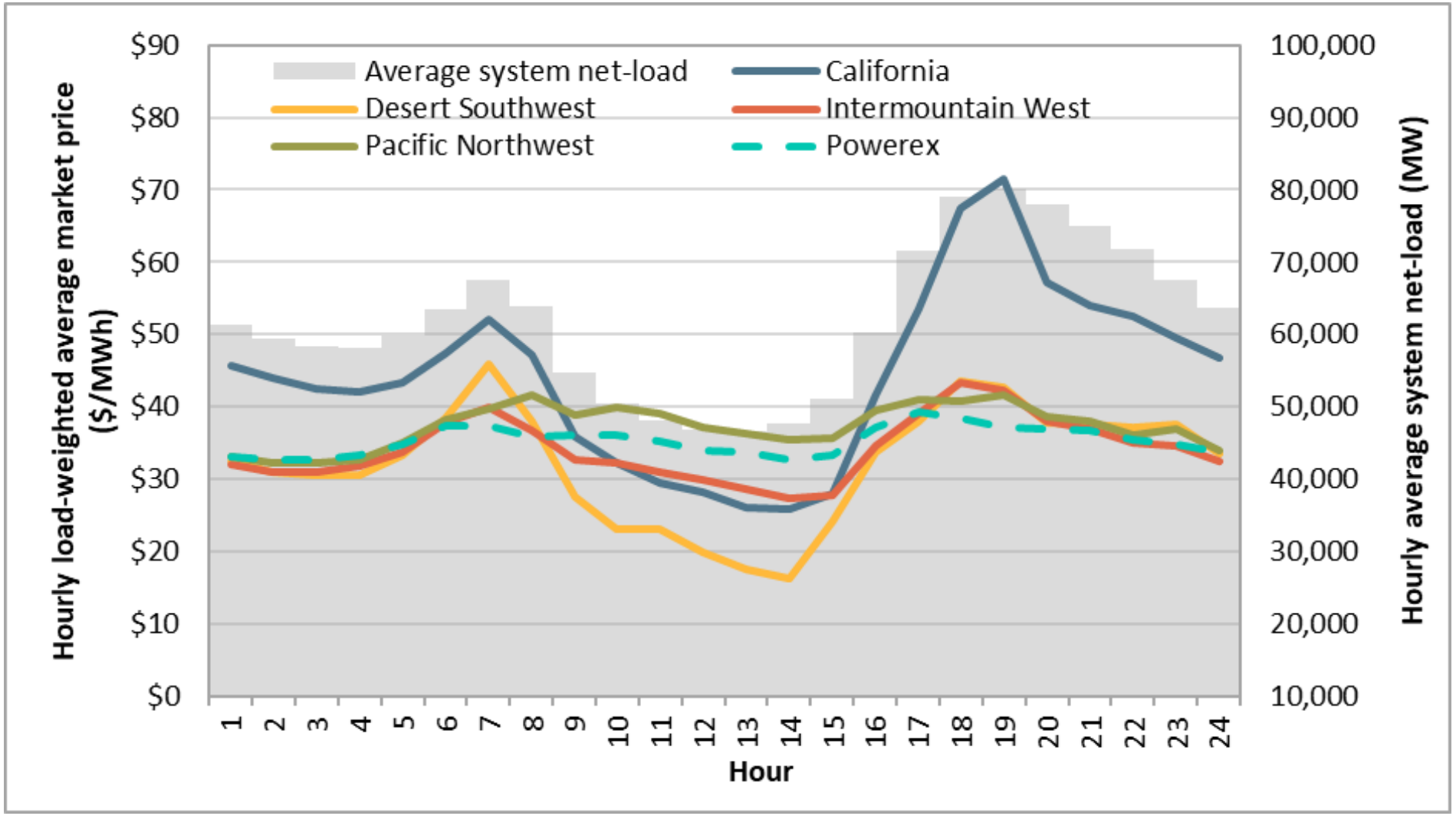
Average price separation driven largely by greenhouse gas costs in California and congestion on constraints in CAISO

Average 15-minute market prices by component (October - December 2024)



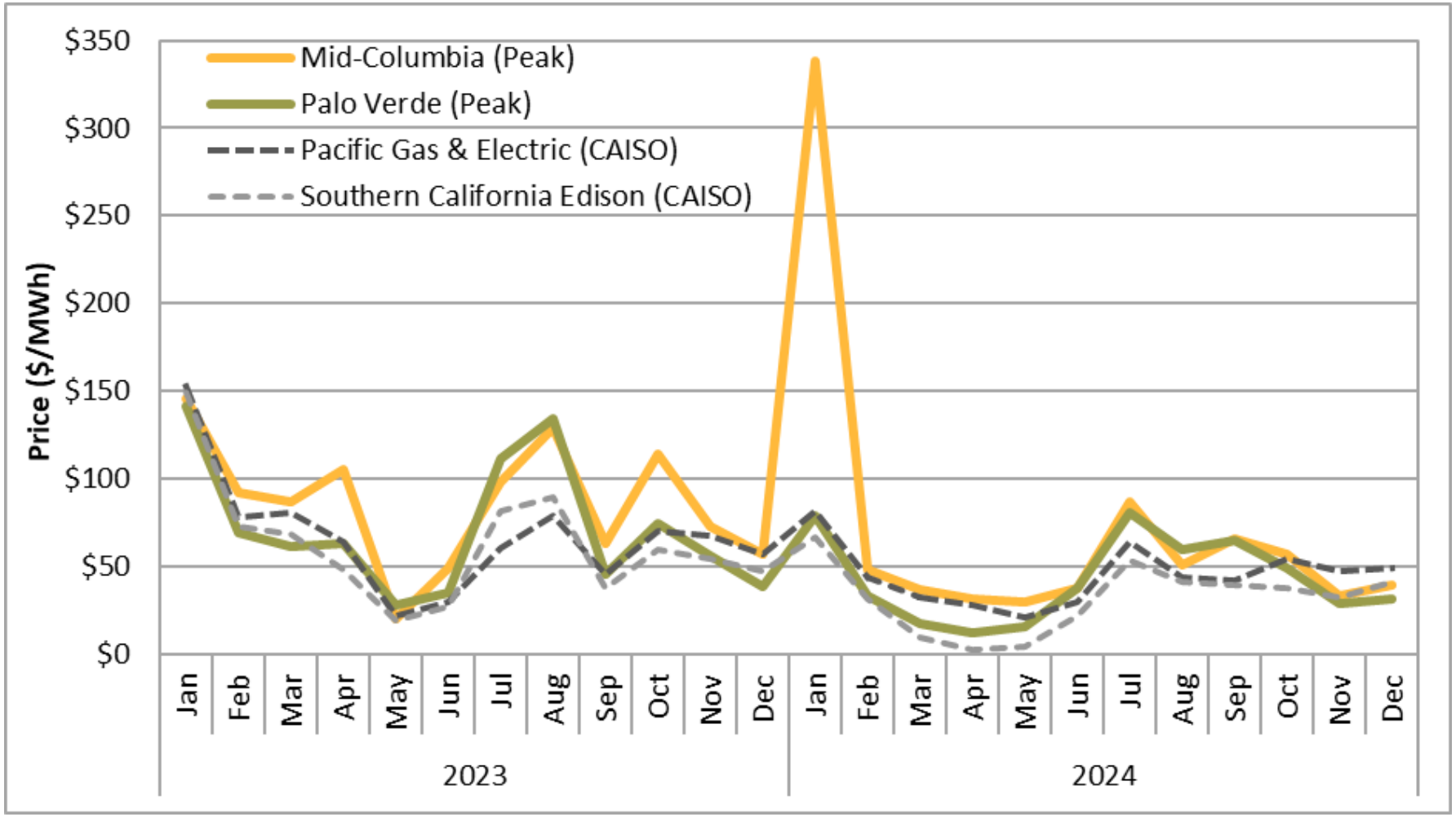
Prices in Northwest higher than rest of system during solar hours

Weighted average hourly 15-minute market prices by region (October – December 2024)



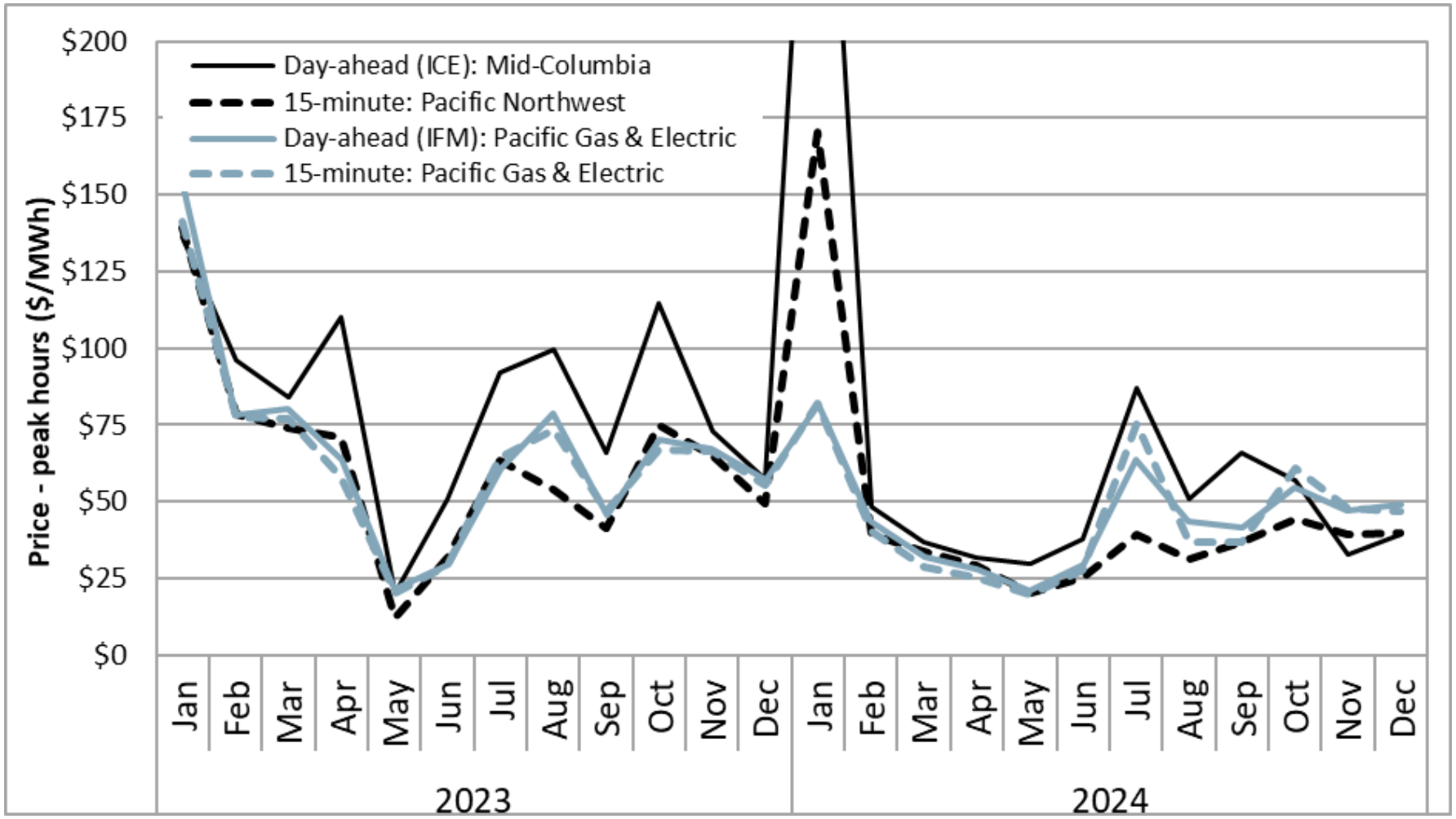
Mid-C and Palo Verde bilateral prices similar to ISO PG&E prices in October, dropping beneath PG&E prices in November and December

