California ISO

Market Performance and Planning Forum

Q1

Jan 27, 2026

Housekeeping

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The meeting is structured to stimulate dialogue and engage different perspectives.

Please engage in a respectful and professional manner.

Please keep comments brief and avoid repeating points already made so we can manage time and ensure everyone has an opportunity to participate.

You can access Closed Captioning and the Transparency Viewer using the controls located at the bottom of the Webex screen.

Instructions for Raising Your Hand to Ask a Question

If you are connected to audio through your computer or used the ‘call me’ option, select the raise hand icon located on the bottom of your screen.

If you are connected on the phone line only and not the Webex dial *3 to be added to the raise hand queue.

Please remember to state your name and affiliation before making your comment.

You may also send question via chat to all panelists.

If you need technical assistance during the meeting, please send a chat to the event producer at Intellor Events.

Paper & Presentation Material Posting Process

Working Groups:

Materials may be posted less than two days prior to the meetings due to the short turn-around of the discussions.

Proposal Development:

Papers are posted one week prior to the stakeholder meeting. Presentations are posted two days prior for stakeholder meetings.

CAISO Policy Initiative Stakeholder Process

[Learn more in the Stakeholder Process Guide.]

Objective: Enable dialogue on implementation planning and market performance issues

- Review key market performance topics
- Share updates to 2026-2027 release plans, resulting from stakeholders inputs

Market Performance and Planning Forum

Agenda – Jan 27, 2026
9 a.m. – 2 p.m. Pacific Time (PST)

Time:	Topic:	Slide	Presenter:
09:00 – 09:05	Introduction, Agenda	1-6	Brenda Marquez, Stakeholder Affairs
09:05 – 12:00	Market quality and performance • Review key market outcomes, current market enhancements and market issues tracked by the ISO. • Solar Rayborhood	8 – 101	Market Performance and Advanced Analytics Short Term Forecasting
12:00-01:00	Lunch Break	102	All
01:00-01:30	Policy Update	103-114	Market Policy Development
01:30-01:45	Release Update	114-	Release Management
01:45-02:00	Next Steps and Energy Blog Matters		Brenda Marquez, Stakeholder Affairs

Market Performance Update

Agenda for Market Performance Update

1. Executive summary
2. Energy storage performance
3. Load conformance
4. Bid Cost Recovery
5. Congestion and congestion revenue rights
6. Prices and market costs
7. Resource sufficiency test and assistance program
8. Market disruptions
9. RTPD Enhancement to consider terminal condition
10. Market issues
11. Renewable persistence enhancement

12. Appendix. General metrics

Executive Summary

Market performance in post-summer conditions has been relatively quiet

- The increasing penetration of storage resources in the system is leading to evolving patterns
  - Storage resources have saturated the regulation market
  - The charging of storage resources in midday hours has led to load peaking earlier in the day
  - Storage resources are dispatched to meet both morning and evening peaks
- Storage resources accrued 2.8 percent of all the bid cost recovery, while gas resources accrued 96.7 percent for 2025 in the day-ahead market

Market and process enhancements improve market efficiency

- Improvements to market processes have reduced CAISO's use of load conformance, lowering costs
- The ISO implemented on November 13 an enhancement to mitigate real-time market disruptions. The number of disruption observed after the enhancement has been minimal
- The ISO is pursuing an enhancement to commit long start units more efficiently
- The ISO is pursuing an enhancement for persistency forecasting of solar resources

Transparency efforts help the market stay informed

- The MPPF is reporting on five market issues
  1. Market mitigation software incorrectly designated certain transmission constraints as non-competitive, leading to over mitigation in five-minute market.
  2. For a single trade day, a day ahead ISO nomogram was associated with the incorrect balancing authority, affecting three hours when the constraint was binding but the marginal congestion component was incorrect for SP-TIE transactions.
  3. New proposed BPM changes associated with off-grid charging indicators raise awareness of bidding obligations for co-located energy storage resources claimed for flexible resource adequacy.
  4. Certain instances of incorrect Default Energy Bids being used which did not affect market prices.
  5. Compromised telemetry on an energy storage resource affected the real-time demand forecast for a BAA, highlighting the critical nature of accurate data quality on forecast performance.

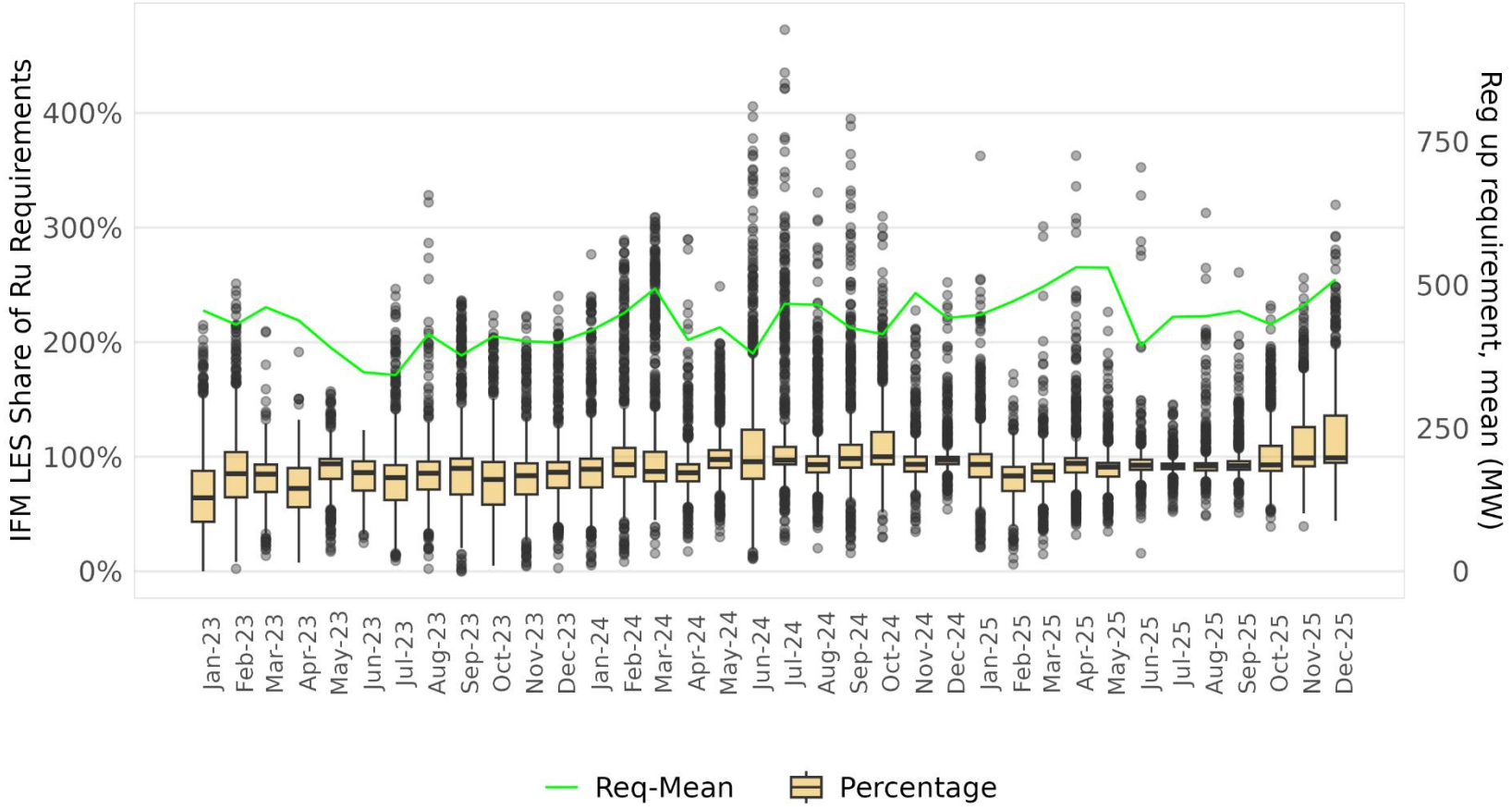
Energy Storage Performance

Market Performance and Advanced Analytics

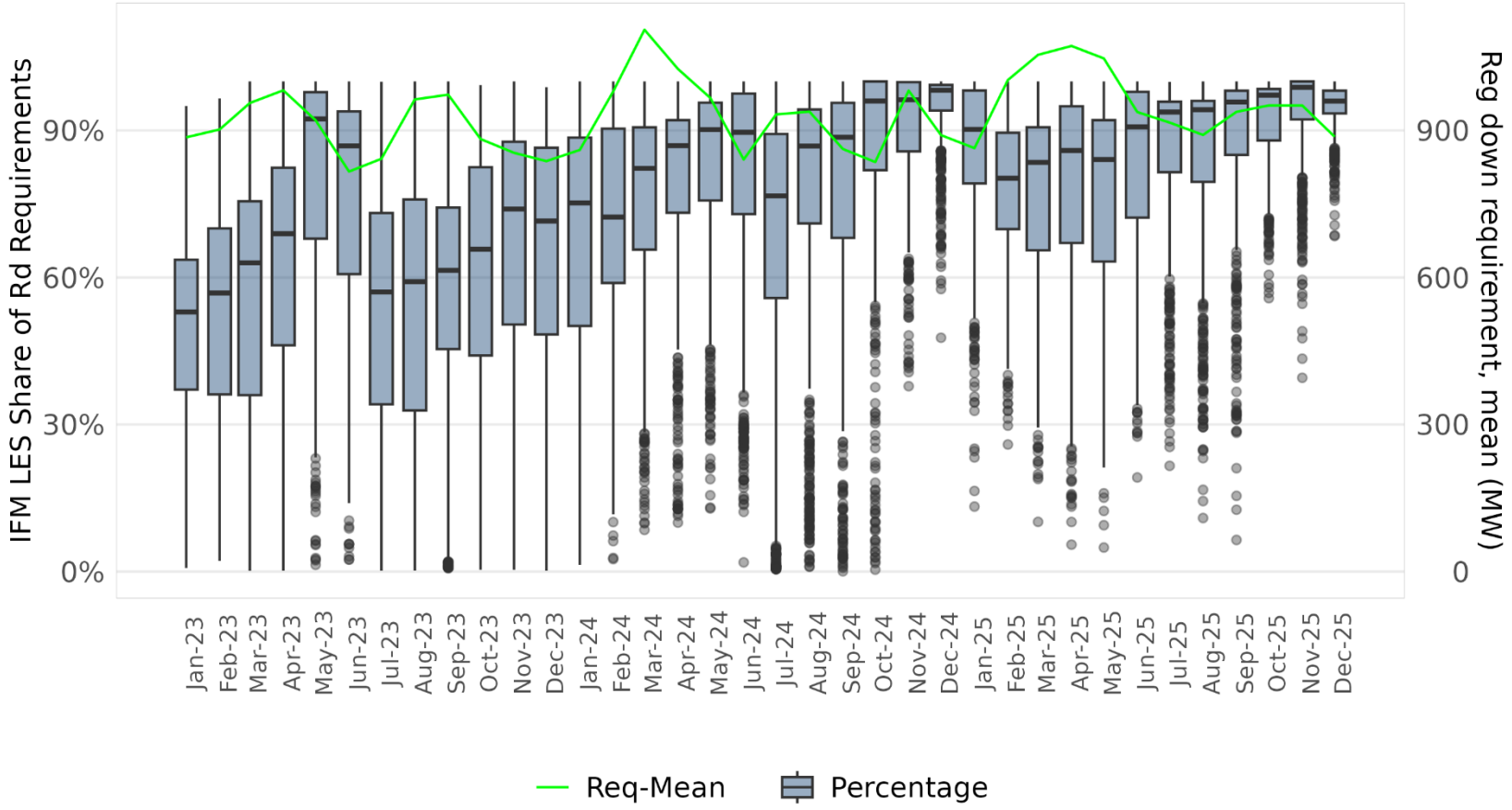
Storage resource performance -Summary

- Storage resources have saturated the regulation market
- The charging of storage resources in midday hours has led load to peaks earlier in the day
- Storage resources are dispatched to meet both morning and evening peaks

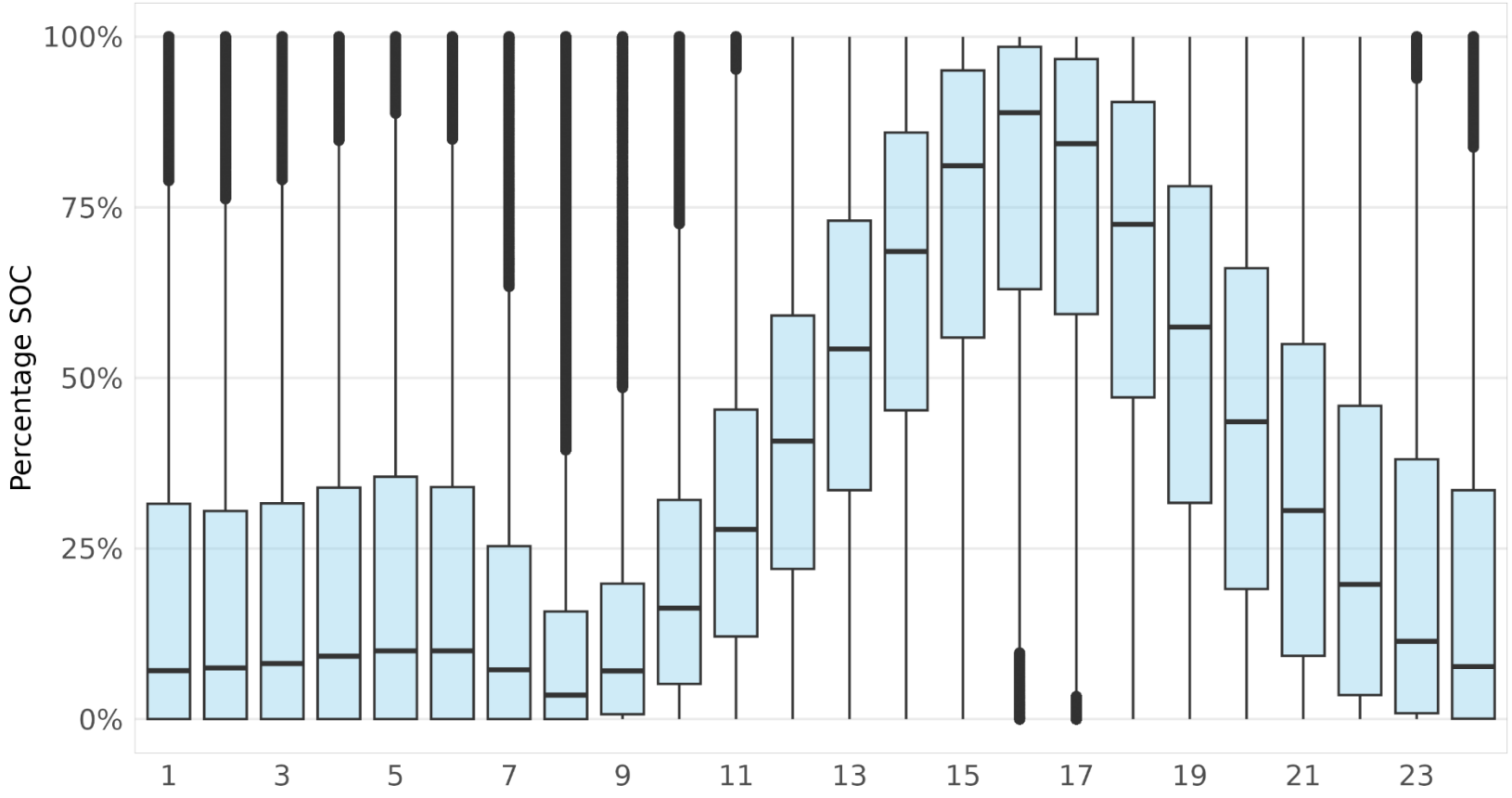
The market for upward regulation continues to be saturated by storage resources, which account for over 100 percent of the requirements



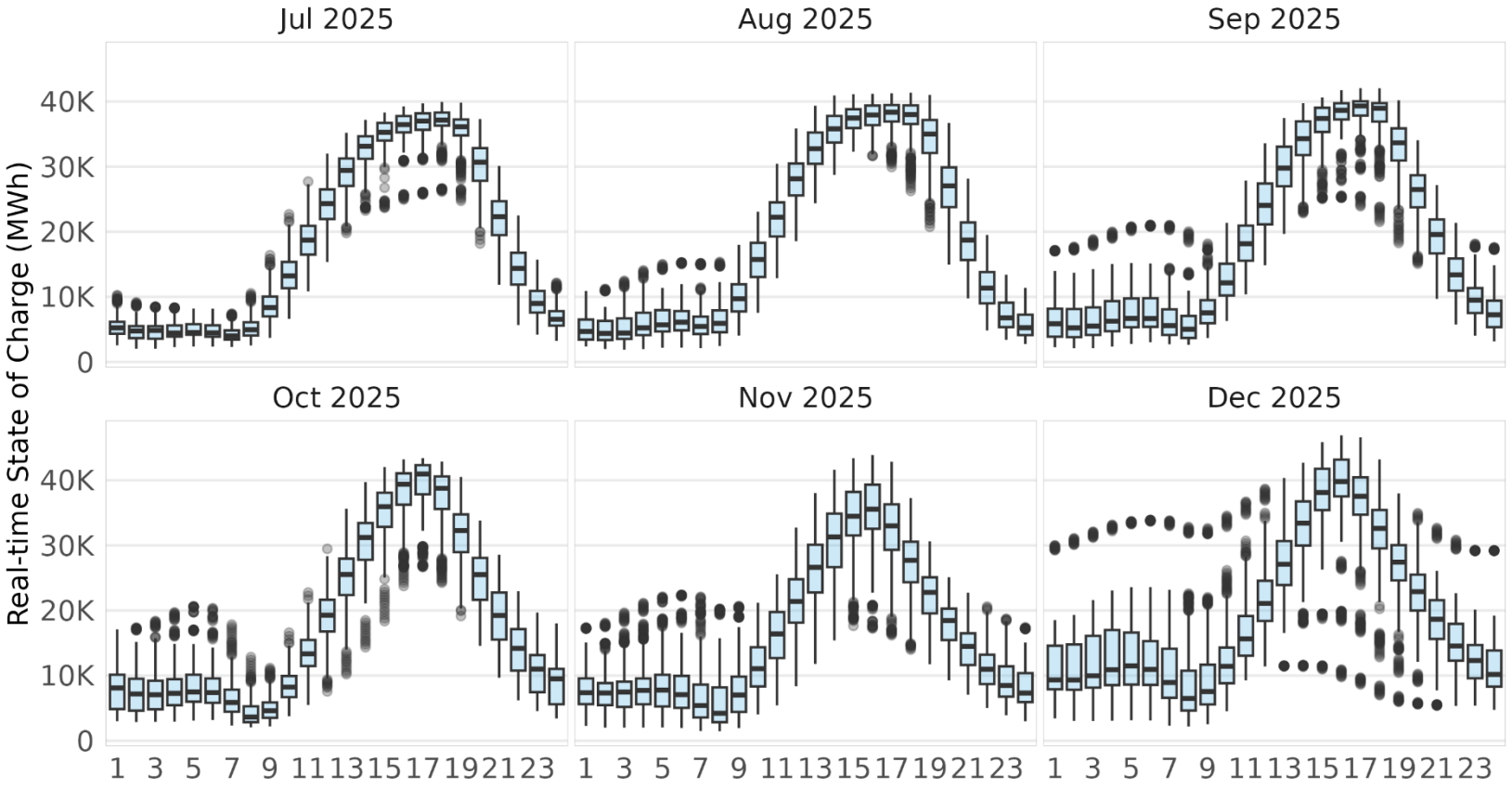
Procurement of regulation down continues to be dominated by storage resources