Monthly average day-ahead ISO and bilateral prices (peak hours)



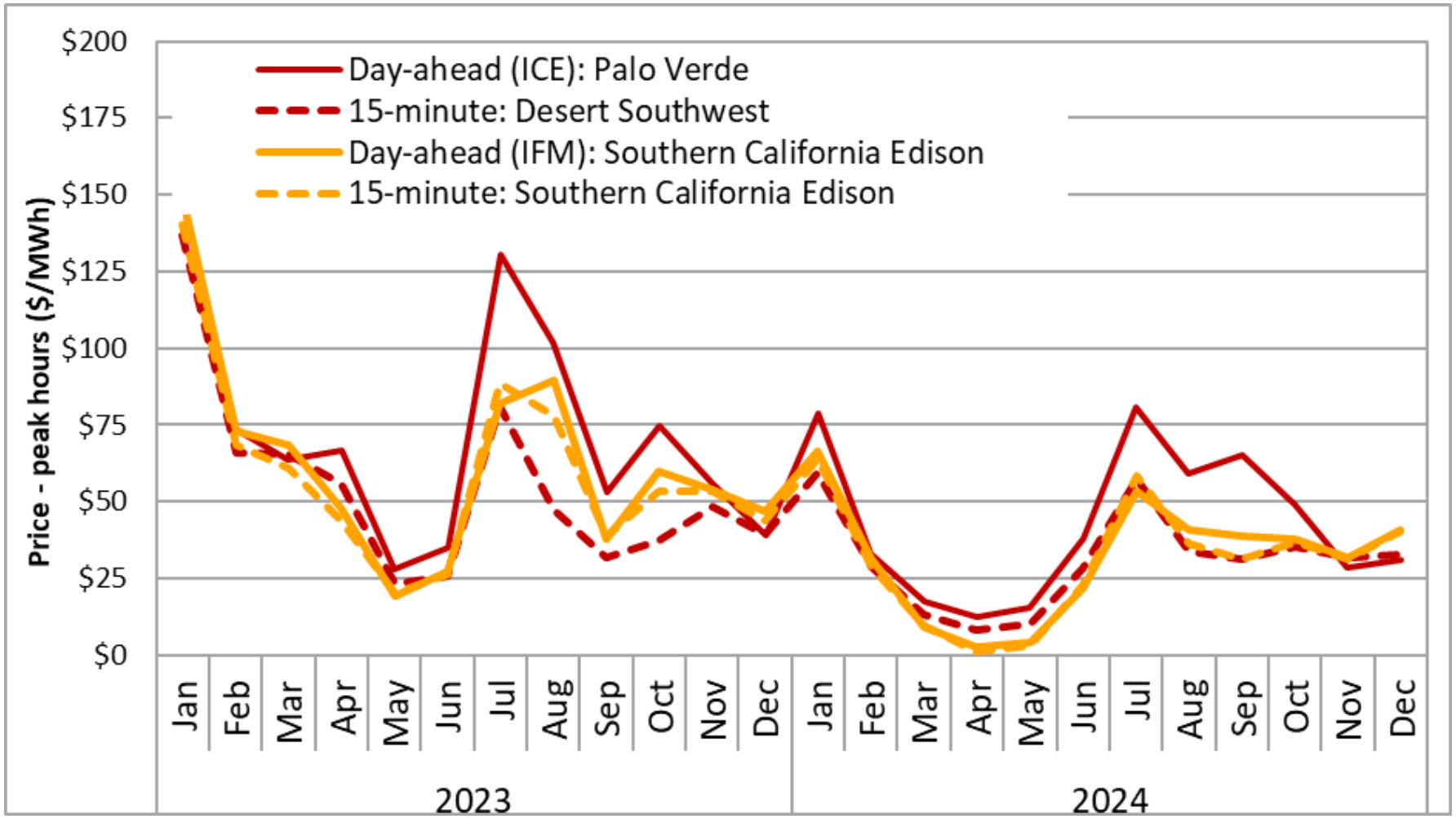
Bilateral day-ahead prices at Mid-C drop and converge to WEIM 15-minute market prices in Pacific Northwest in November and December

Mid-C bilateral day-ahead ICE vs. Pacific Northwest 15-minute market prices (peak hours)



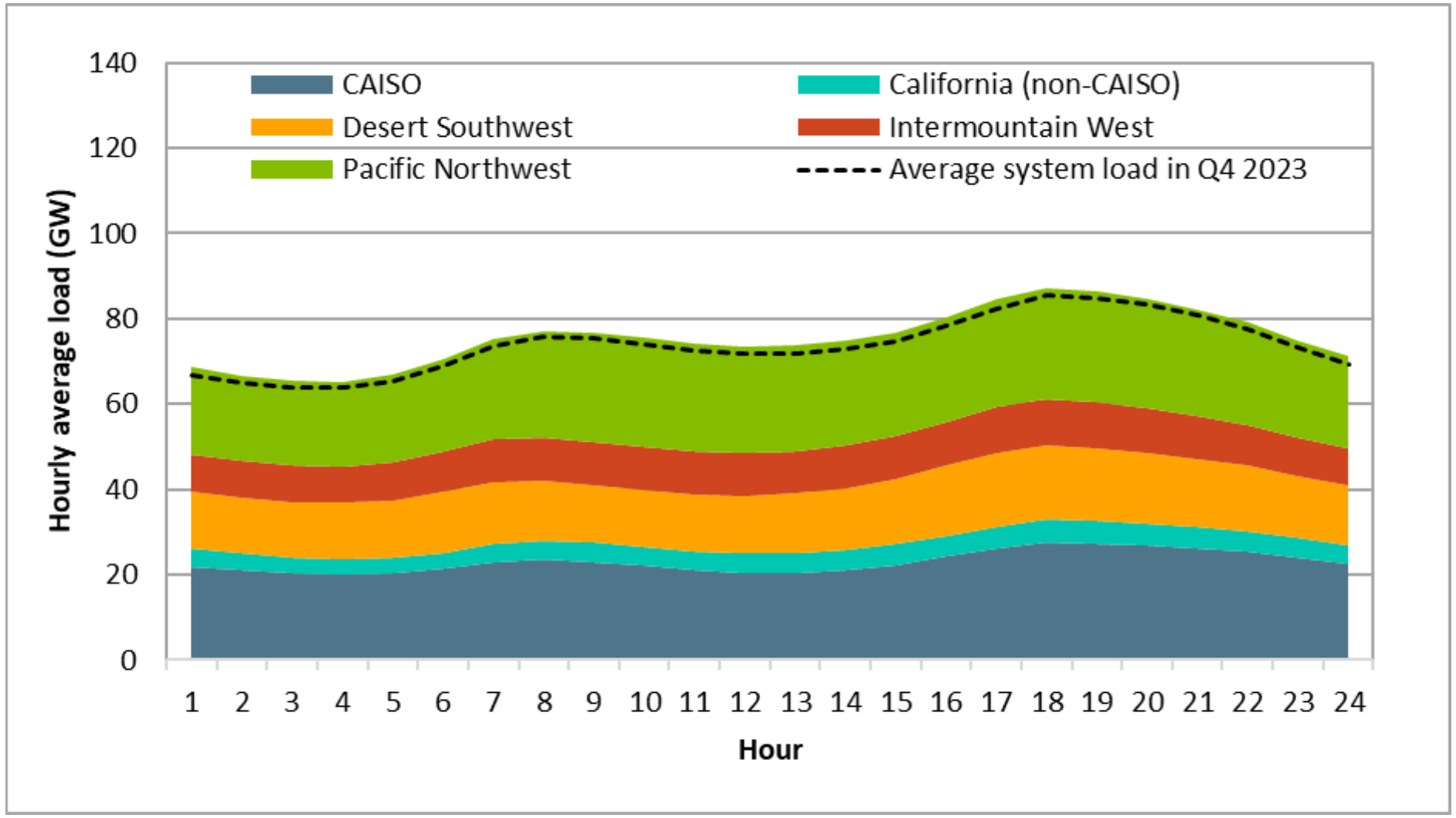
Bilateral day-ahead prices at Palo Verde converge to WEIM Desert Southwest prices over 4th quarter

Palo Verde bilateral day-ahead ICE vs. Desert Southwest 15-minute market prices (peak hours)



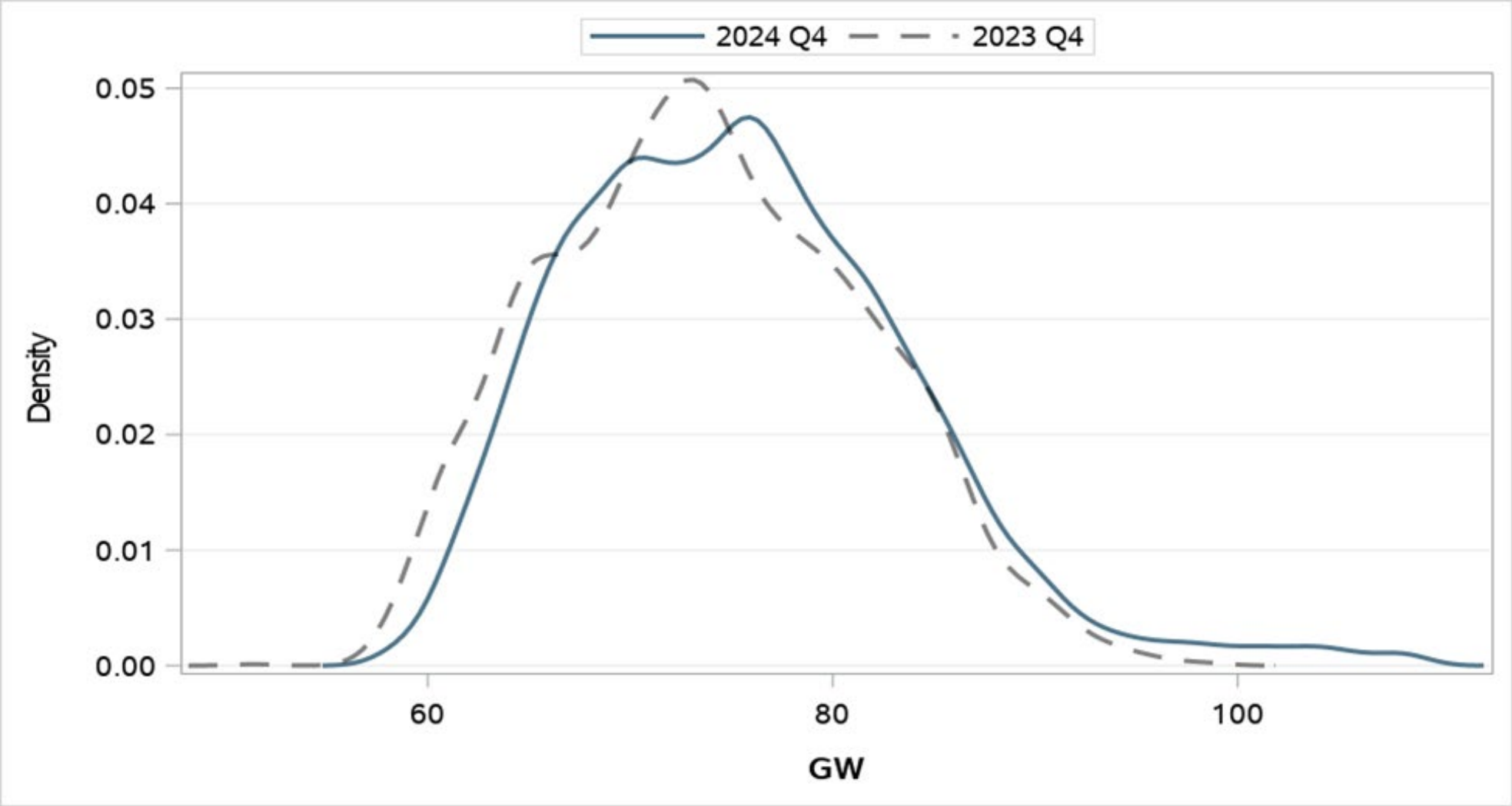
WEIM system load up 2% compared to Q4 2023

Hourly average 5-minute market load by region (October-December 2024)



More high load and less low load intervals in Q4 2024 than Q4 2023

Quarterly 5-minute market system load distribution



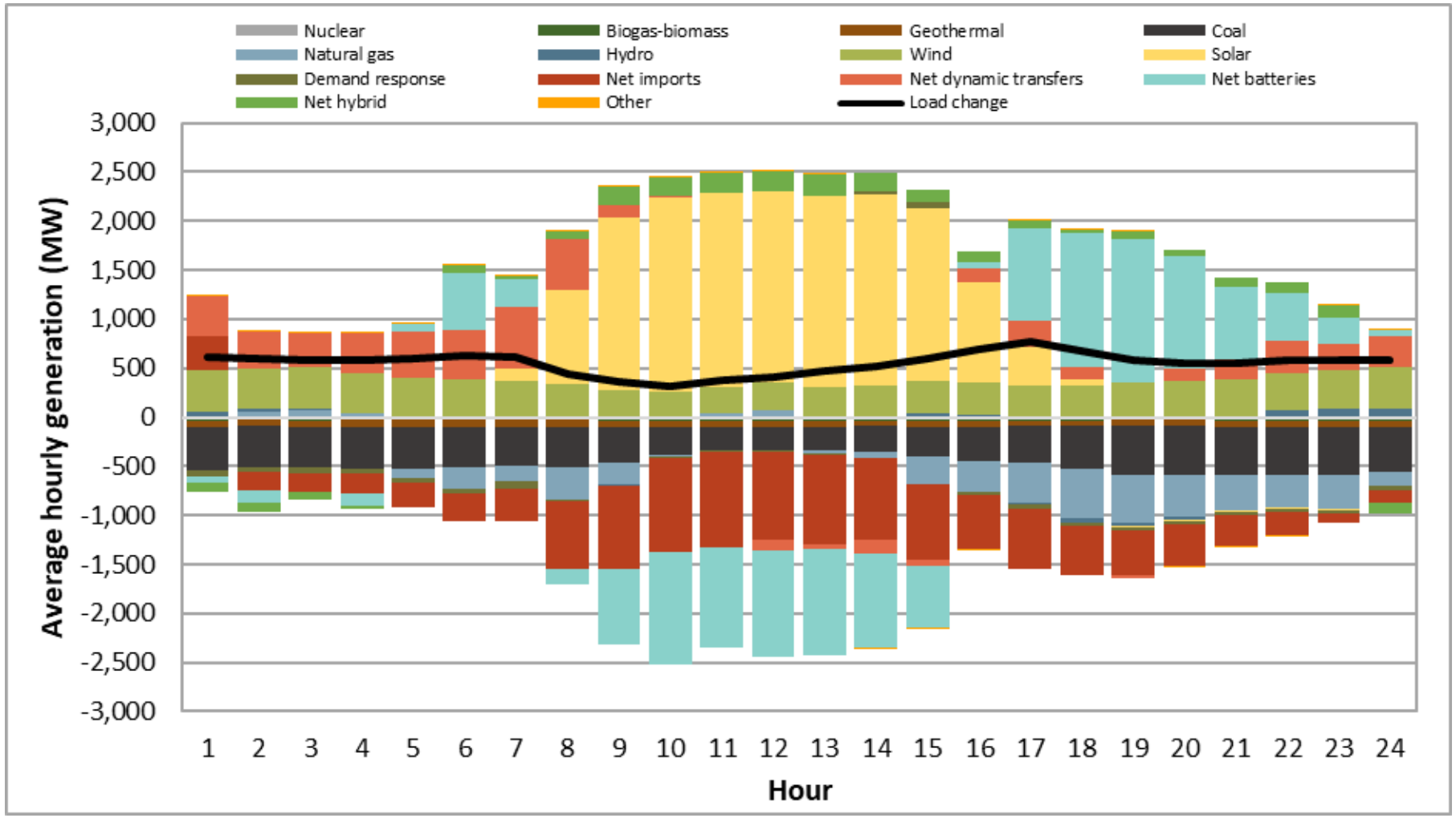
Peak loads in October for California and Desert Southwest areas; December for Pacific Northwest and Intermountain West areas

Peak WEIM 5-minute market load (October-December 2024)

	Peak load (October - December, 2024)		Load during WEIM system peak (2-Oct-24)	
Region/ balancing area	Date	Load (MW)	Load (MW)	Percent
WEIM system	**2-Oct-24**	**110,510**	**110,510**	
California	**2-Oct-24**	**49,373**	**49,373**	**45%**
California ISO	2-Oct-24	40,778	40,752	37%
BANC	2-Oct-24	3,659	3,619	3%
LADWP	2-Oct-24	4,553	4,384	4%
Turlock Irrig. District	3-Oct-24	633	618	0.6%
Desert Southwest	**1-Oct-24**	**28,822**	**26,965**	**24%**
Arizona Public Service	1-Oct-24	7,265	6,703	6%
El Paso Electric	3-Oct-24	1,634	1,445	1%
NV Energy	1-Oct-24	7,171	7,076	6%
PSC New Mexico	3-Oct-24	2,054	1,956	2%
Salt River Project	1-Oct-24	7,267	6,314	6%
Tucson Electric	1-Oct-24	2,468	2,307	2%
WAPA - Desert SW	1-Oct-24	1,306	1,164	1%
Intermountain West	**9-Dec-24**	**12,732**	**11,248**	**10%**
Avista Utilities	5-Dec-24	1,707	1,146	1%
Idaho Power	11-Dec-24	2,613	2,197	2%
NorthWestern Energy	16-Dec-24	1,687	1,200	1%
PacifiCorp East	9-Dec-24	6,914	6,706	6%
Pacific Northwest	**10-Dec-24**	**32,505**	**22,923**	**21%**
BPA	4-Dec-24	9,414	6,218	6%
PacifiCorp West	10-Dec-24	3,602	2,453	2%
Portland General Electric	2-Dec-24	3,632	2,590	2%
Powerex	16-Dec-24	10,478	7,446	7%
Puget Sound Energy	4-Dec-24	4,318	2,714	2%
Seattle City Light	4-Dec-24	1,567	1,028	1%
Tacoma Power	5-Dec-24	796	474	0.4%

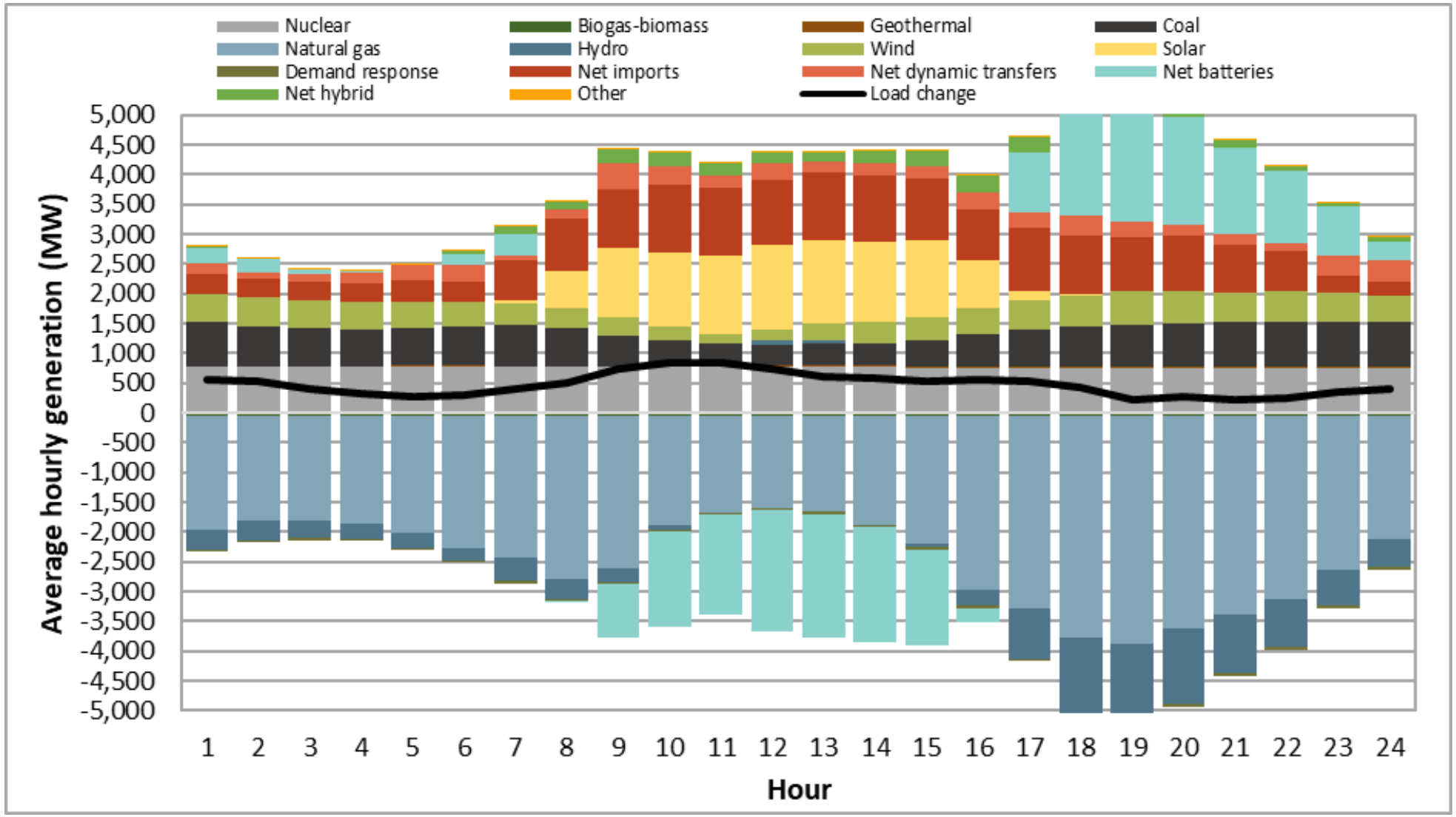
Change in average hourly generation by fuel type in the Desert Southwest Region