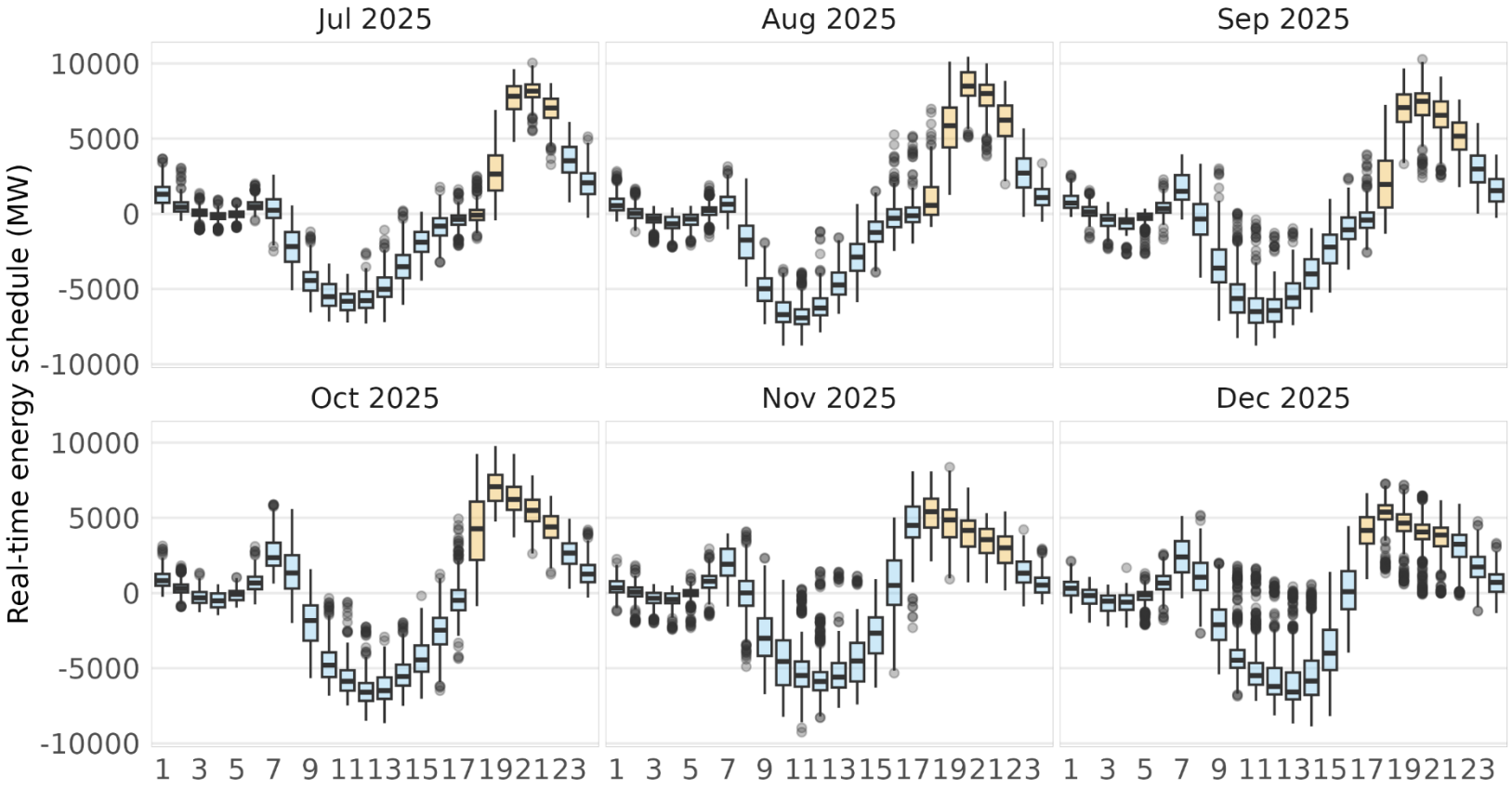
Storage resources frequently have state of charge (SOC) below their full capacity in Q4 2025



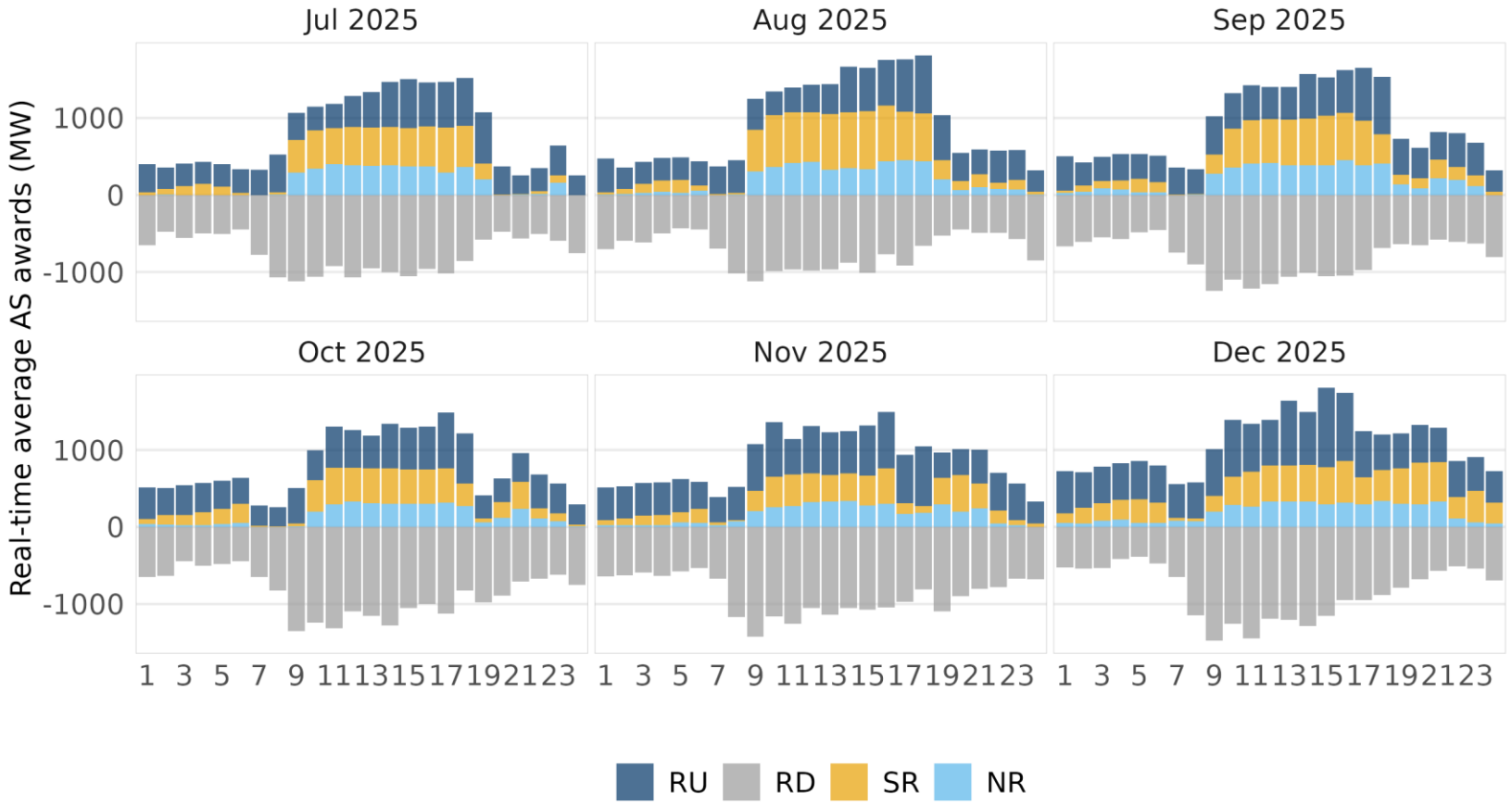
Real-Time State of charge for storage resources was in line with the day-ahead state of charge



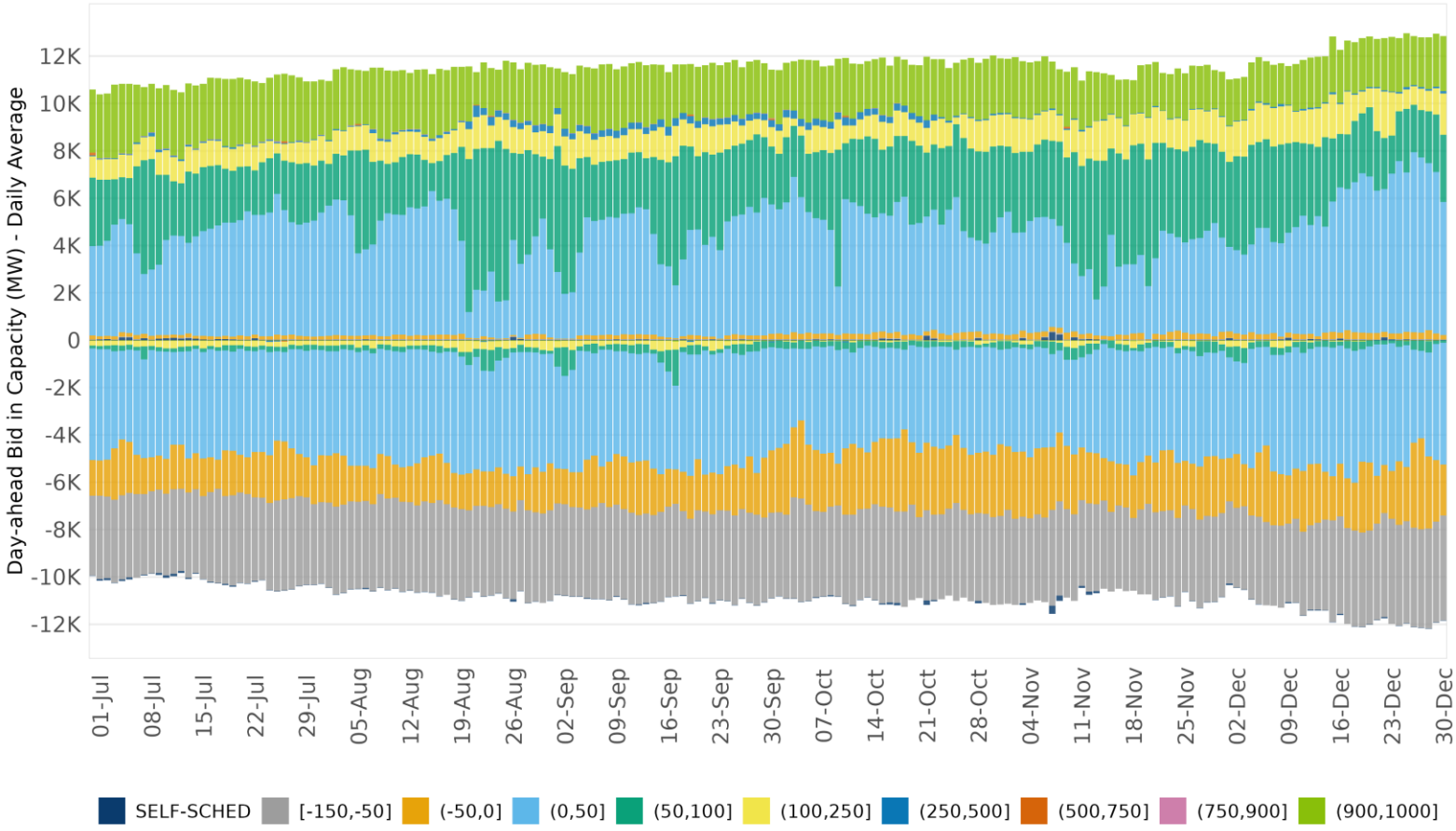
Storage resources were consistently charging during solar hours and discharging during net load peaks in the real-time



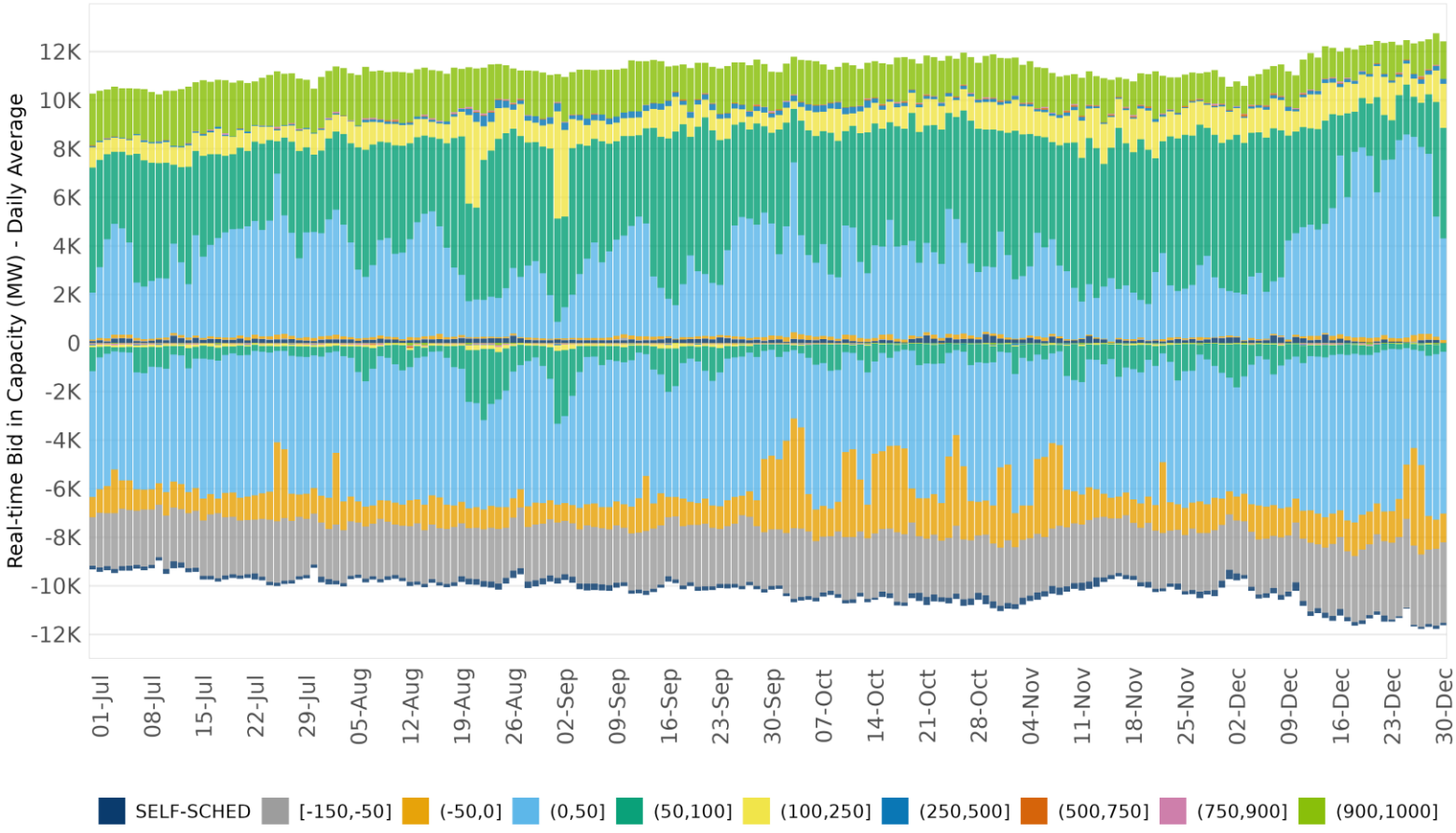
Storage resources mostly supply regulation and have increased the provision of spinning reserves in the real-time in recent months