Q4 2024 vs. Q4 2023



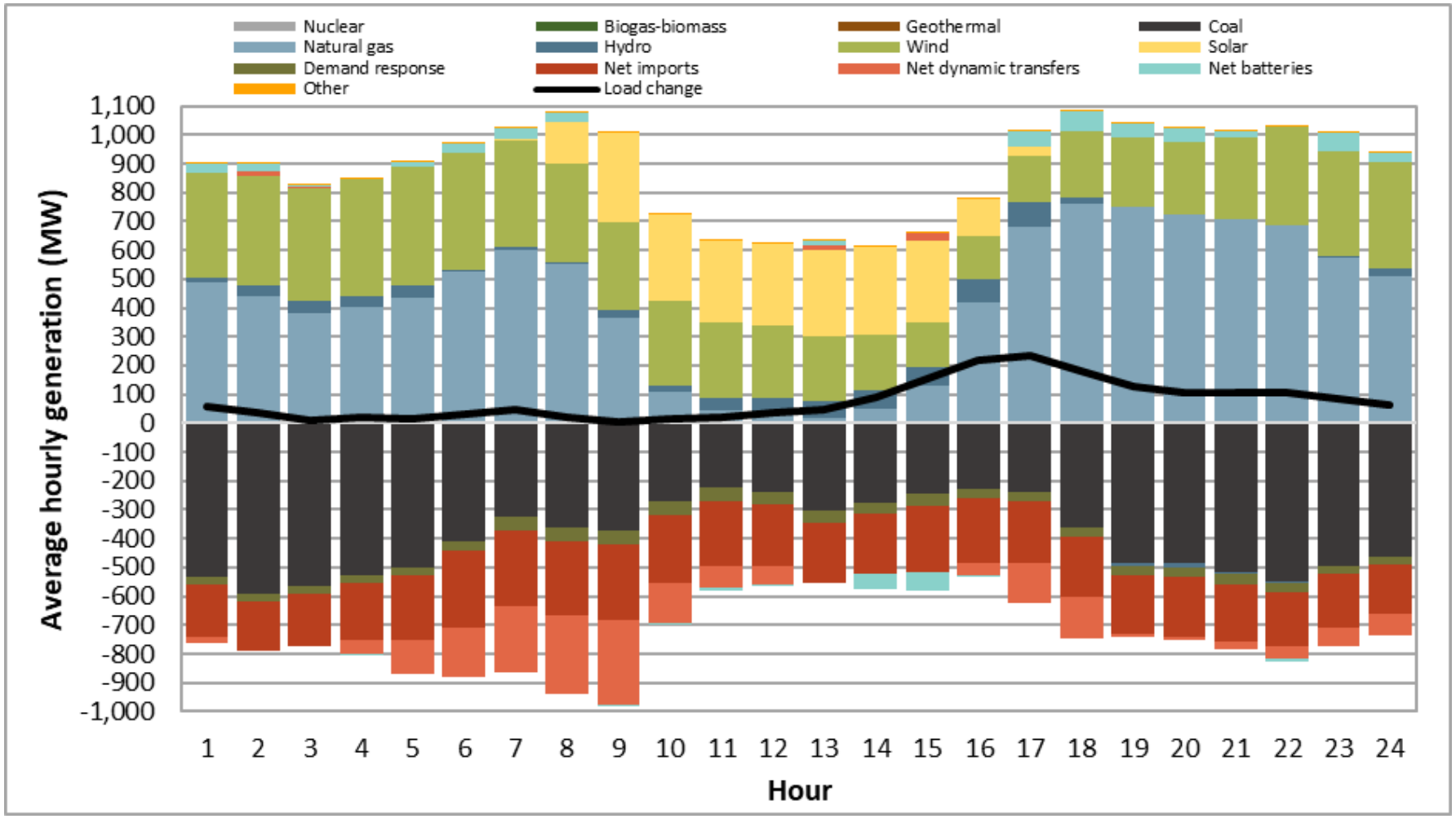
Change in average hourly generation by fuel type in the California Region

Q4 2024 vs. Q4 2023



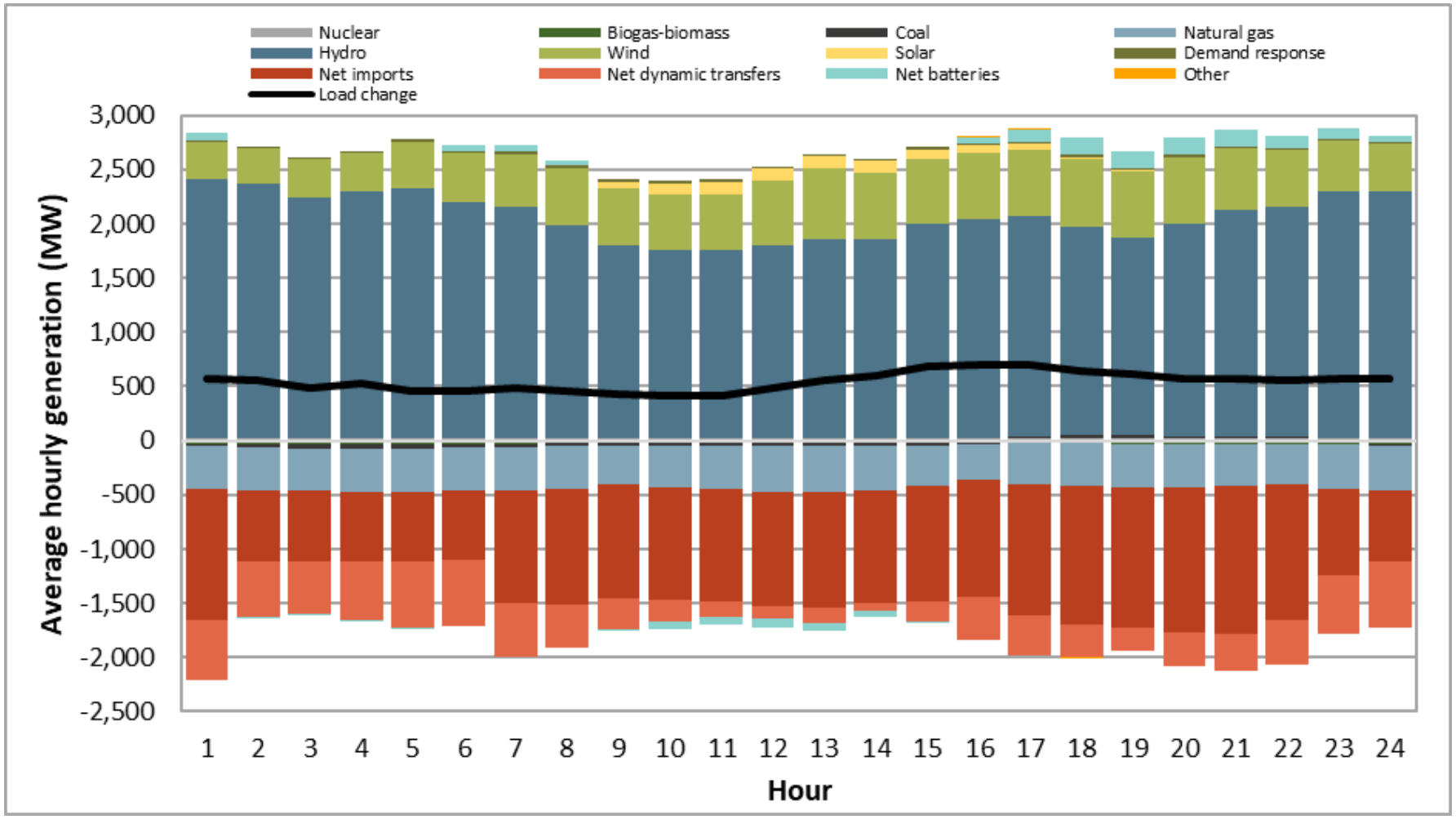
Change in average hourly generation by fuel type in the Intermountain West Region

Q4 2024 vs. Q4 2023

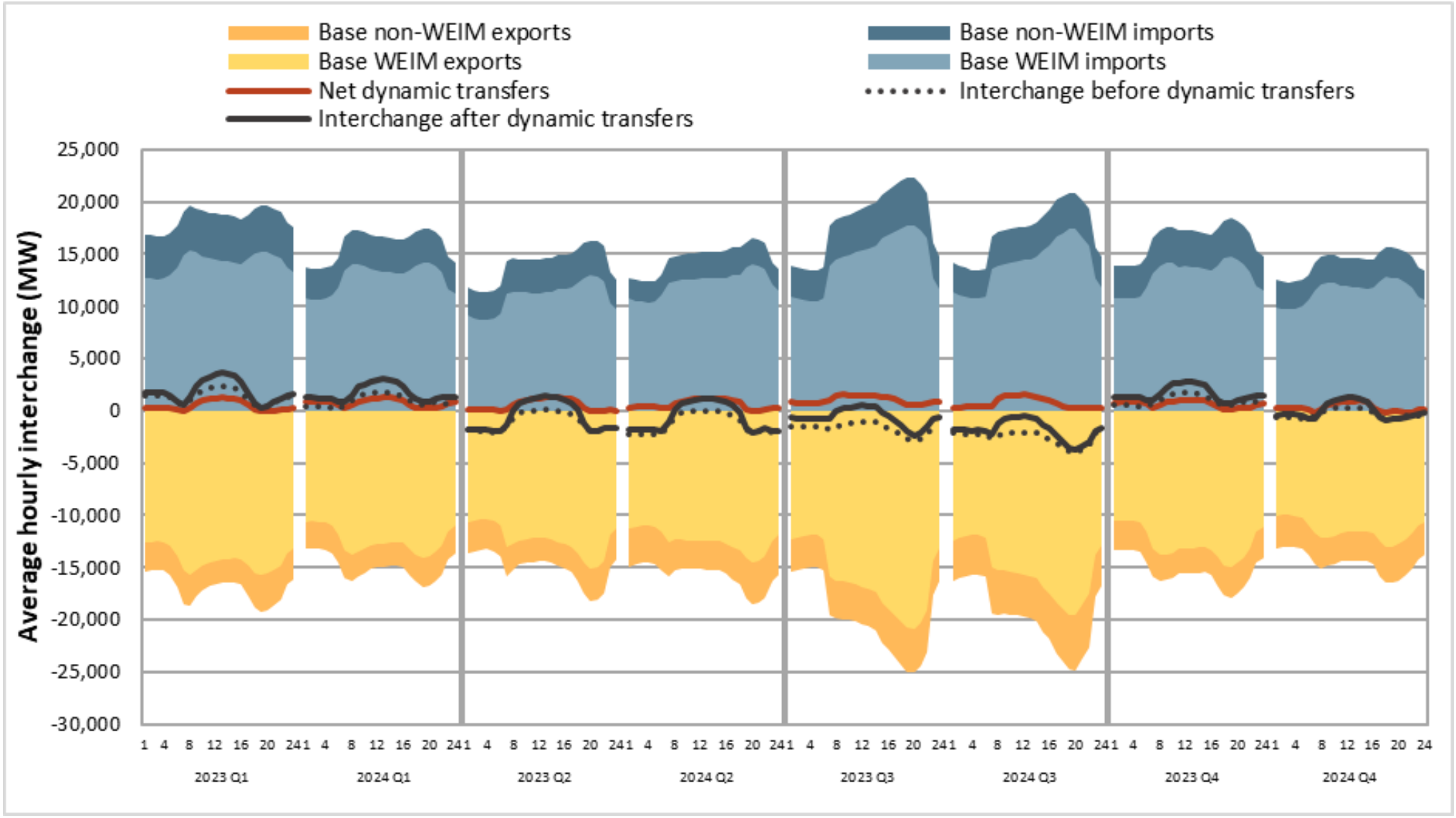


Change in average hourly generation by fuel type in the Pacific Northwest region

Q4 2024 vs. Q4 2023

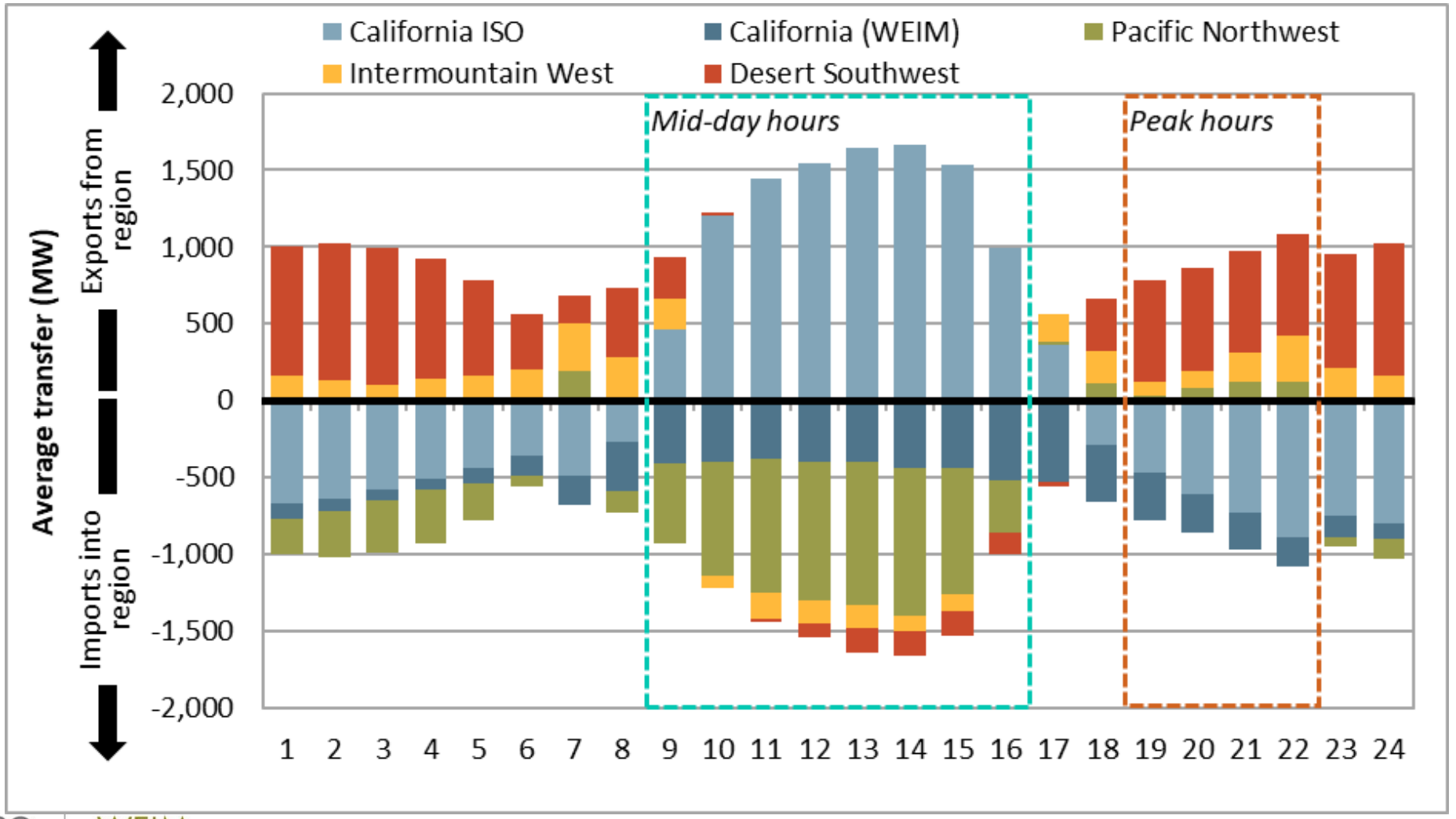


Pacific Northwest – Average hourly net interchange by quarter

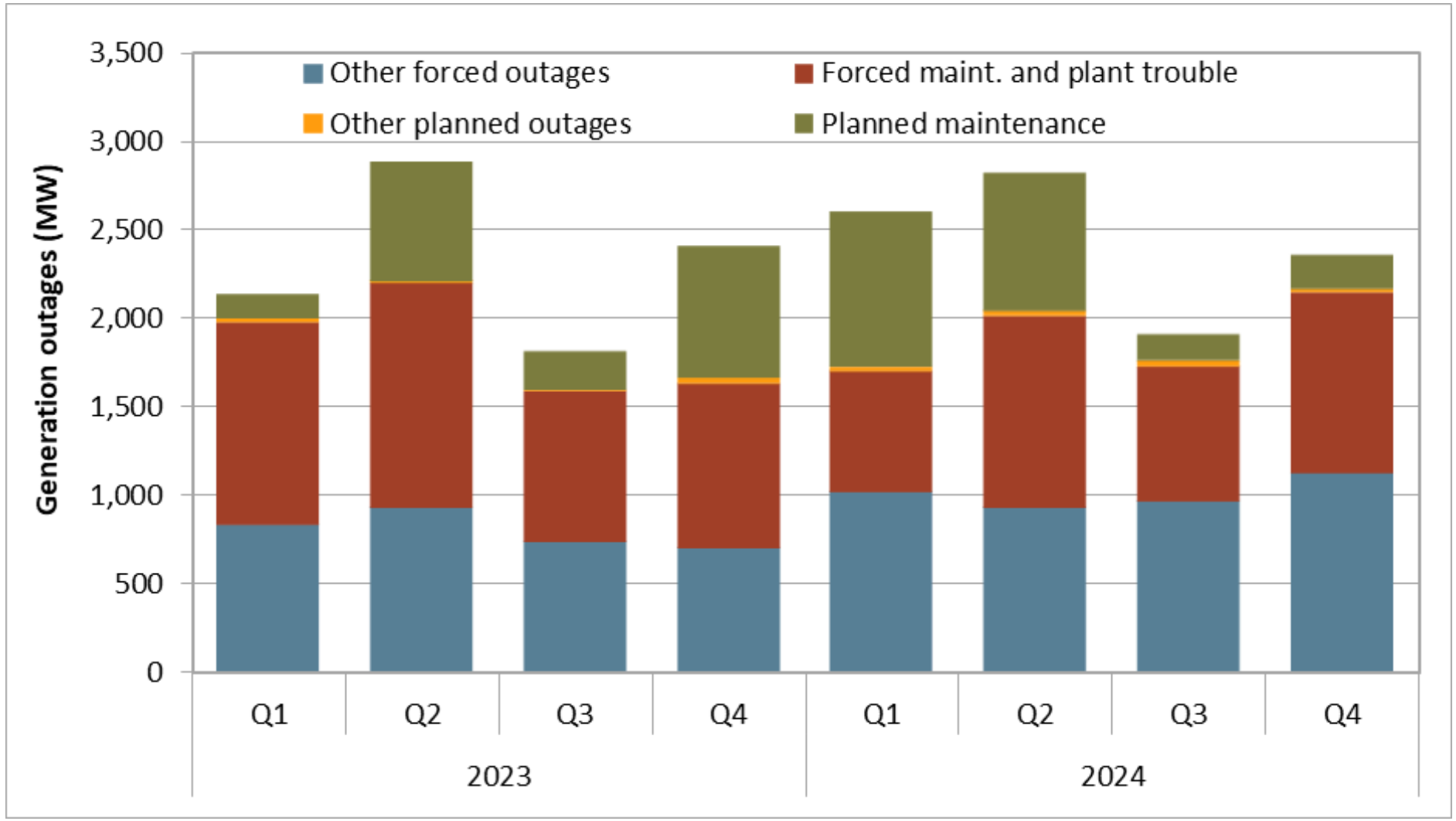


WEIM transfers from CAISO in mid-day hours and from Desert Southwest and Intermountain West in peak evening hours

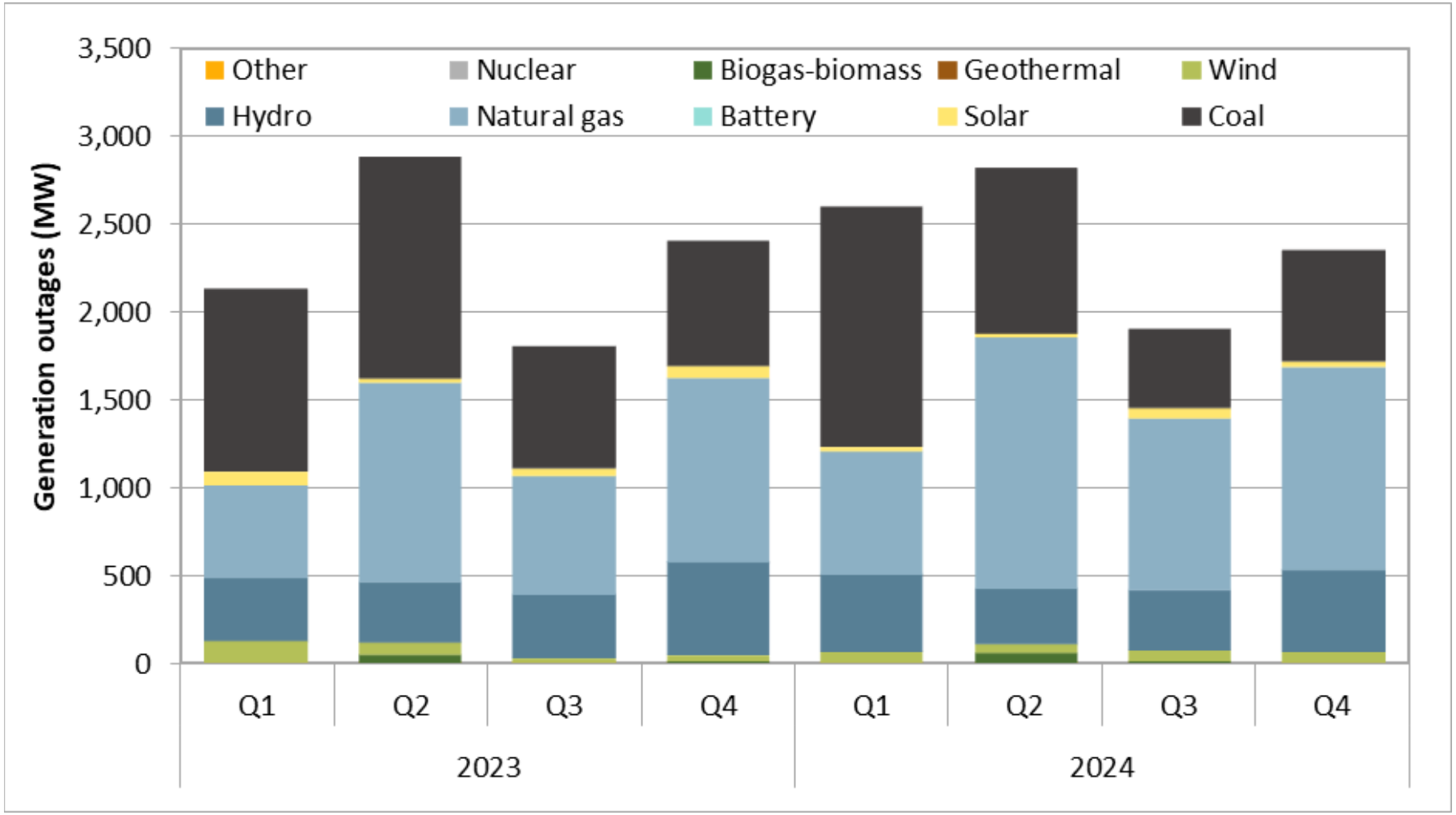
Average dynamic inter-regional WEIM transfers by hour (5-minute market, October-December 2024)