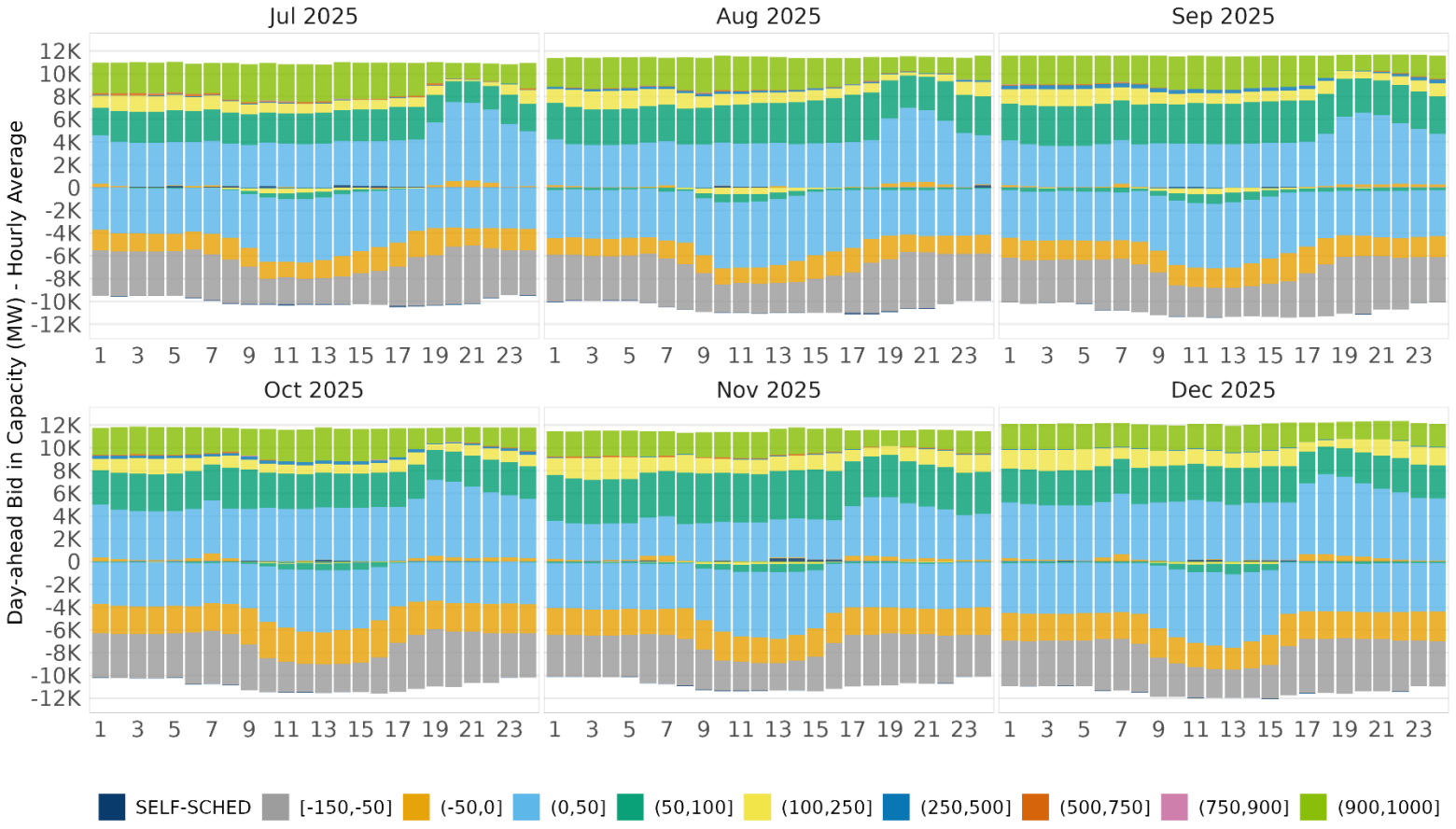
Battery bid in capacity has increased steadily in the second half of 2025 in the day-ahead



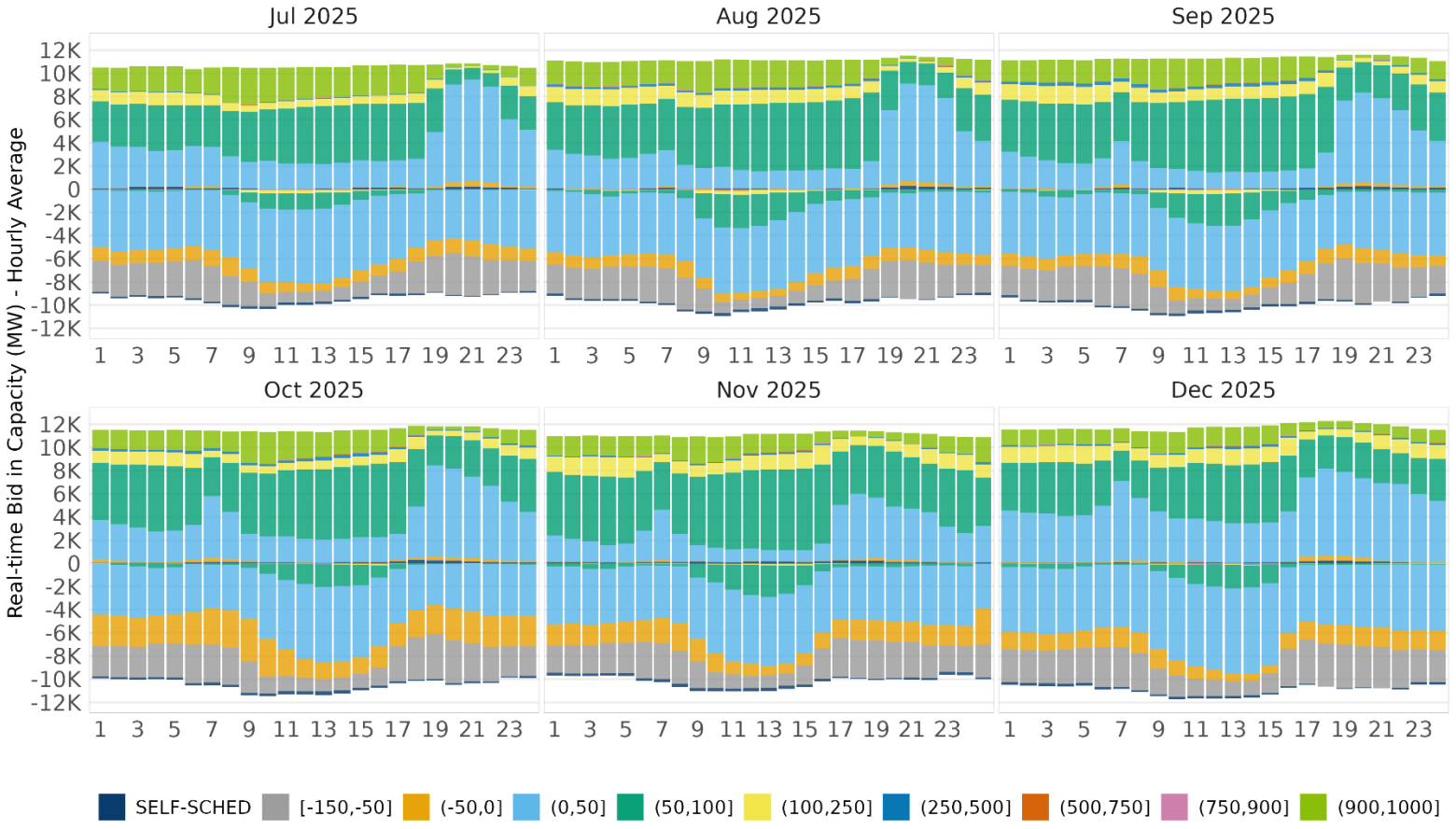
Battery bid in capacity shows steady increase in second half of 2025 – Real time



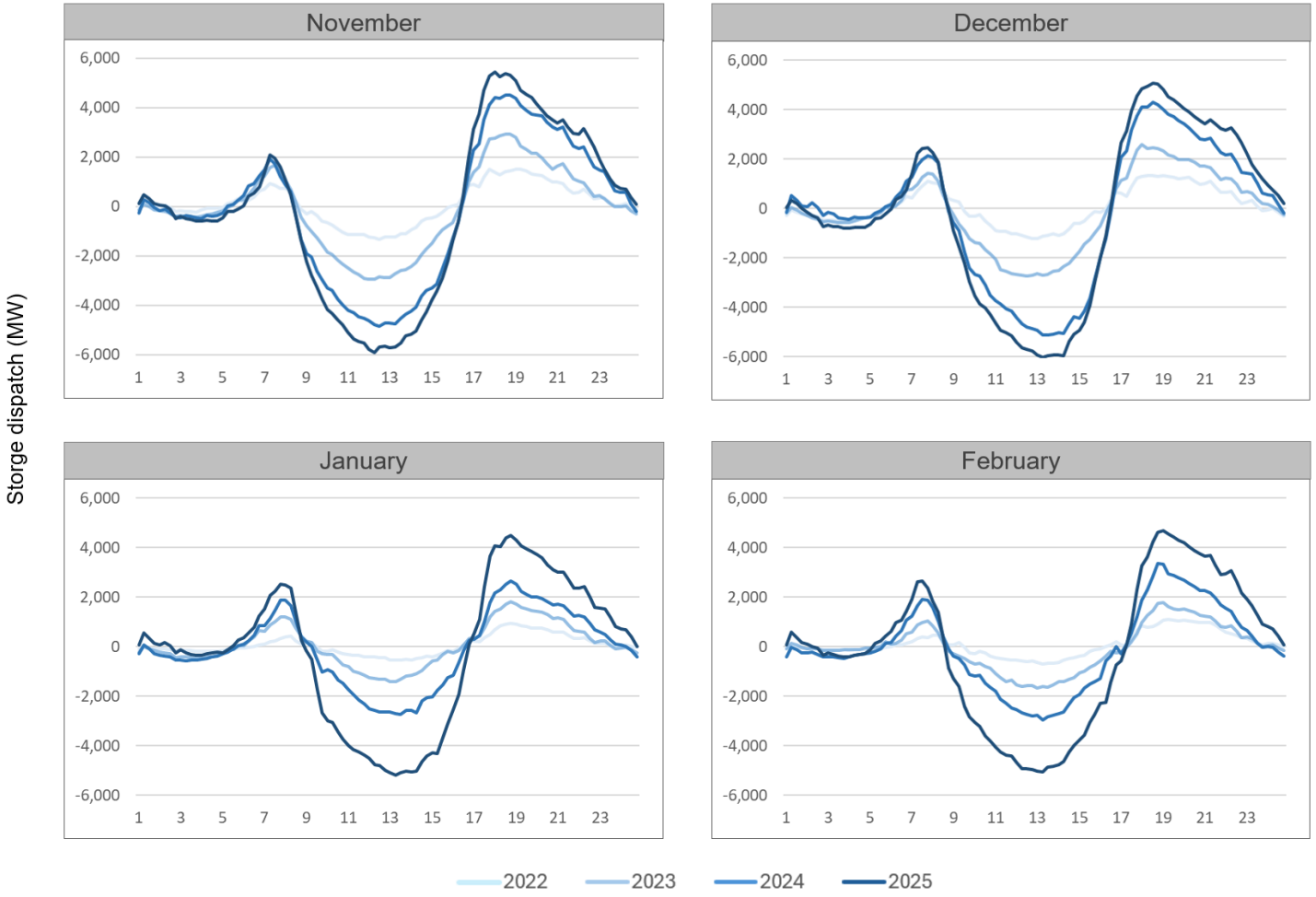
Batteries generally bid to charge during solar hours and discharge during the afternoon peak hours in the day-ahead.



Real-time bids broadly align with the day-ahead bid set, while showing stronger positioning.

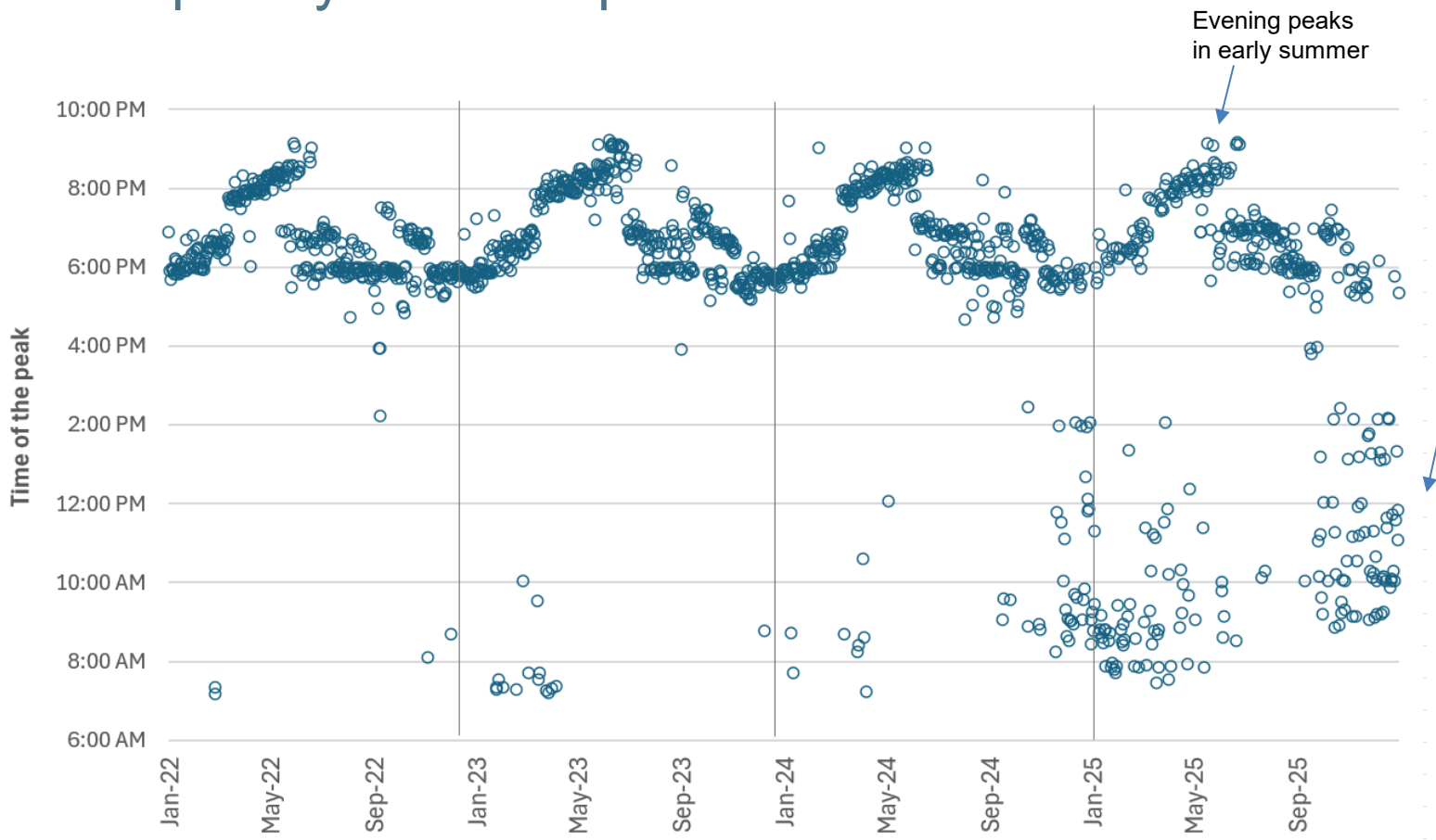


Storage resources have significantly increased energy arbitrage from midday hours to peak hours



Storage resources are discharge to help meet both morning and evening peaks

The increasing level of additional demand imposed by charging is shifting the daily demand peak to midday hours more frequently in winter periods

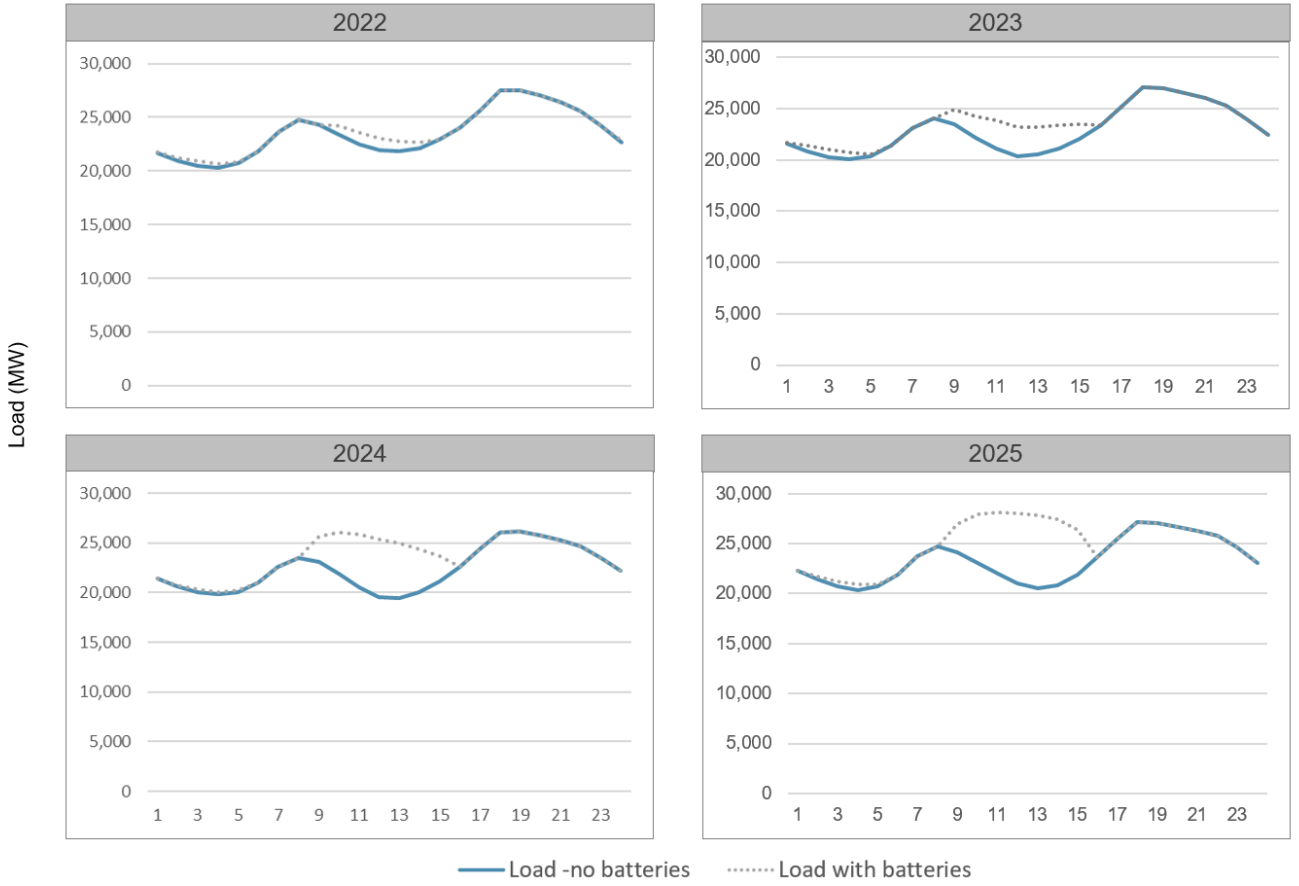


This profile reflects total load, which includes pump and charging of storage resources

The increasing level of additional demand imposed by charging is shifting the daily demand peak to midday hours more frequently in winter months