Intermountain West WEIM region quarterly average of maximum daily generation outages by type – peak hours



Intermountain West WEIM region quarterly average of maximum daily generation outages by fuel type – peak hours

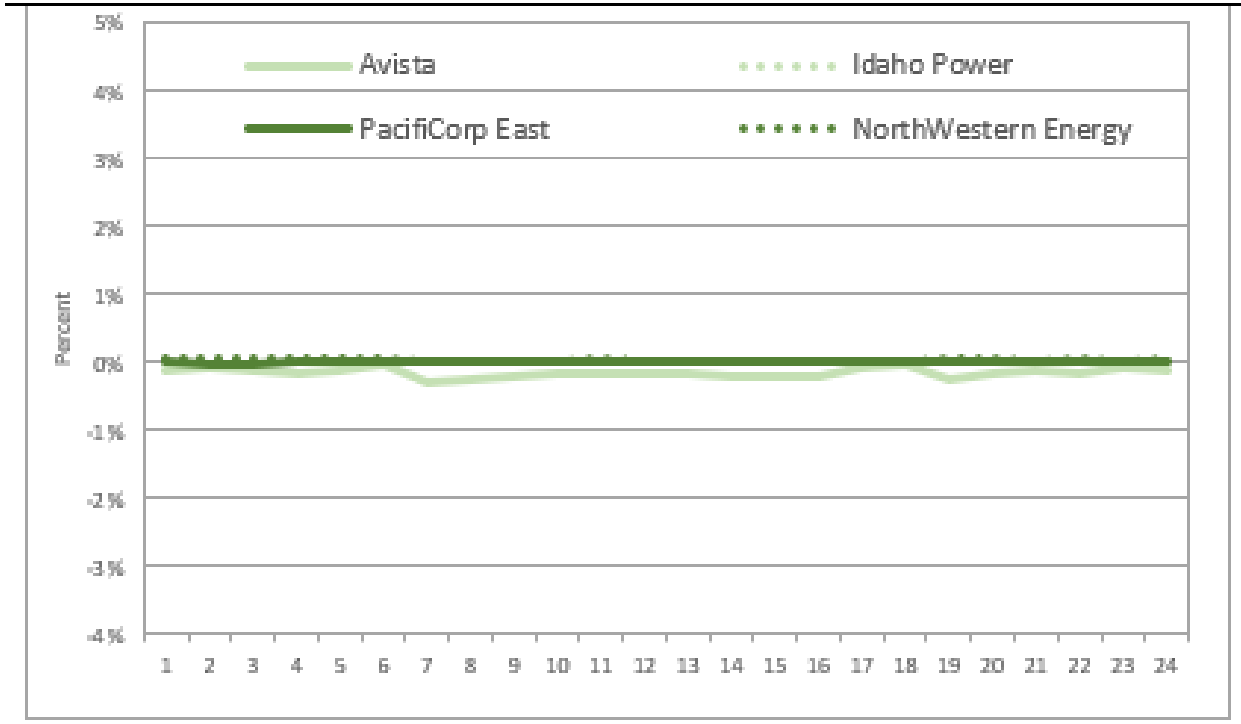


Frequency of available balancing capacity offered (Q4 2024)

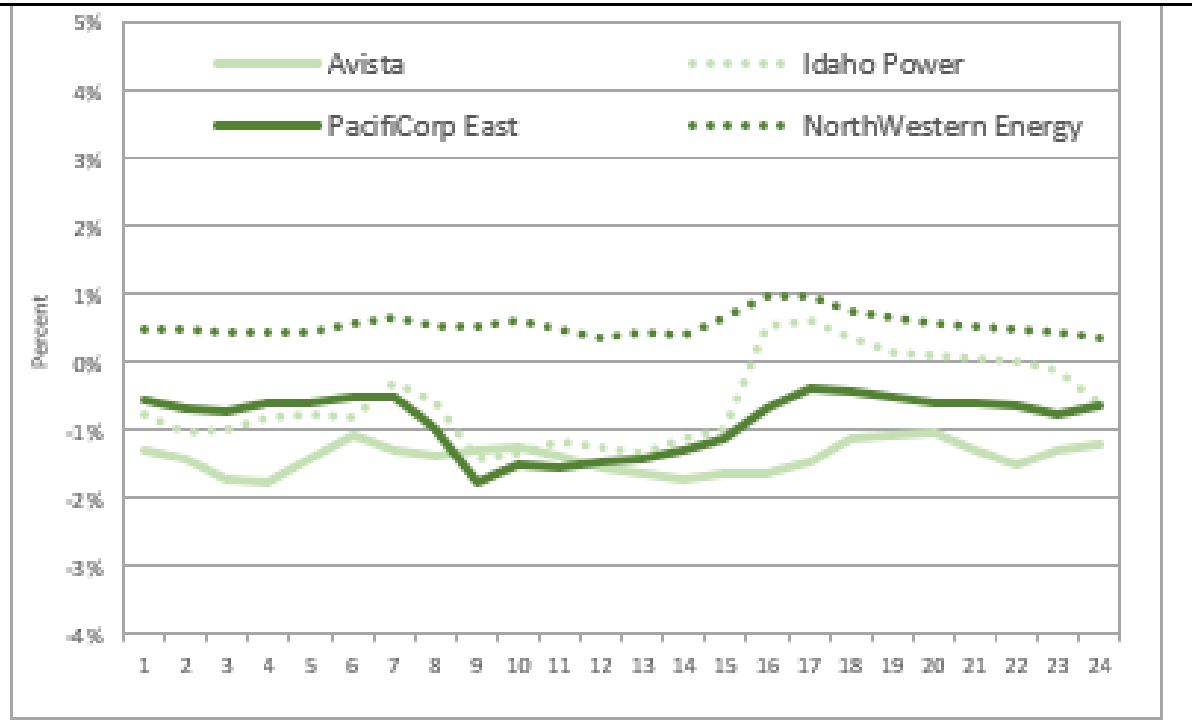
	ABC Up Offered		ABC Down Offered	
	Percent of Hours	Average MW	Percent of Hours	Average MW
BANC	100%	82	100.0%	92
Bonneville Power Admin.	100%	317	100.0%	600
Turlock Irrigation District	100%	15	100.0%	333
Avista Utilities	100%	10	100.0%	5
Powerex	100%	1,139	100.0%	10
Tucson Electric	100%	30	100.0%	30
Salt River Project	100%	99	96.0%	15
WAPA - Desert Southwest	96%	15	98.0%	5
NV Energy	100%	70	96.0%	50
Portland General Electric	99%	30	93.0%	3
Tacoma Power	87%	2	100.0%	61
NorthWestern Energy	98%	5	97.0%	70
Arizona Public Service	99%	61	28.0%	33
LADWP	83%	61	95.0%	176
PacifiCorp East	35%	76	5.0%	105
Seattle City Light	0%	N/A	0.0%	N/A
PacifiCorp West	1%	112	1.0%	50
PSC New Mexico	0%	N/A	0.0%	N/A
El Paso Electric	0%	N/A	0.0%	N/A
Puget Sound Energy	0%	N/A	0.0%	N/A
Avangrid	100%	38	0.0%	N/A
Idaho Power	0%	N/A	0.0%	N/A

Intermountain West: Average hourly load adjustments as a percent of average load by balancing area (Q4 2024)

15-minute market

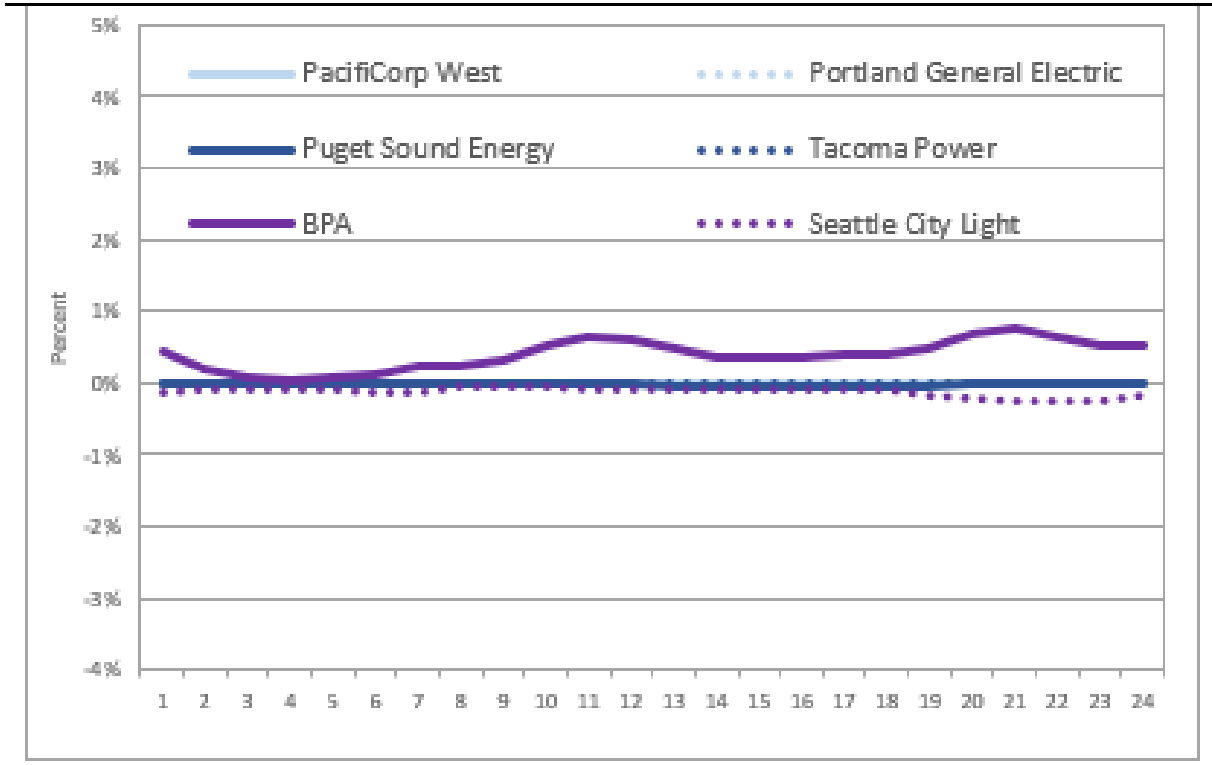


5-minute market

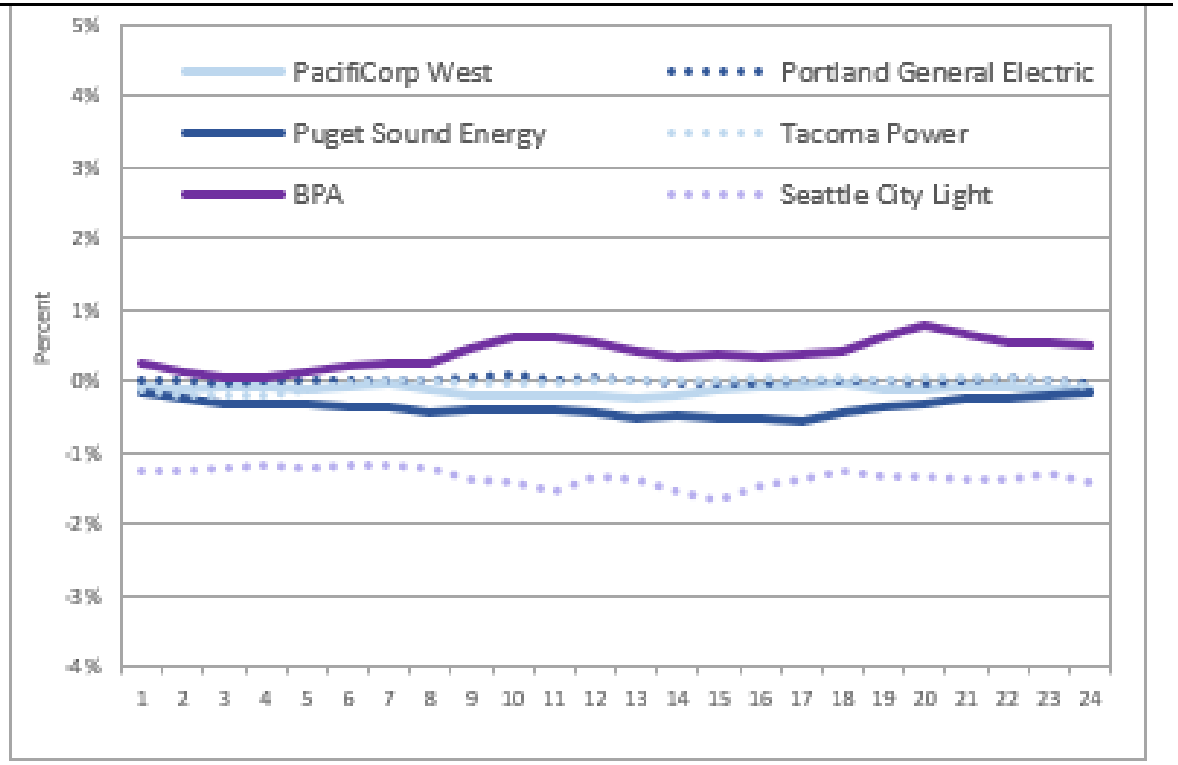


Pacific Northwest: Average hourly load adjustments as a percent of average load by balancing area (Q4 2024)

15-minute market

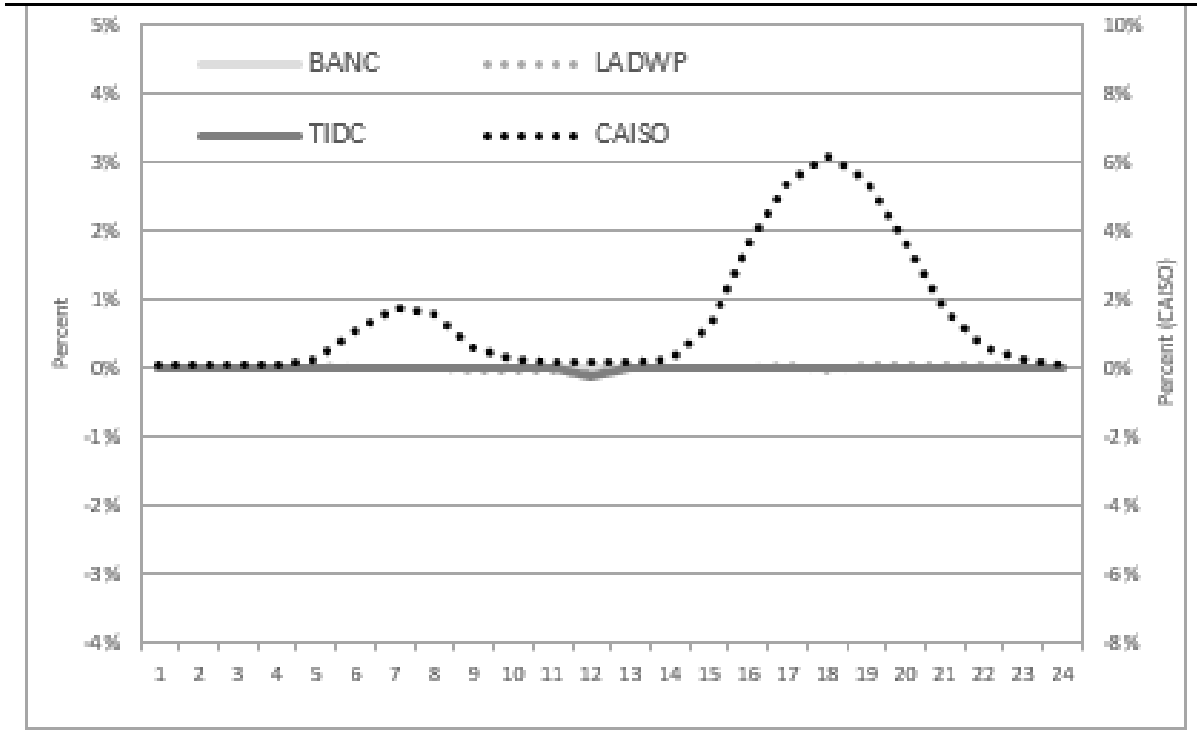


5-minute market

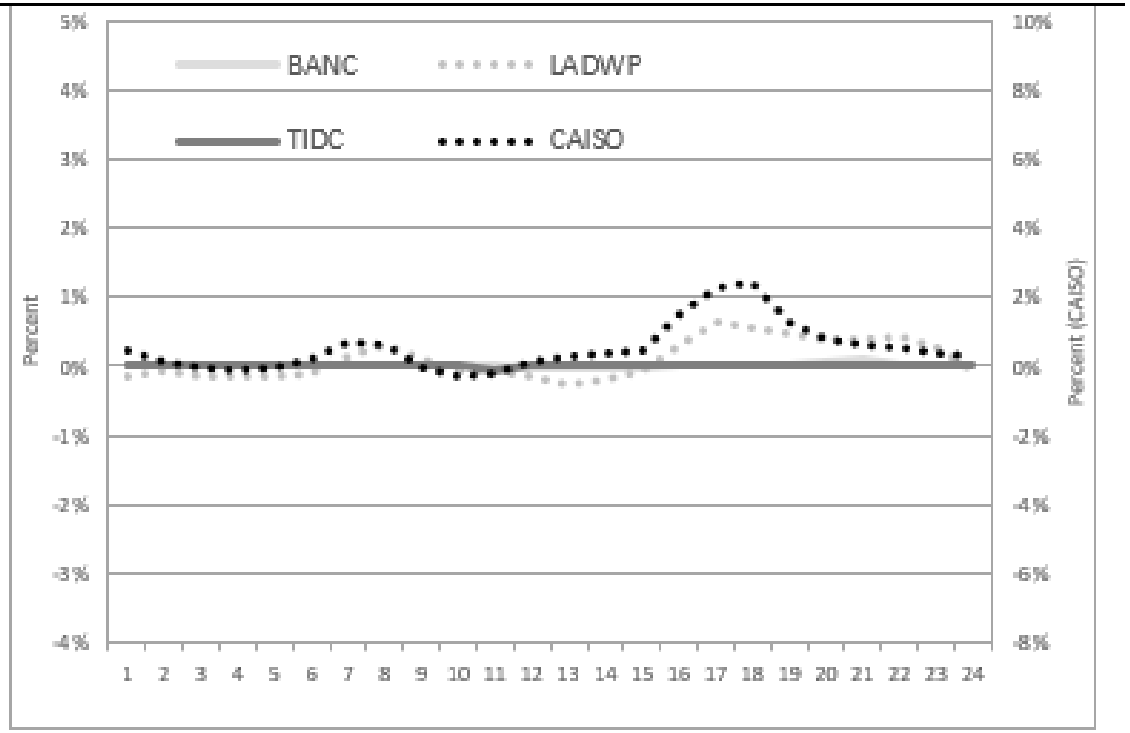


California: Average hourly load adjustments as a percent of average load by balancing area (Q4 2024)