This profile reflects total load, which includes pump and charging of storage resources

This trend is based on a sample period of November



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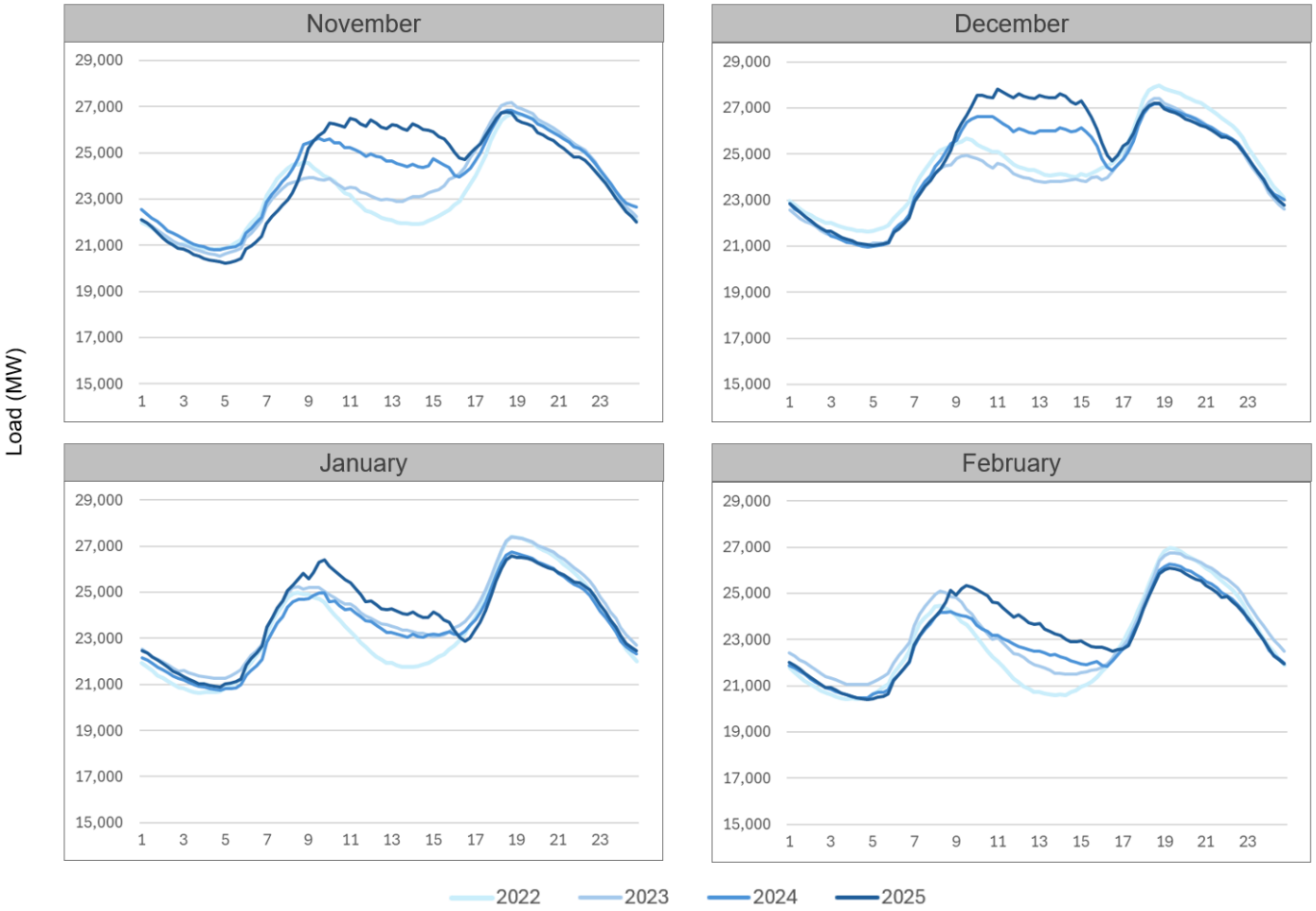
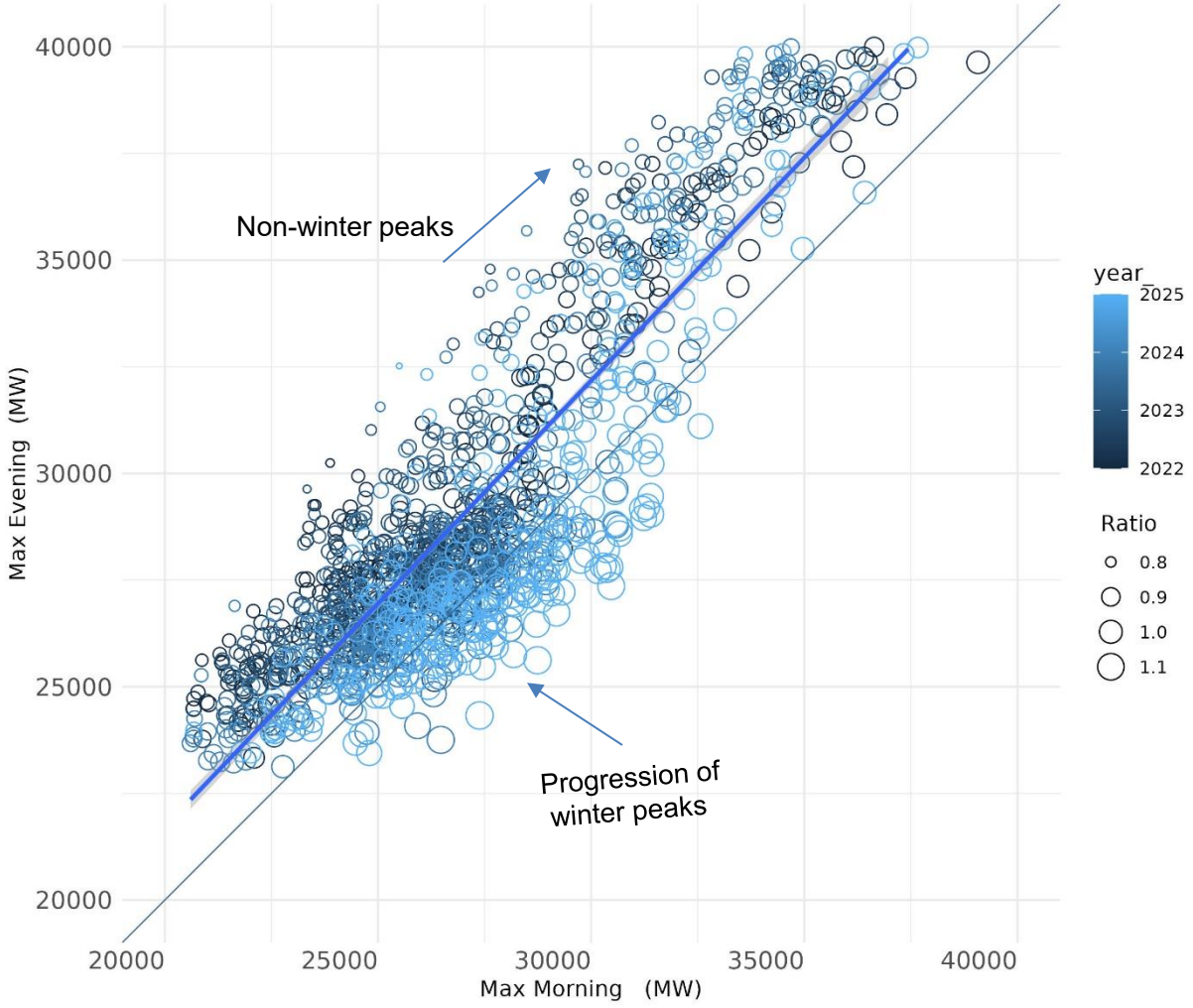
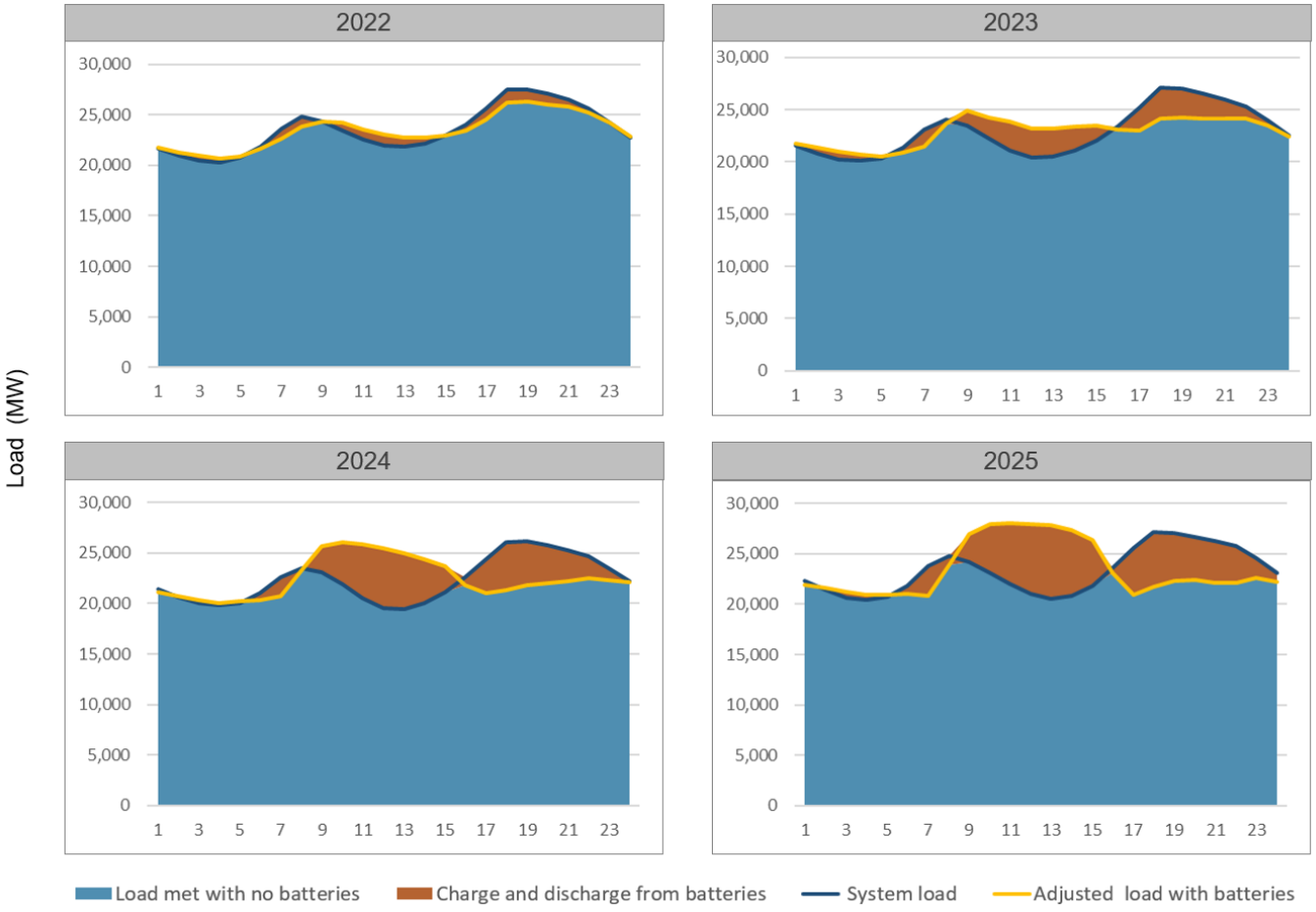


In winter periods, the daily peak of total demand is occurring in the morning hours due to contributions of charging from batteries

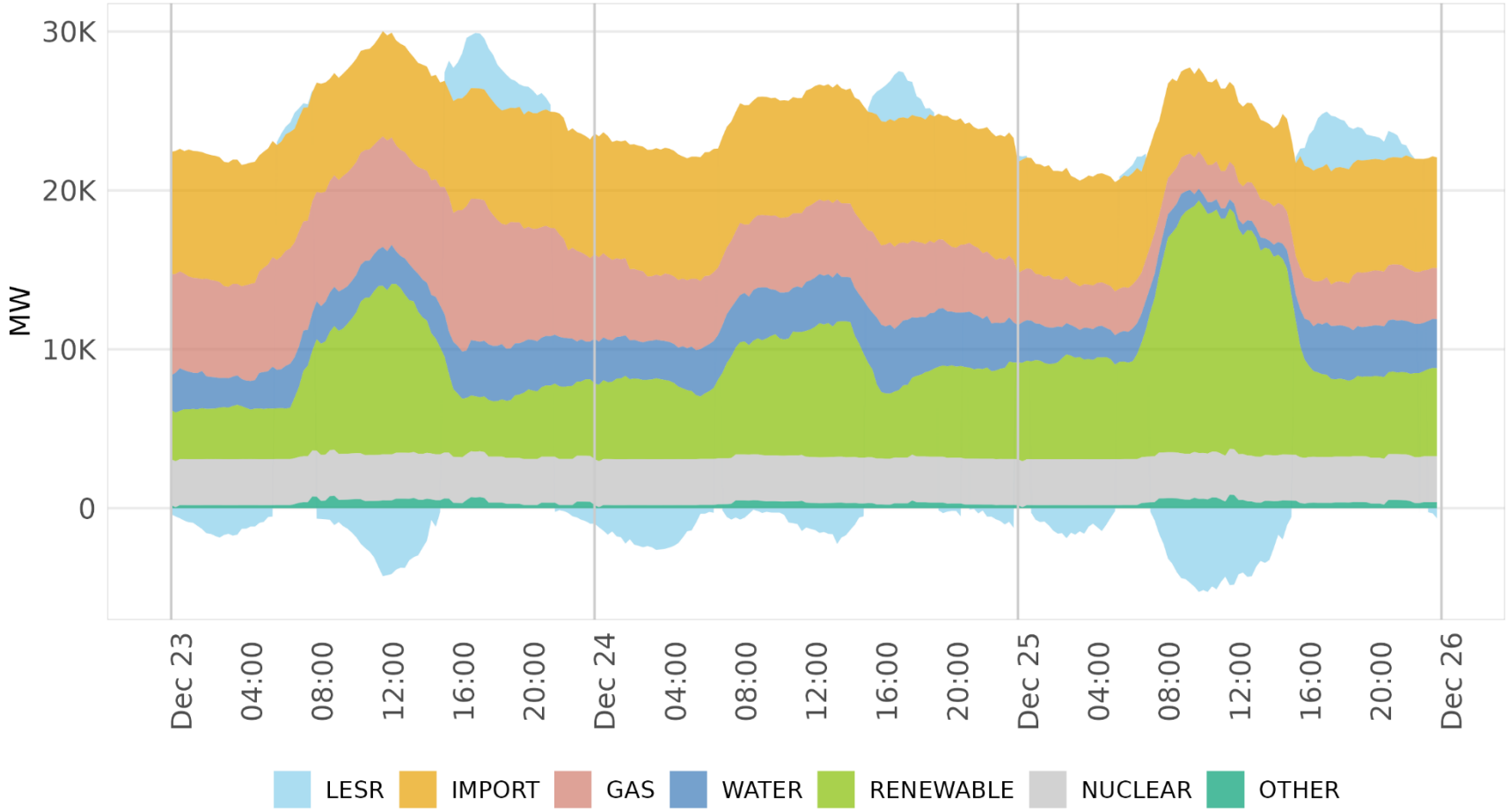


Storage resources are helping to flatten the load that needs to be met with conventional resources