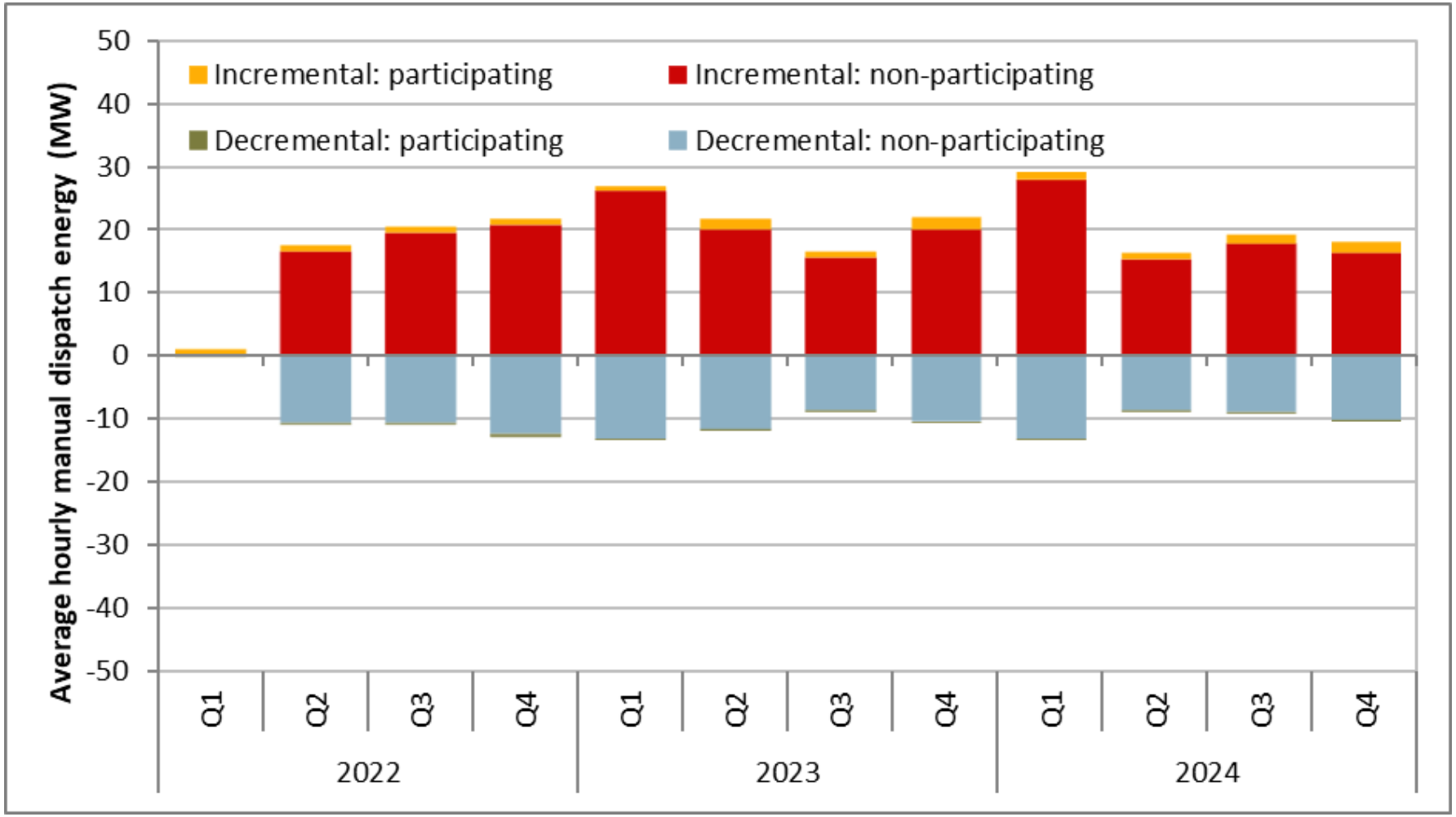
15-minute market



5-minute market

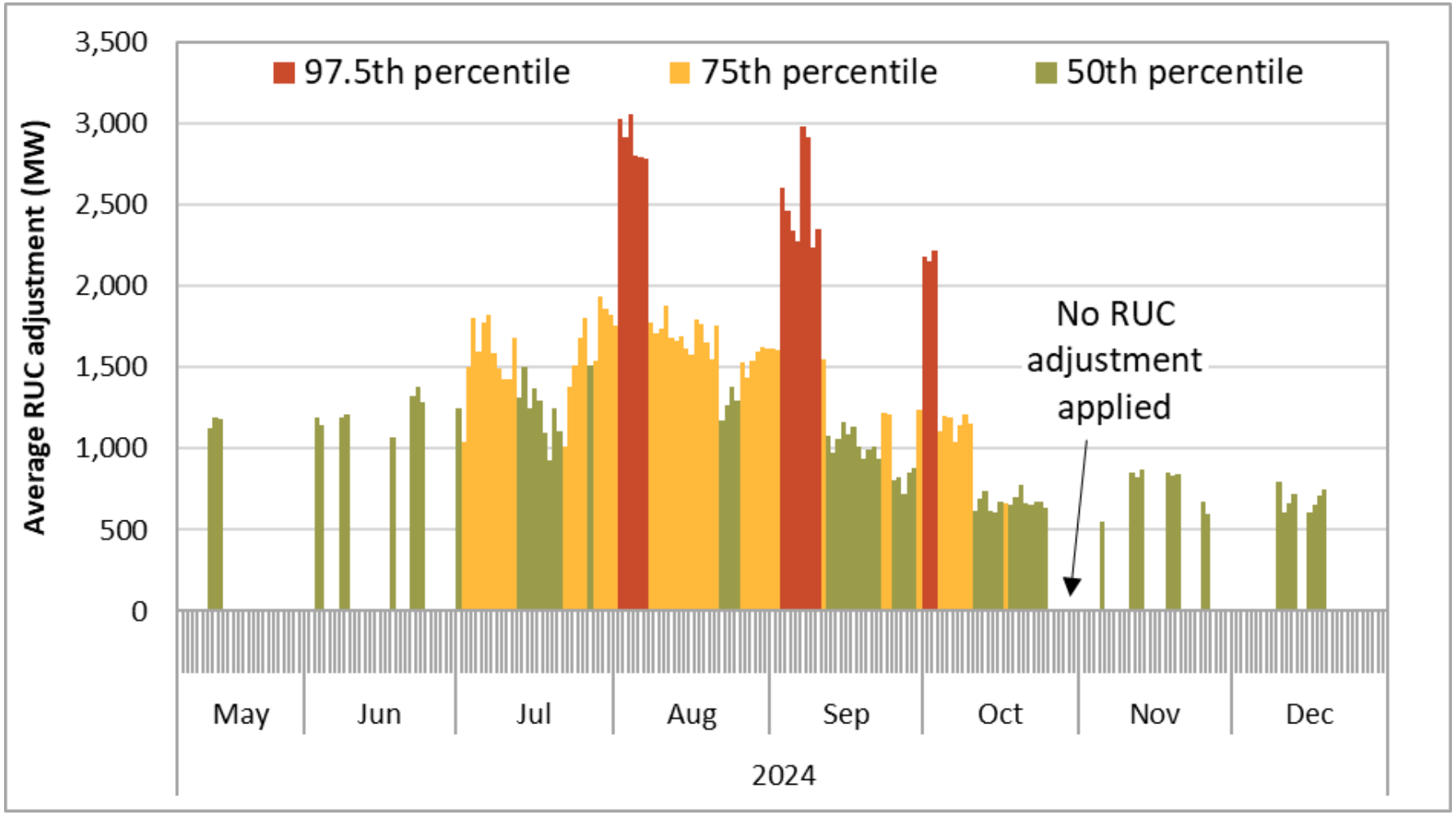


Average hourly WEIM manual dispatch energy - Pacific Northwest



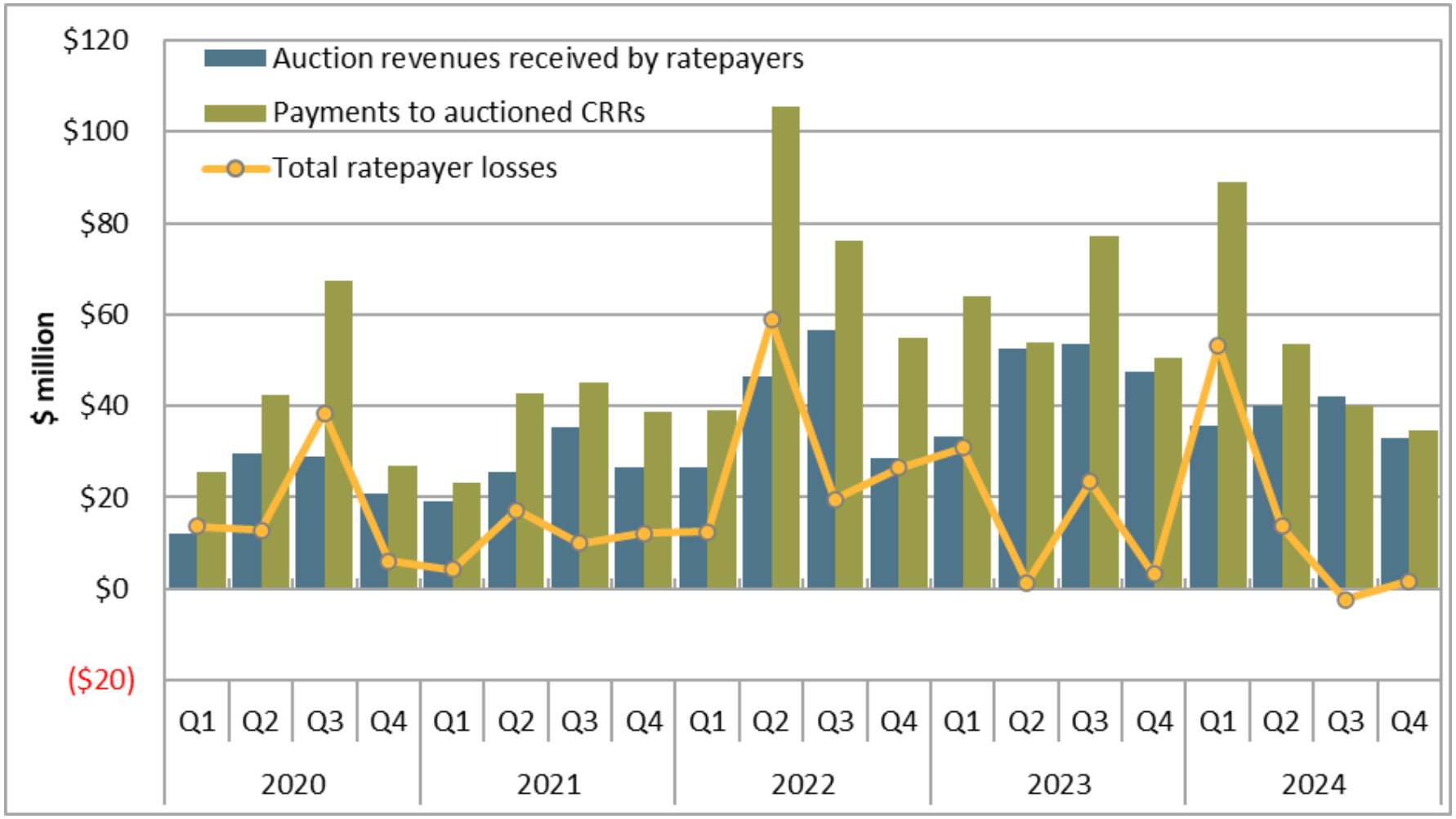
CAISO RUC adjustment targeted covering 97.5th percentile of uncertainty on only 3% of days in Q4 2024

Average residual unit commitment adjustment by day (peak morning and evening hours, May 7—December 31, 2024)



Transmission ratepayers lost about $1.7 million from auctioned CRRs in Q4 2024

Auction revenues and payments to non-load serving entities



Resource adequacy capacity in real-time was not sufficient to cover CAISO BA market requirements in 5 hours of Q4 2024

Resource adequacy bids vs market requirement

Date	Hour	Real-time requirement			Real-time resource adequacy bids			Total available RA - Total requirement
		Market requirement + losses	+ Regulation	+ Reserves	Resource adequacy + Above RA VERs	RA bids	Above RA VERs	
10/1/2024	19	39,340	39,870	42,129	40,893	40,681	211	-1,236
10/2/2024	19	41,066	41,596	44,001	42,641	41,283	1,358	-1,360
10/3/2024	19	39,808	40,338	42,662	42,194	41,095	1,099	-468
10/6/2024	19	37,207	37,737	39,930	38,508	37,956	552	-1,422
10/7/2024	19	39,858	40,388	42,743	41,469	40,722	746	-1,274

For more information …..

- Q4 2024 report on market issues and performance
  - https://www.caiso.com/documents/2024-fourth-quarter-report-on-market-issues-and-performance-mar-24-2025.pdf
- Department of Market Monitoring webpage
  - http://https://www.caiso.com/market-operations/market-monitoring
- CAISO Tariff, Appendix P
  - http://www.caiso.com/Documents/AppendixP_CAISODepartmentOfMarketMonitoring_asof_Apr1_2017.pdf
- Email questions to:
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  - DMM, DMM@caiso.com