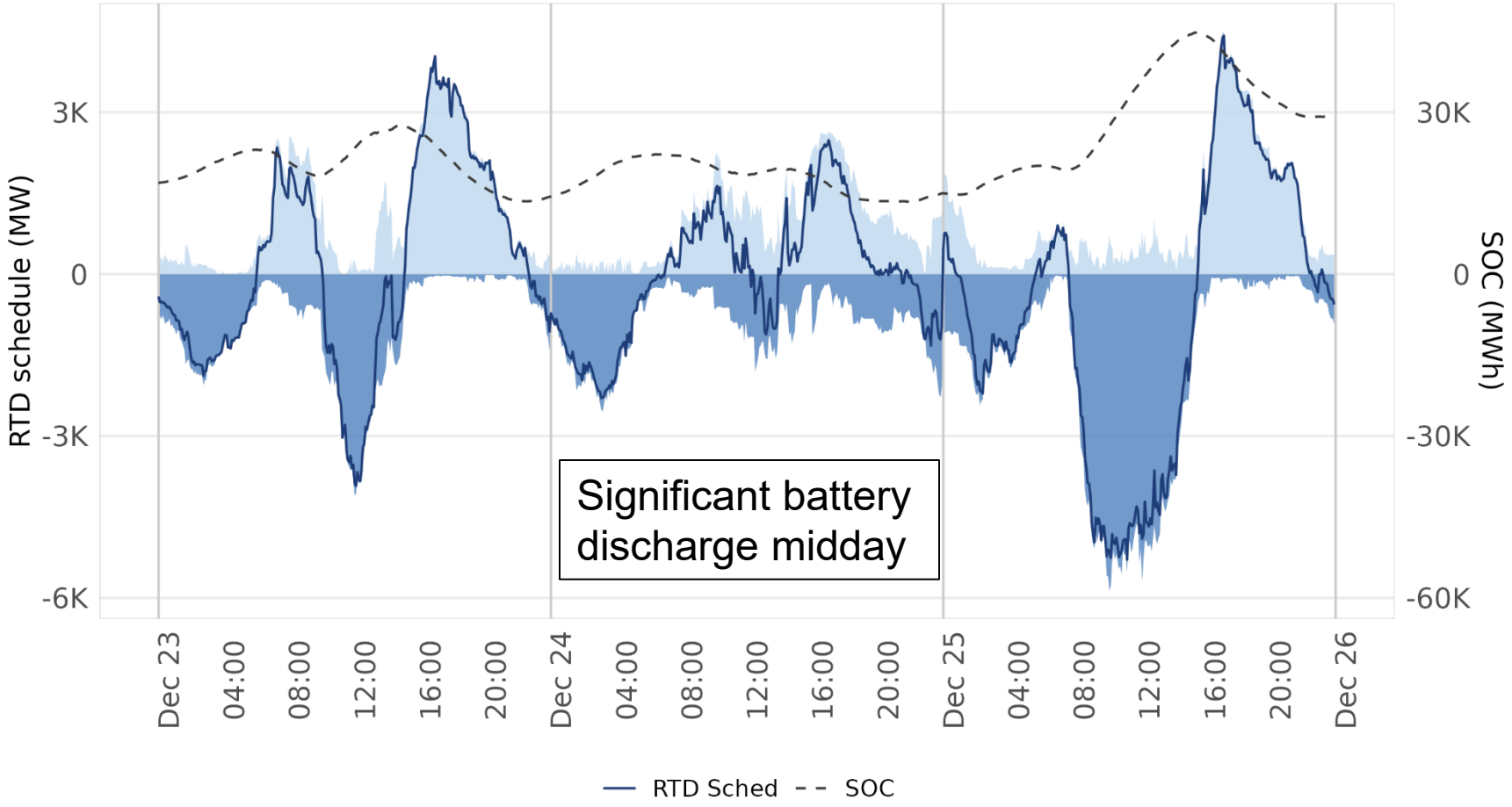


These trends are based on a sample periods of November

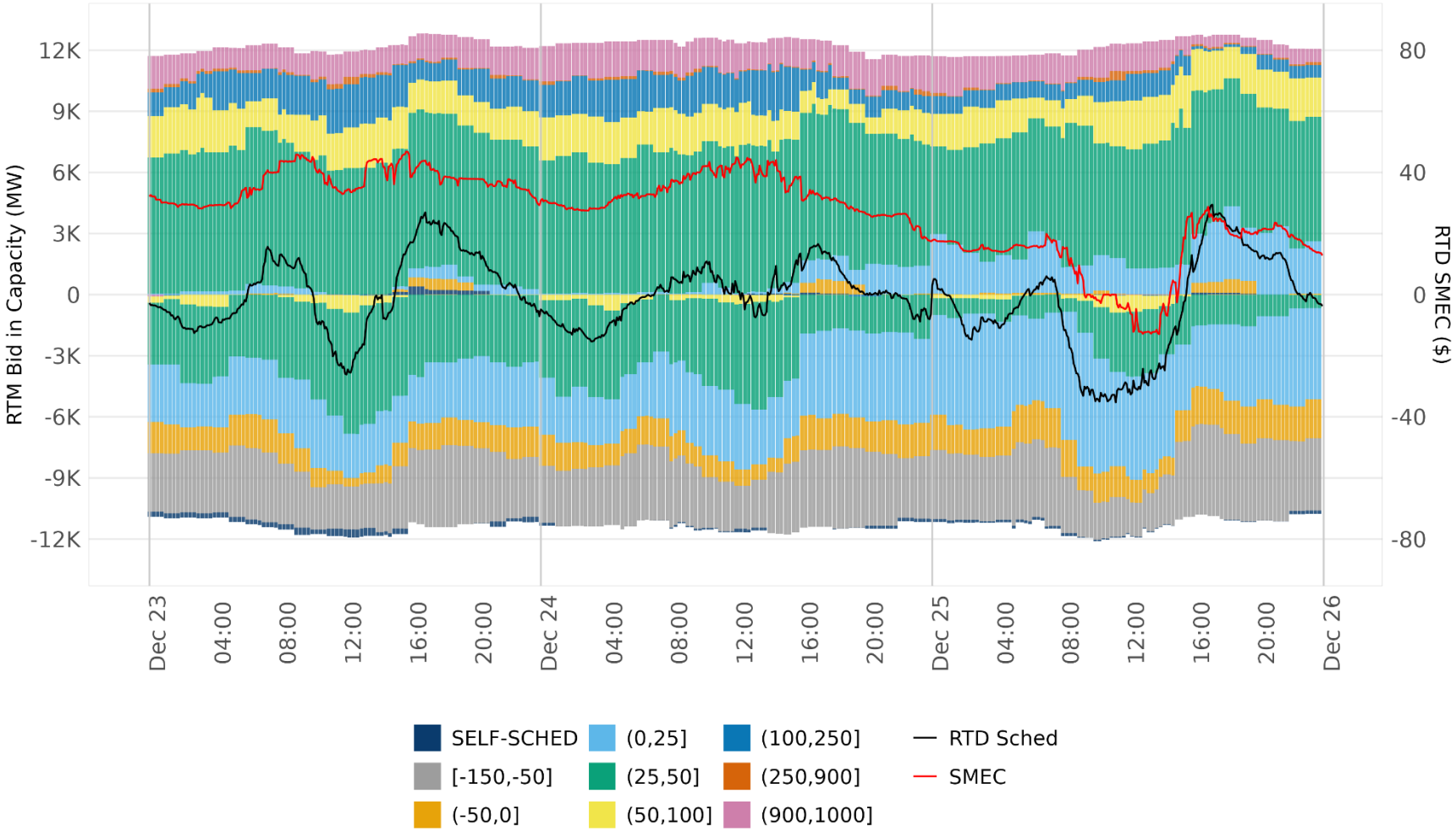
Low VER output resulted in real-time price increases – Why? Natural gas supply and imports replace loss of VER supply



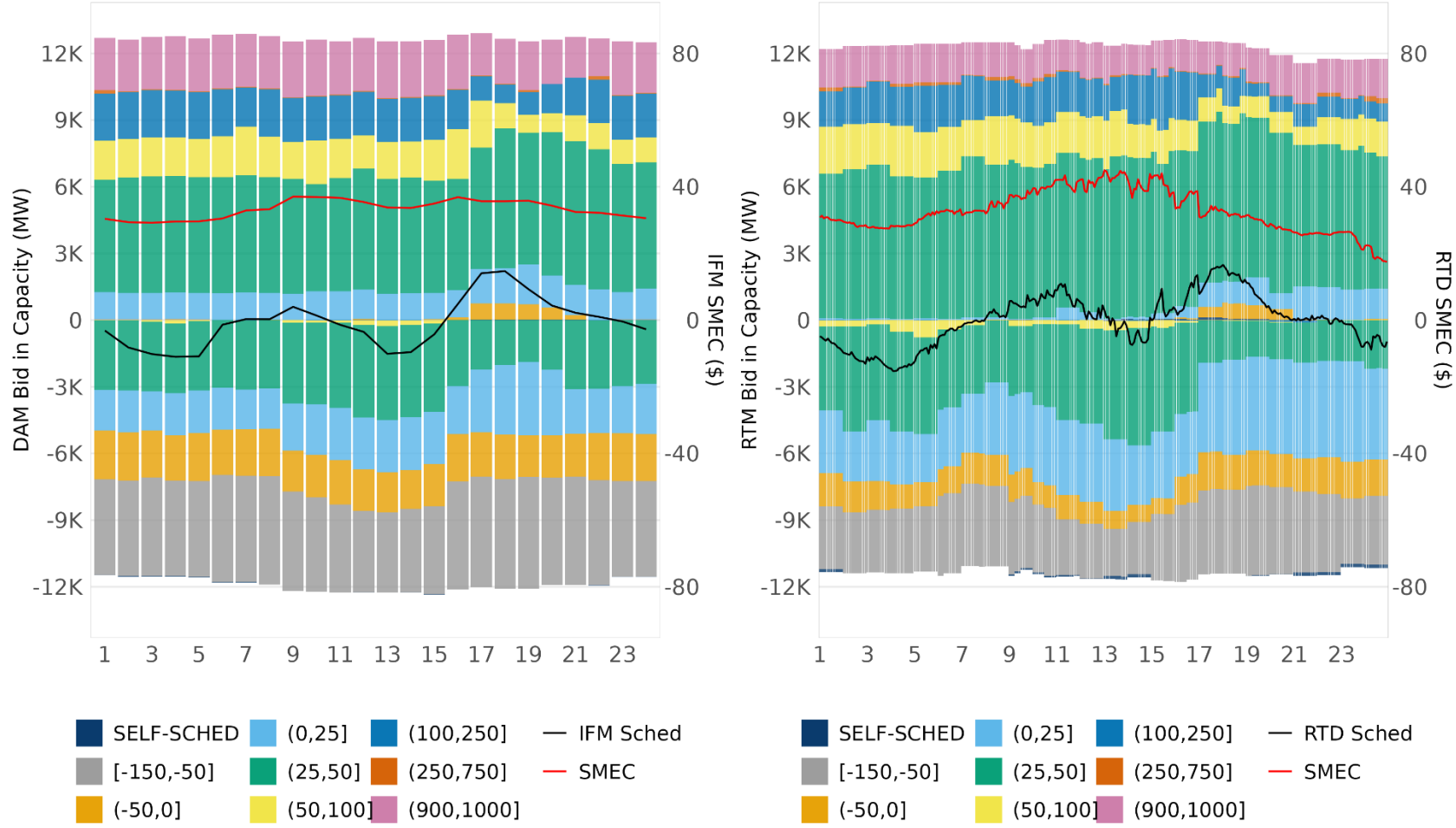
On Dec 24th, given higher midday clearing prices, batteries had minimum charging and indeed were economically discharging during midday hours



Low VER output resulted in real time price increases in the midday hours. Battery bids adapted to changing conditions.



On Dec 24th, real-time bids exhibit a slightly different profile relative to day-ahead projections, adapting to changing conditions



Load Conformance

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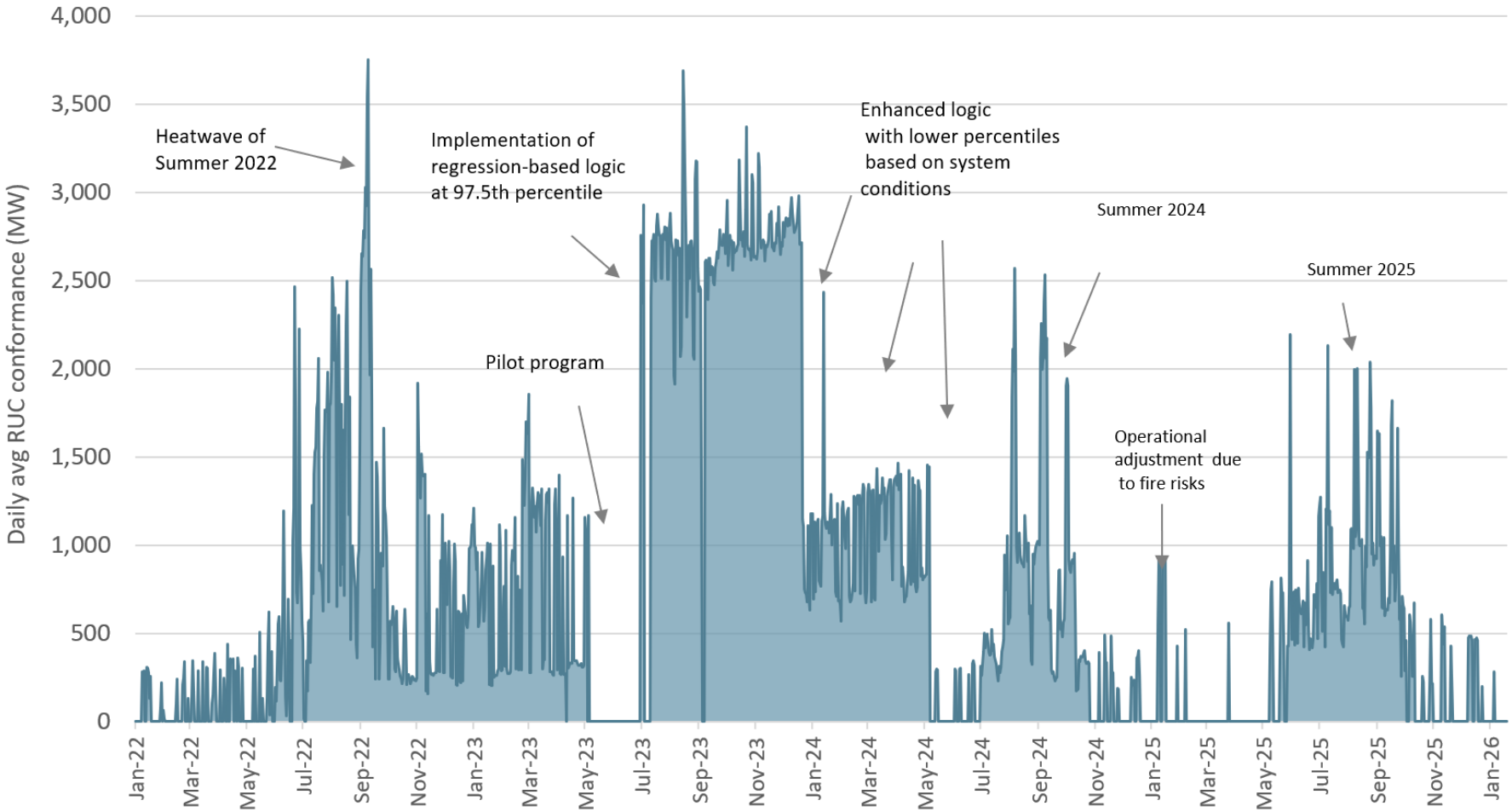
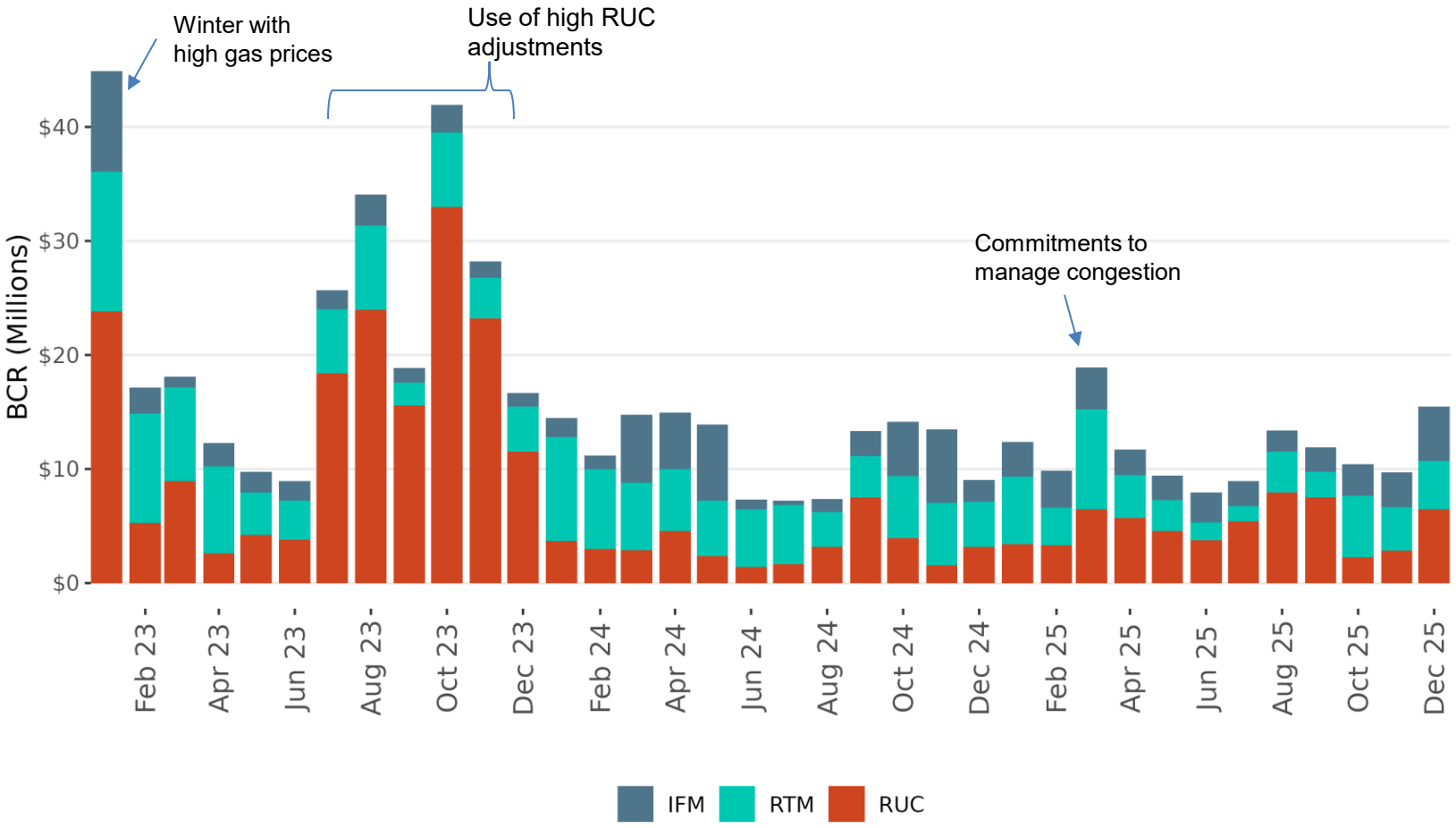
Load Conformance

- Load conformance in the ISO markets is a ubiquitous practice
- The ISO has pursued enhancements to the process to reduce the use of load conformance in both day-ahead and real-time
- A pilot program started in late December shows promising results to further reduce the use of load conformance in real time

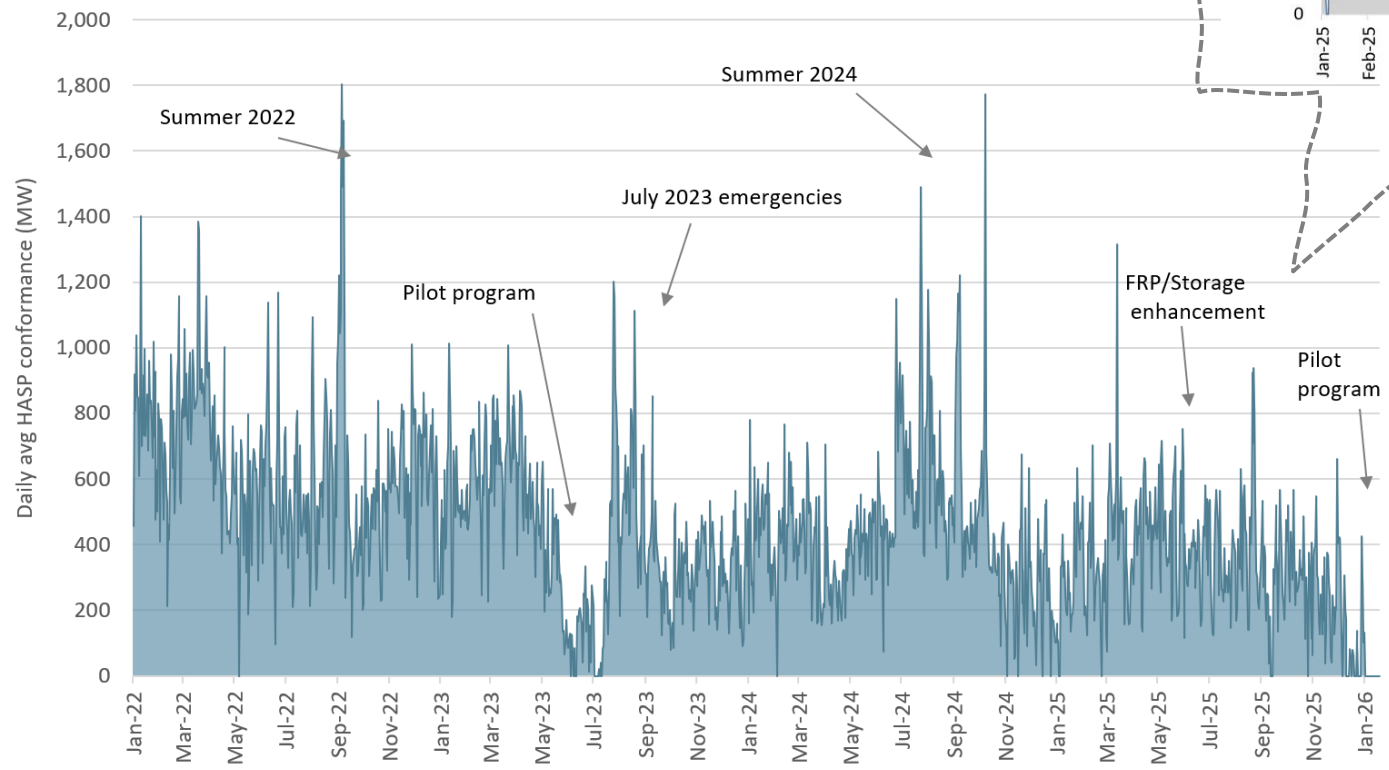
Between October 2025 and January 2026 RUC adjustments were minimal

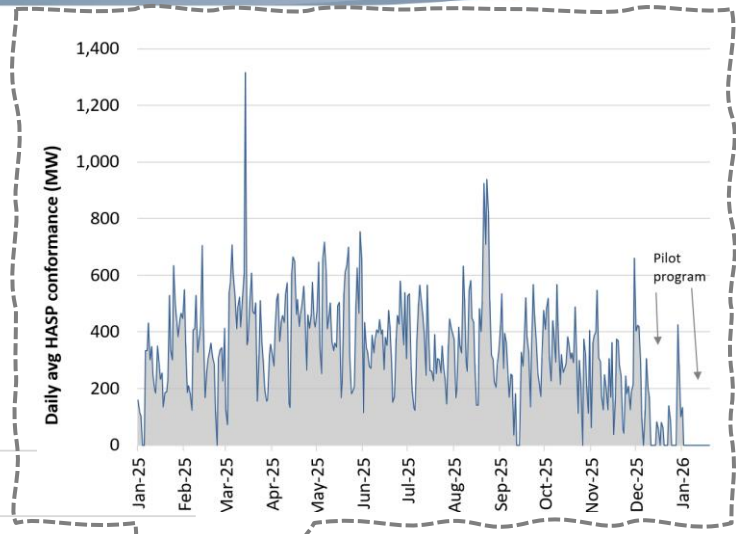


Bid cost recovery in RUC remains within typical ranges since December 2023

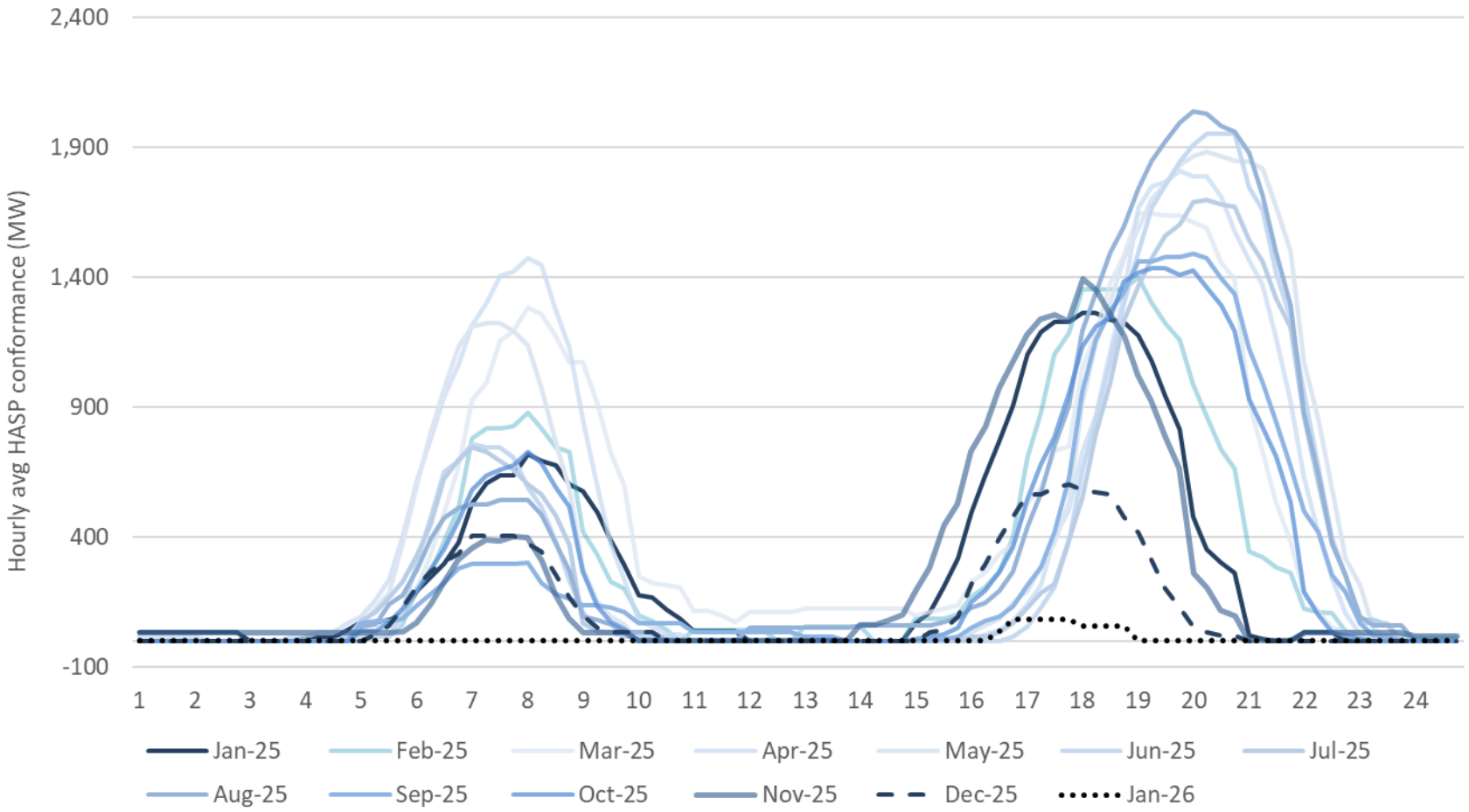


ISO has been running a pilot program in December and January to tackle root causes for load conformance in real time





Load conformance in HASP shows a significant reduction during the pilot trial (December 2025-January 2026)



Bid Cost Recovery

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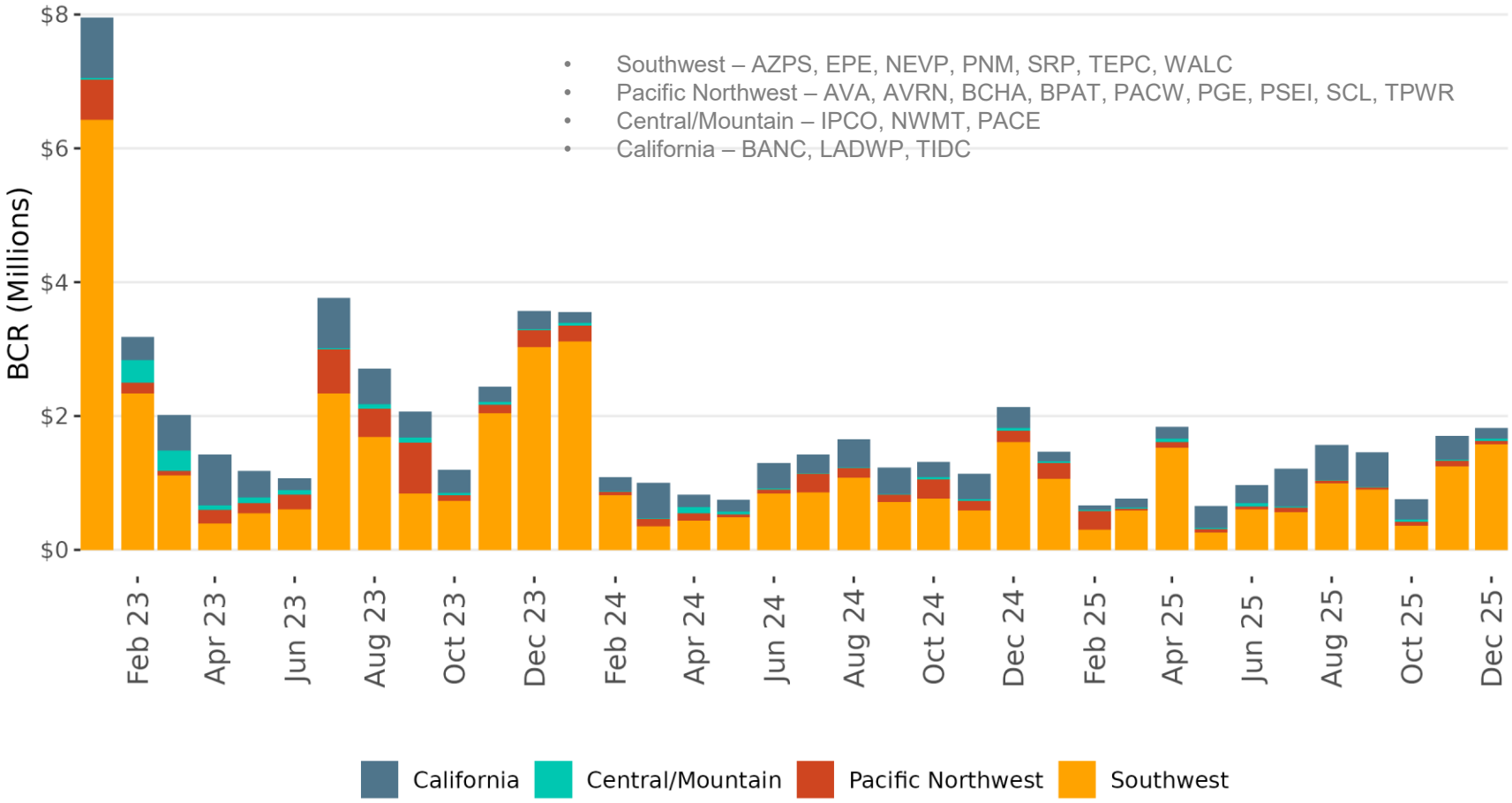
Bid Cost Recovery

- Storage resources accrued 2.8 percent of all the bid cost recovery, while gas resources accrued 96.7 percent for 2025 in the IFM market
- Bid cost recovery in the RUC process remained low after improvements to the RUC adjustment process
- Southwestern areas accounted for 67 percent of total Bid Cost Recovery to all WEIM entities
- Gas and Storage resources make up 82% and 9.2% of CISO bid cost recovery respectively in the real-time for 2025

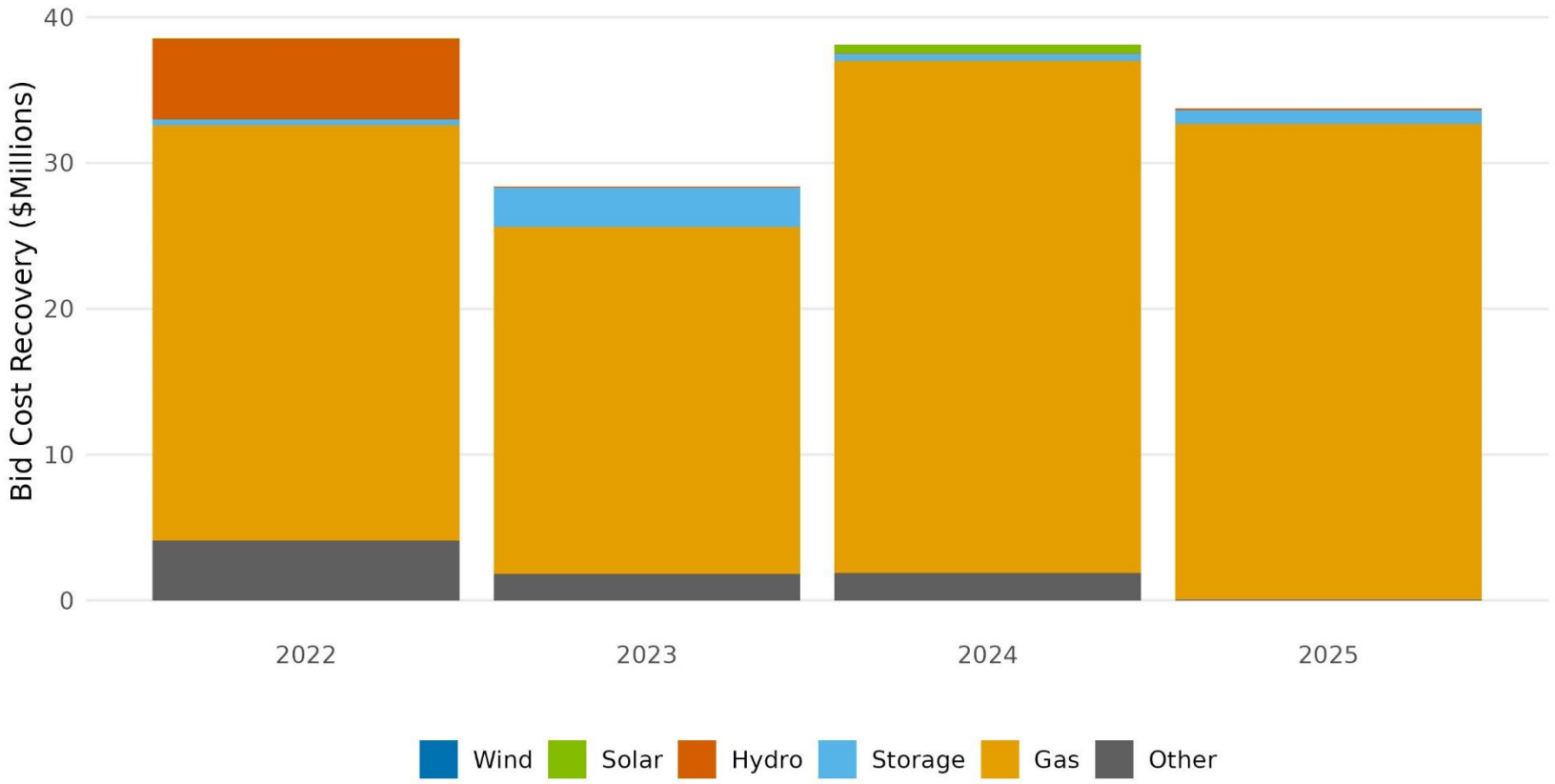
Southwest WEIM entities has accrued about 67 percent of total Bid Cost Recovery to all WEIM entities



* Does not include CAISO

ISO bid cost recovery by fuel type – IFM

Gas and Storage resources make up 96.7% and 2.8% of BCR respectively in the IFM for 2025



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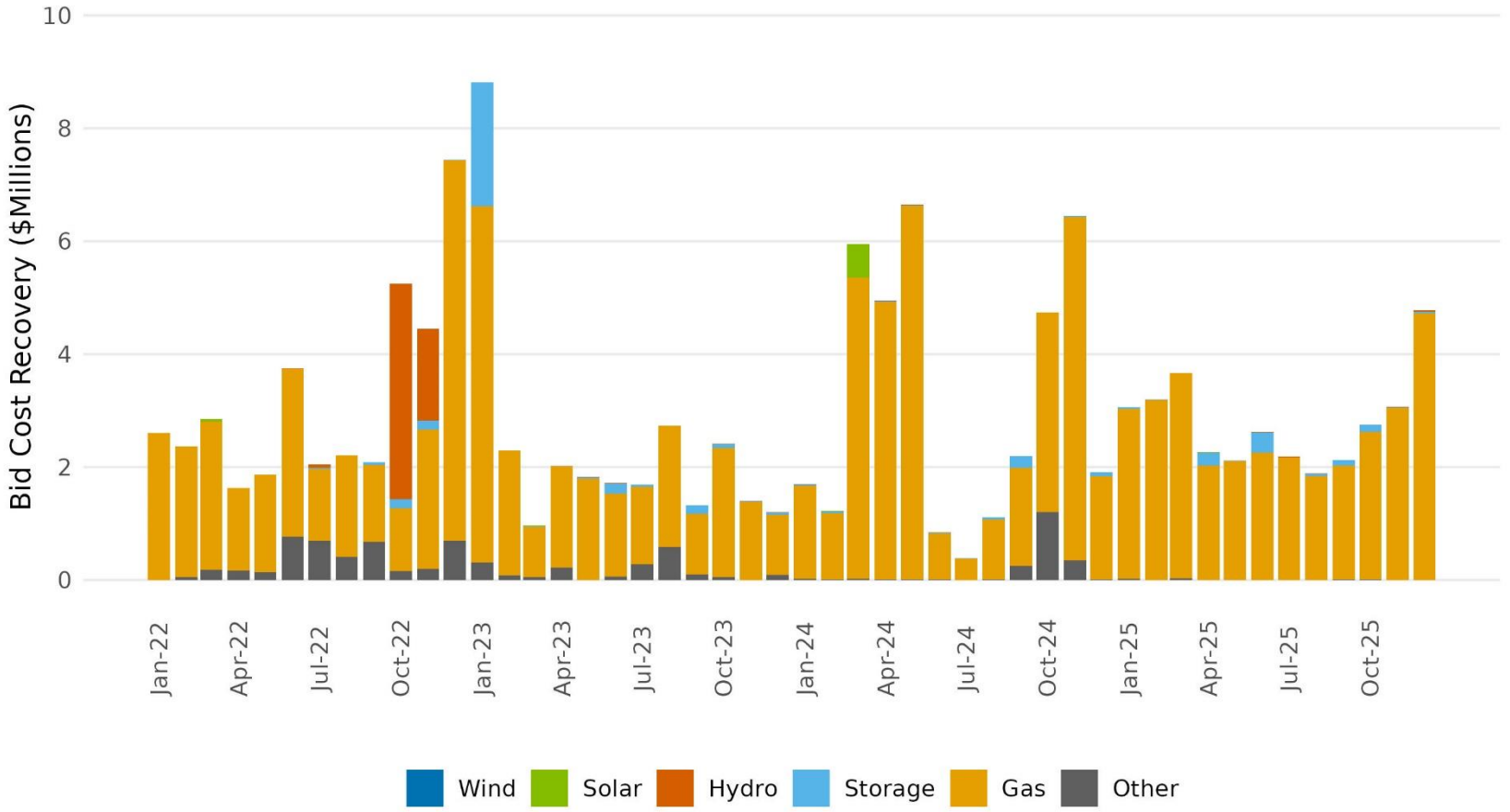
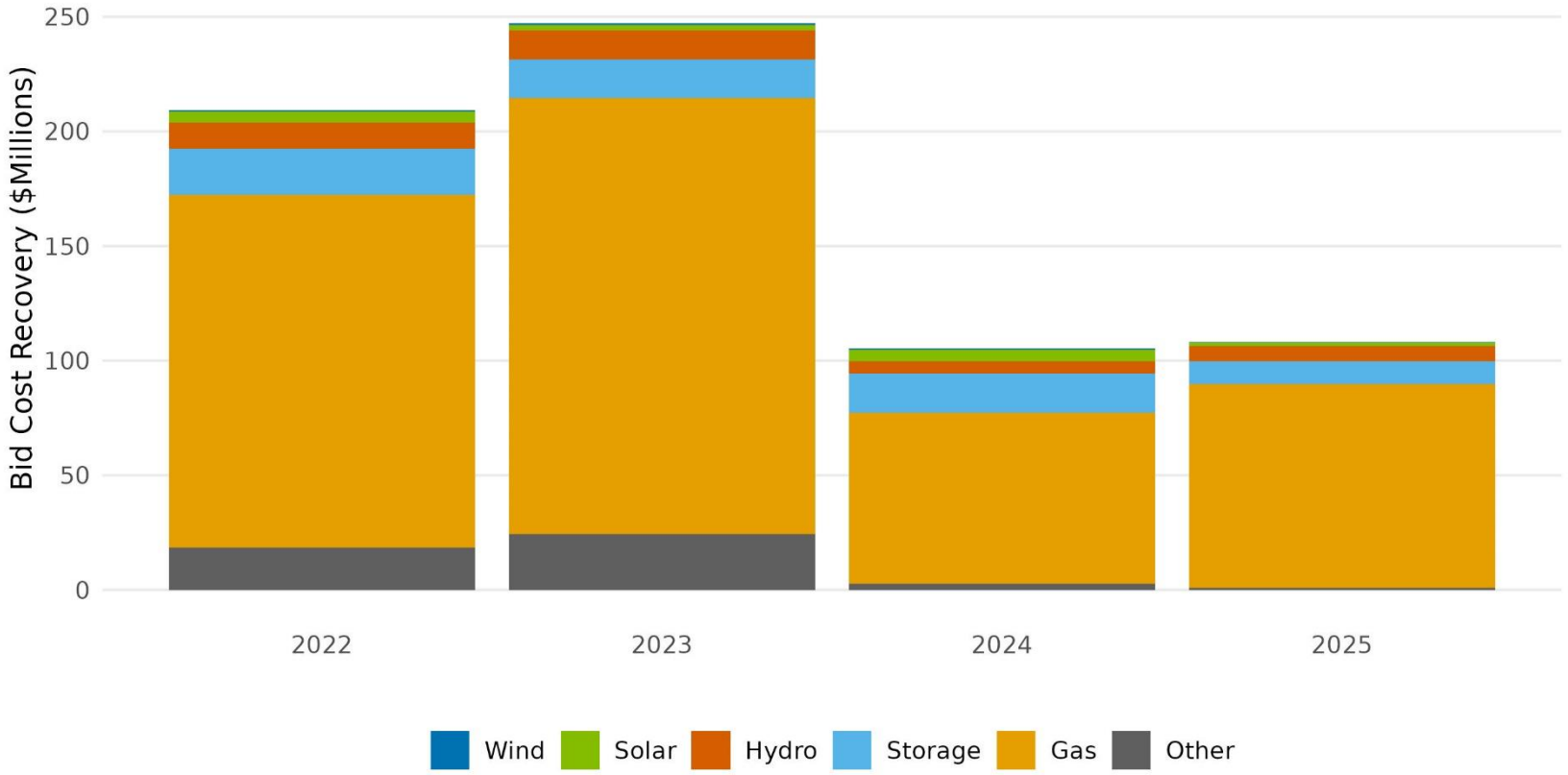


ISO bid cost recovery by fuel type – RTM

Gas and Storage resources make up 82% and 9.2% of CISO BCR respectively in the RTM for 2025



ISO bid cost recovery by fuel type – RTM

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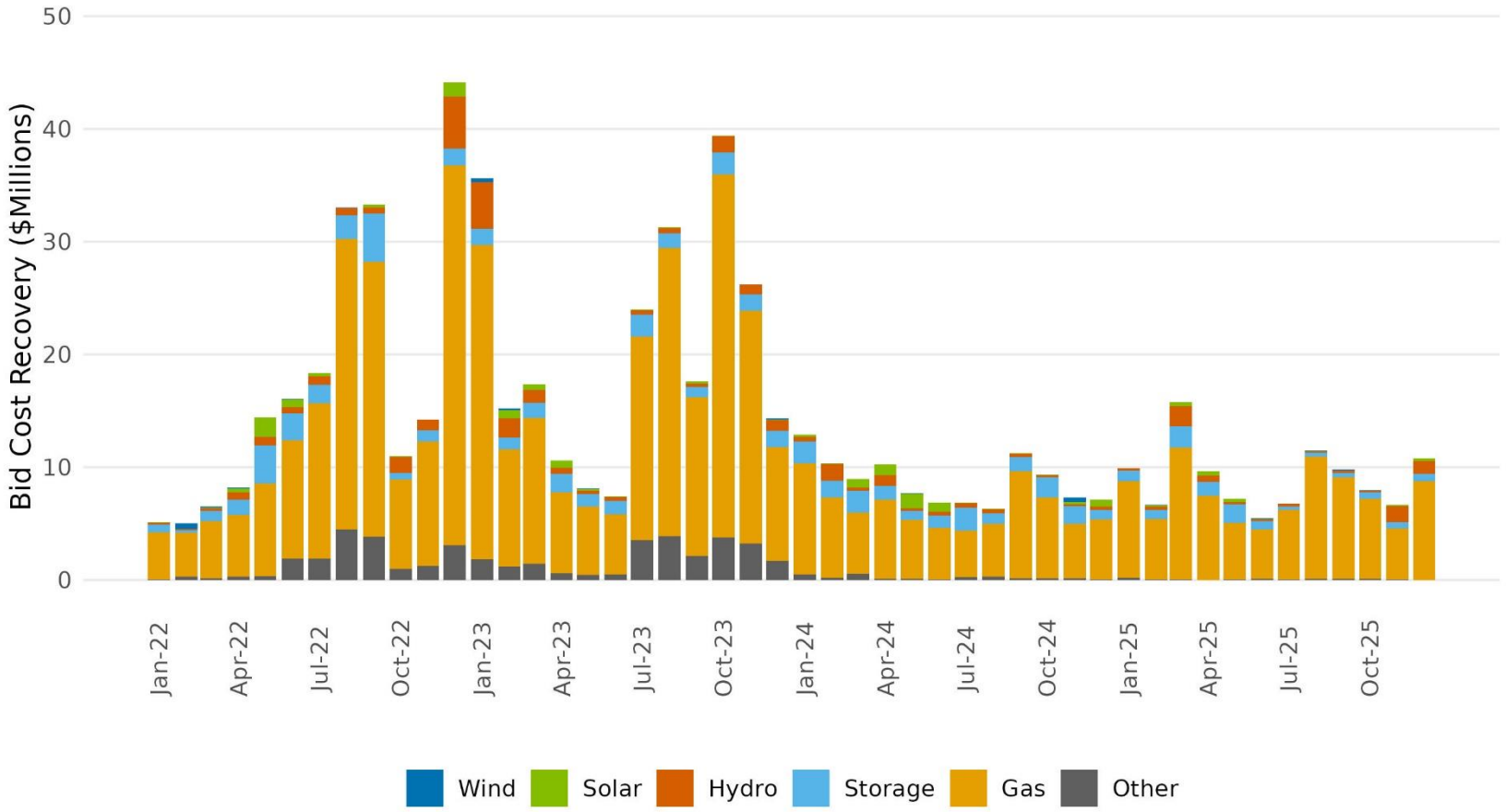
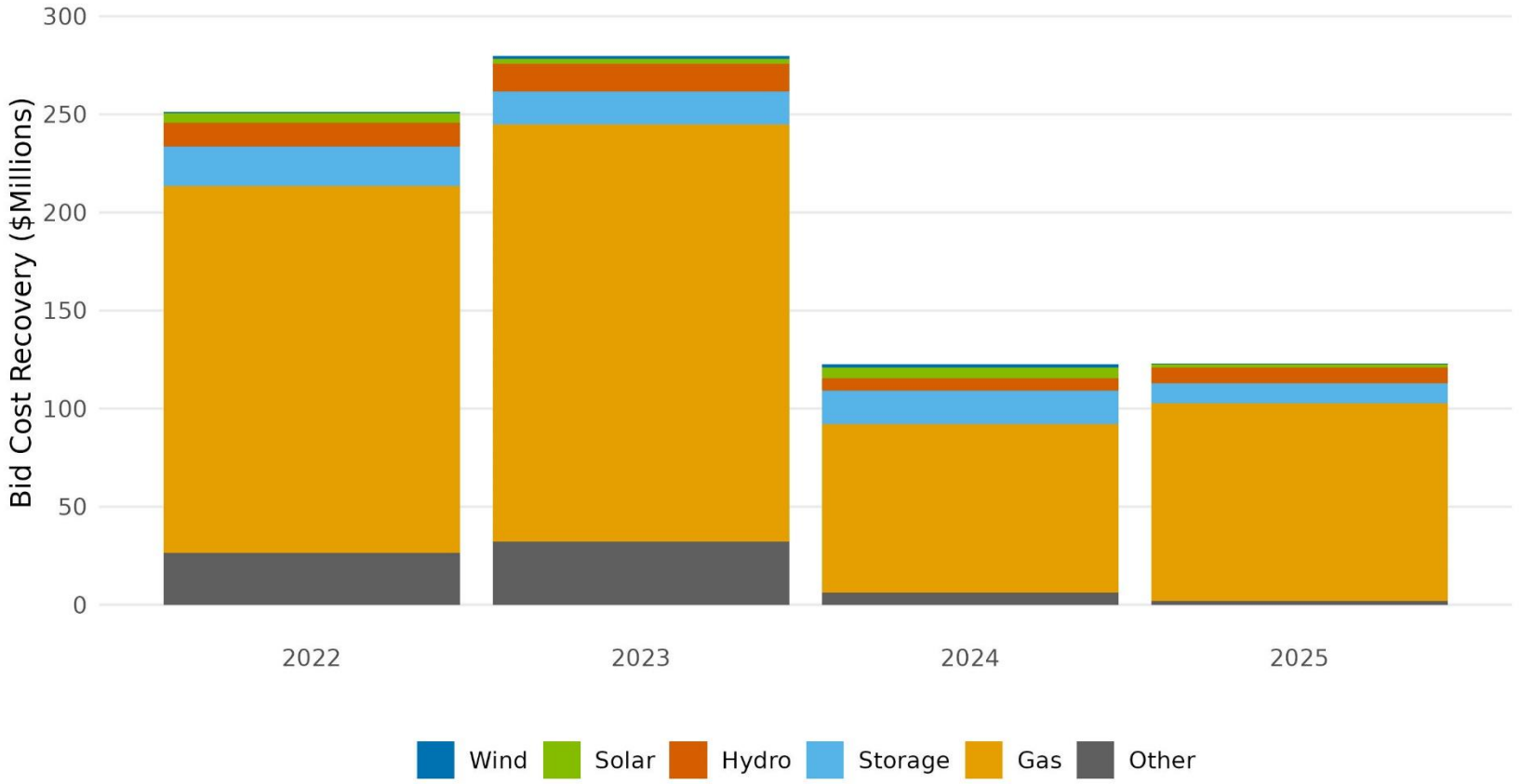


EIM bid cost recovery by fuel type – RTM

Gas and Storage resources make up 81.8% and 8.4% of EIM BCR respectively for 2025



EIM bid cost recovery by fuel type

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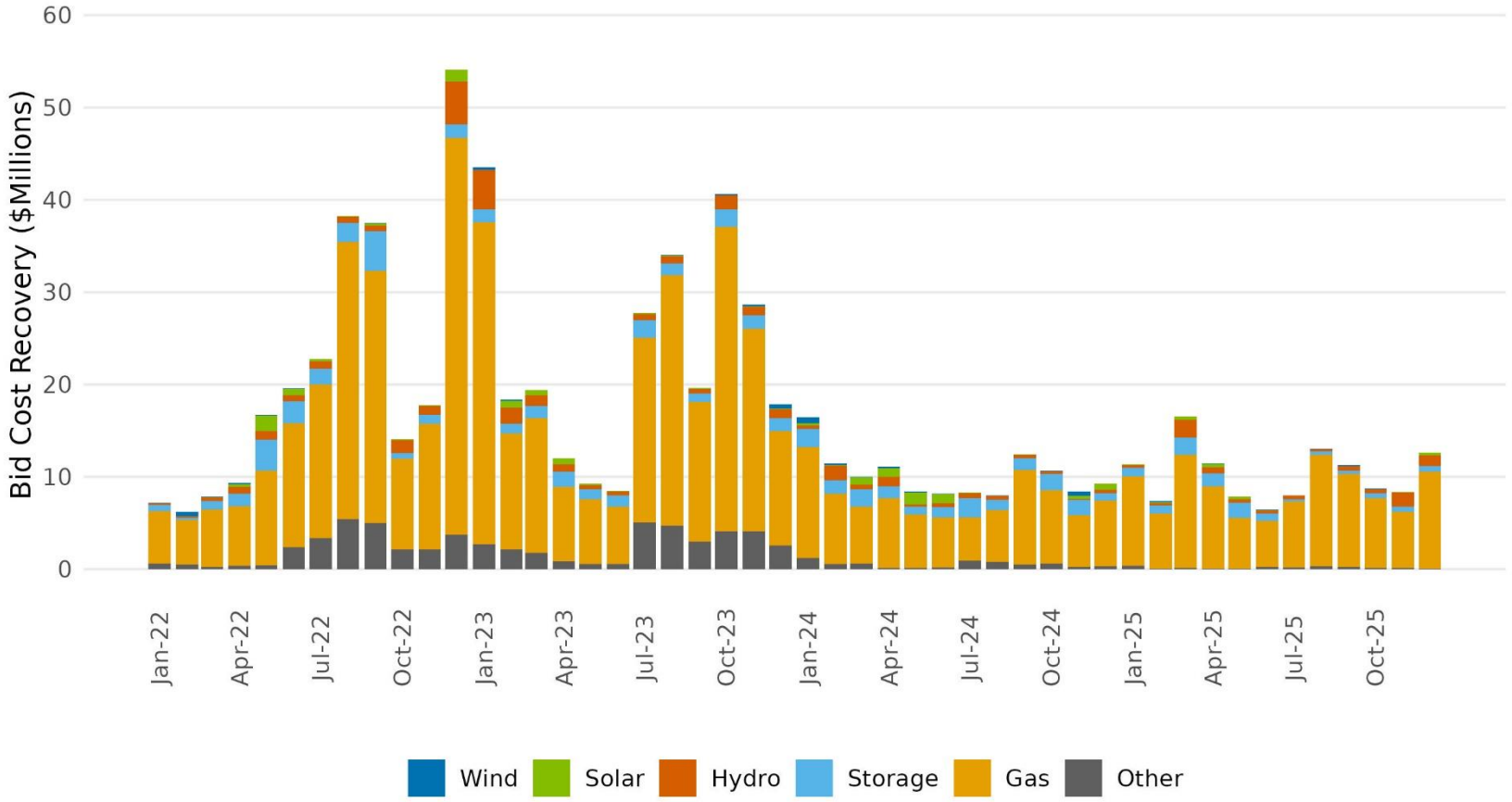
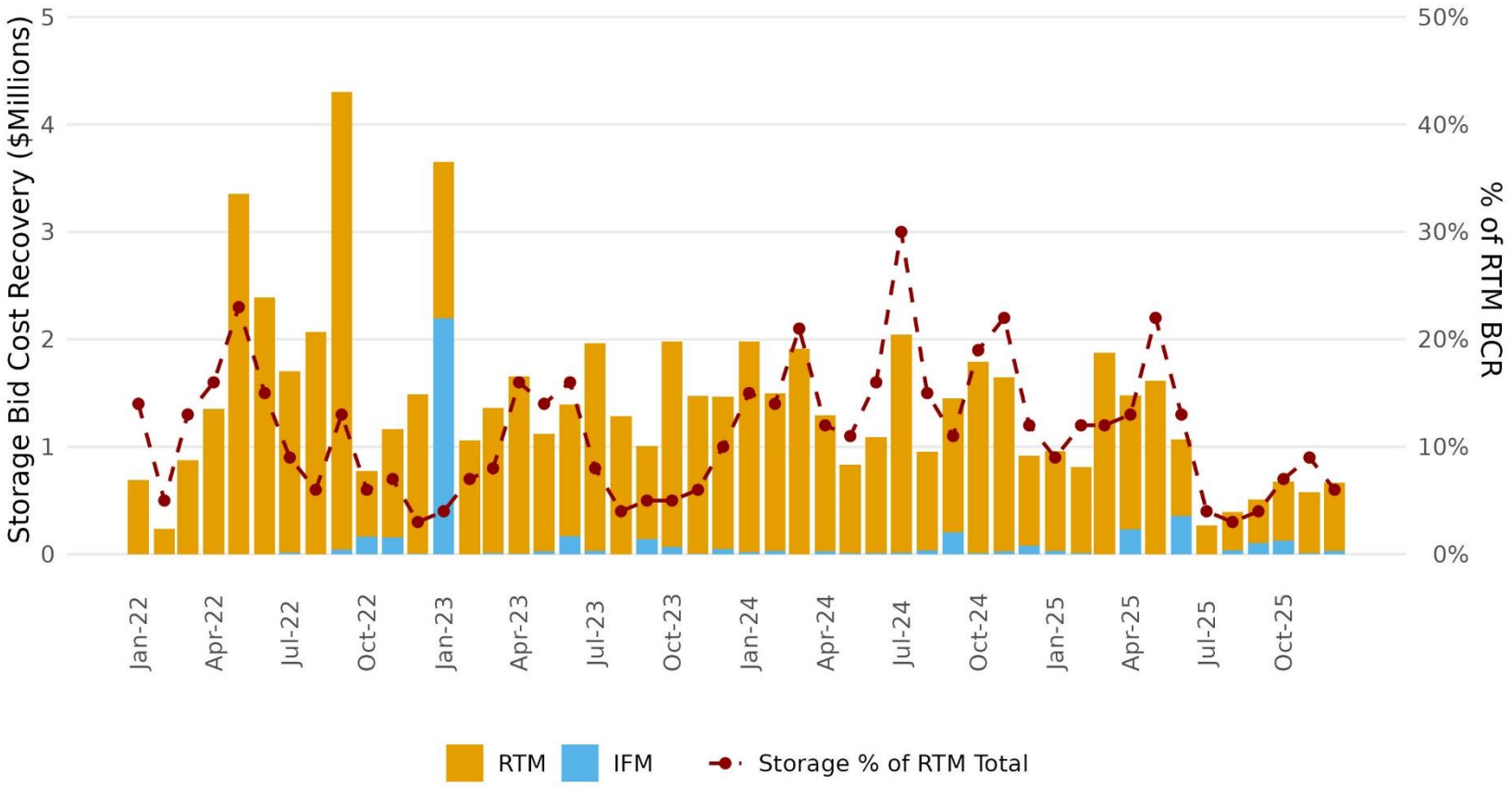


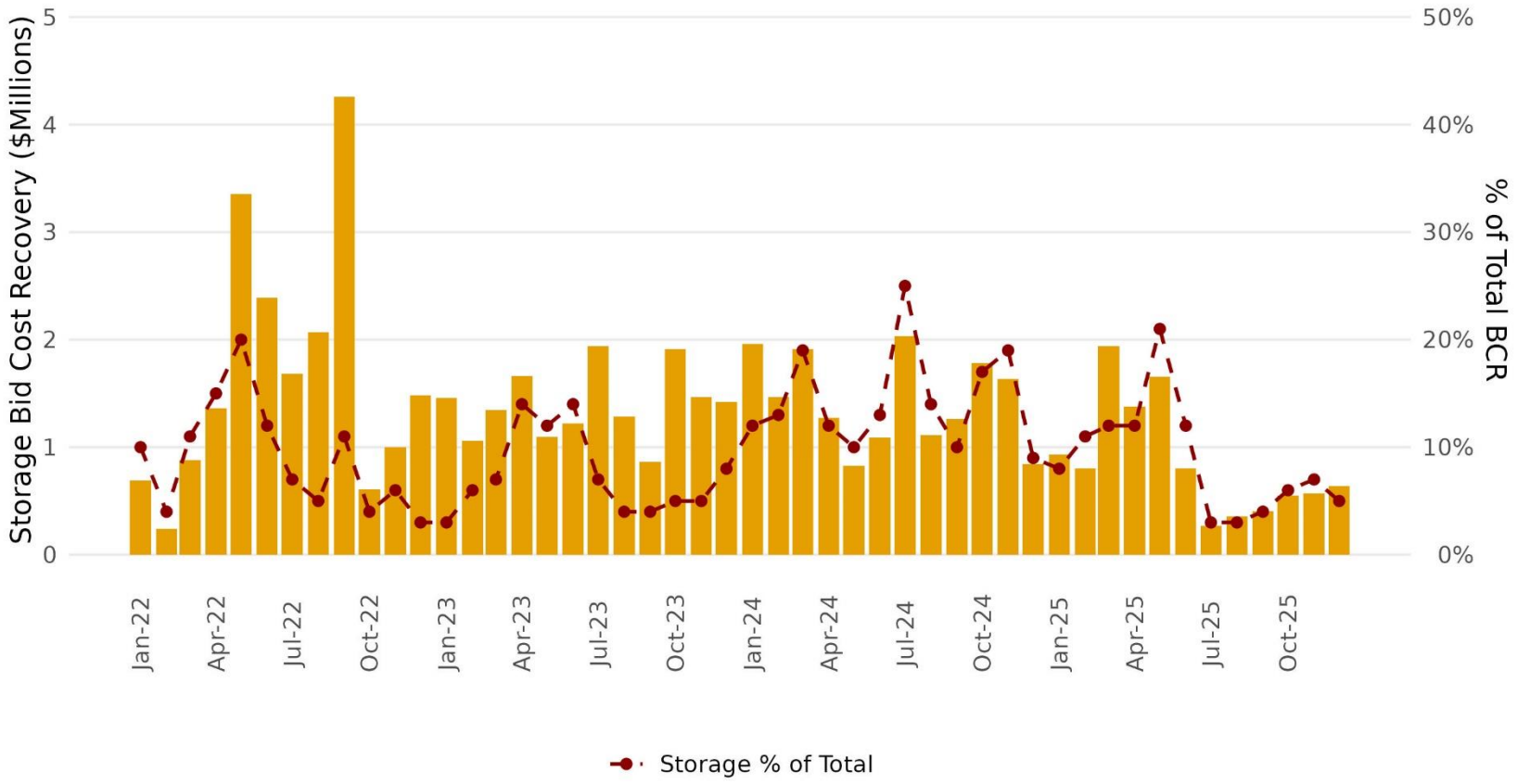
ISO bid cost recovery– storage resources

Storage resources make up 9.2% of RTM BCR for CISO in 2025



EIM bid cost recovery – storage resources

Storage resources make up 8.4% of RTM BCR across the entire EIM for 2025



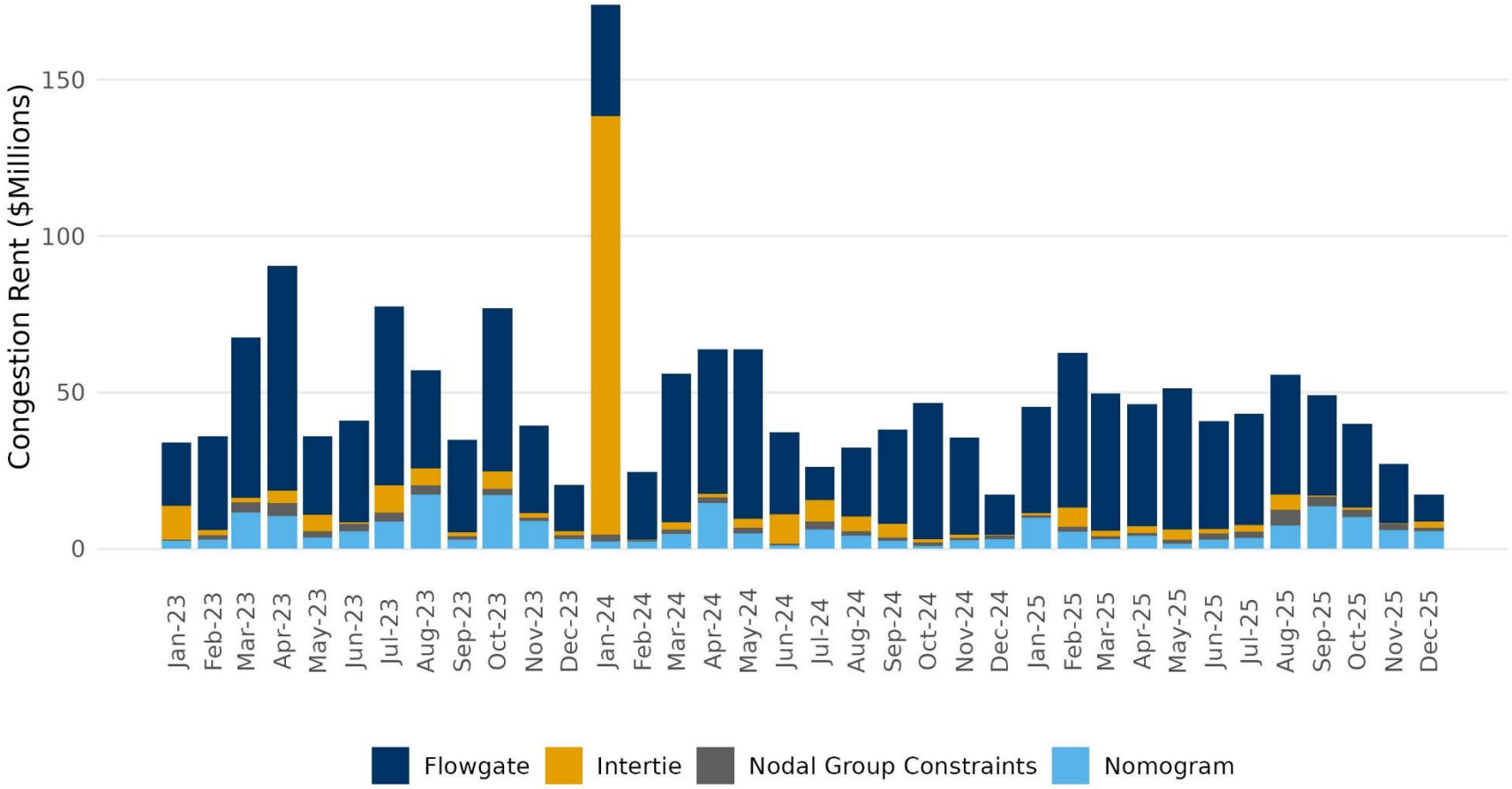
Congestion and Congestion revenue rights

Market Performance and Advanced Analytics

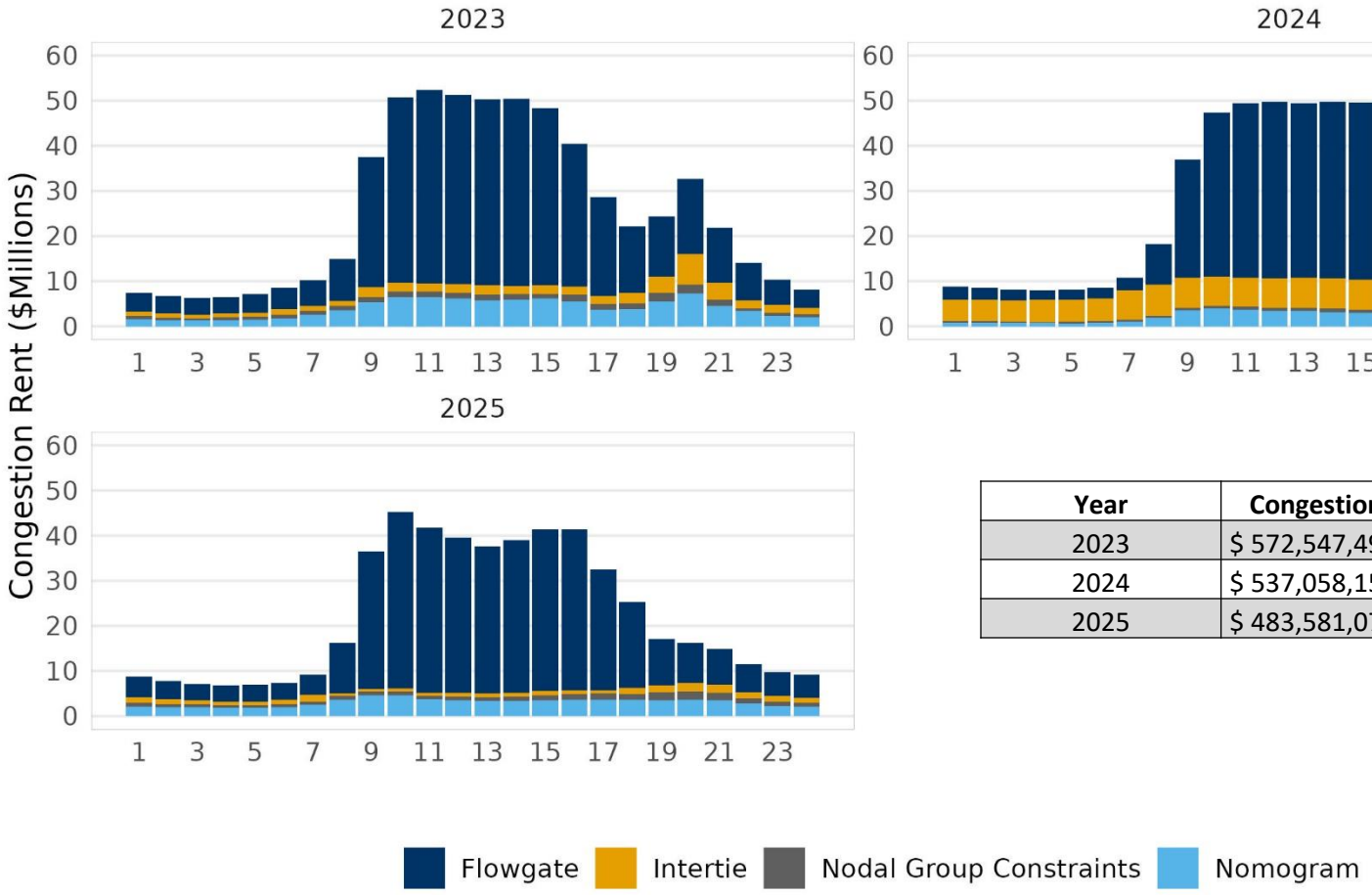
Congestion and CRRs

- Congestion in the day-ahead market reached minimal levels in Q4 2025
- Majority of congestion accrued during peak solar hours
- 2025 saw the lowest total of congestion rents since 2023
- Pro-rata funding for congestion revenue rights continues to provide surplus to load consistently

Congestion rents are lower through Q4 and in-line with previous years

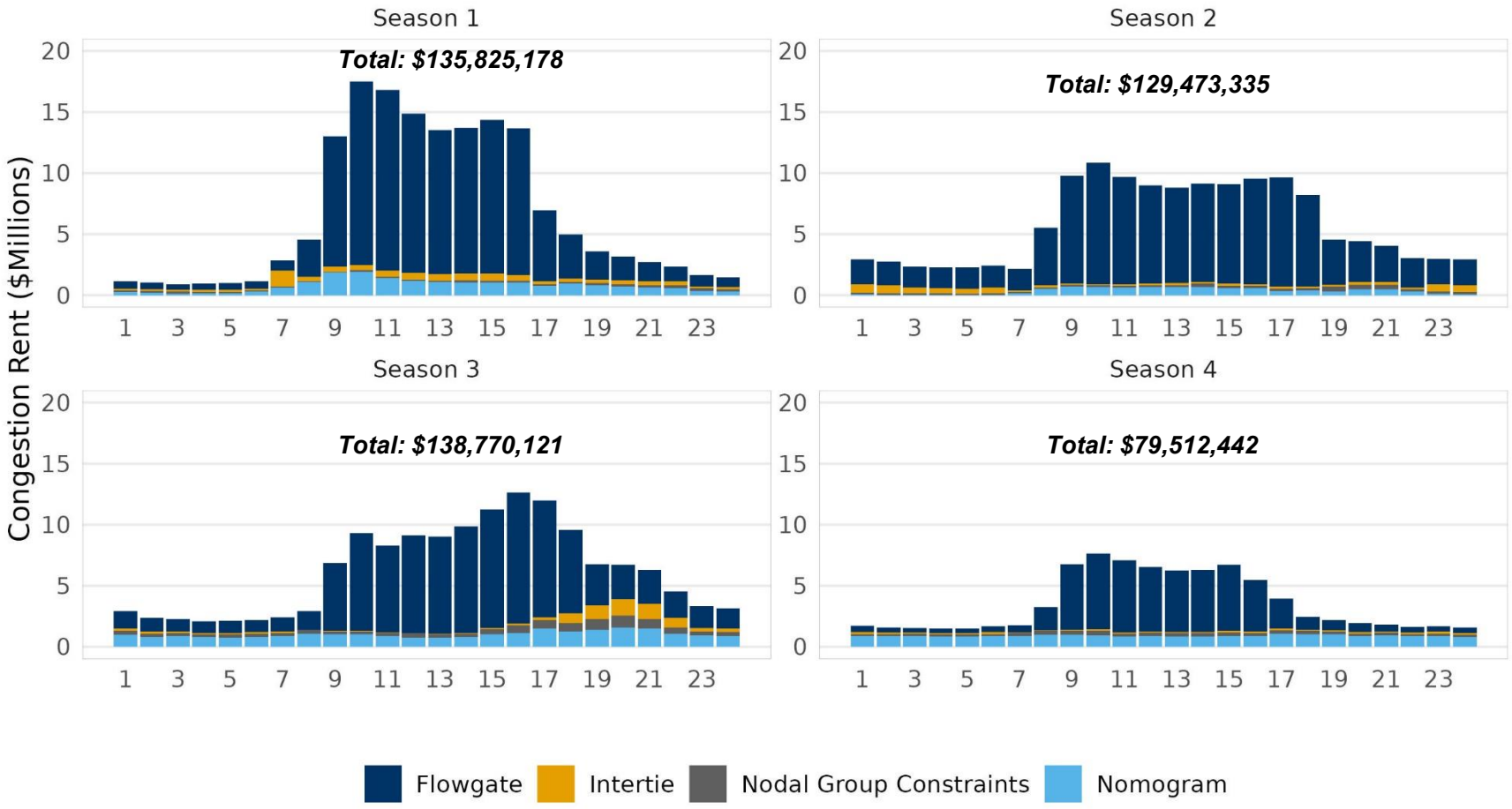


Congestion rents overall are lower in 2025 in comparison to past years

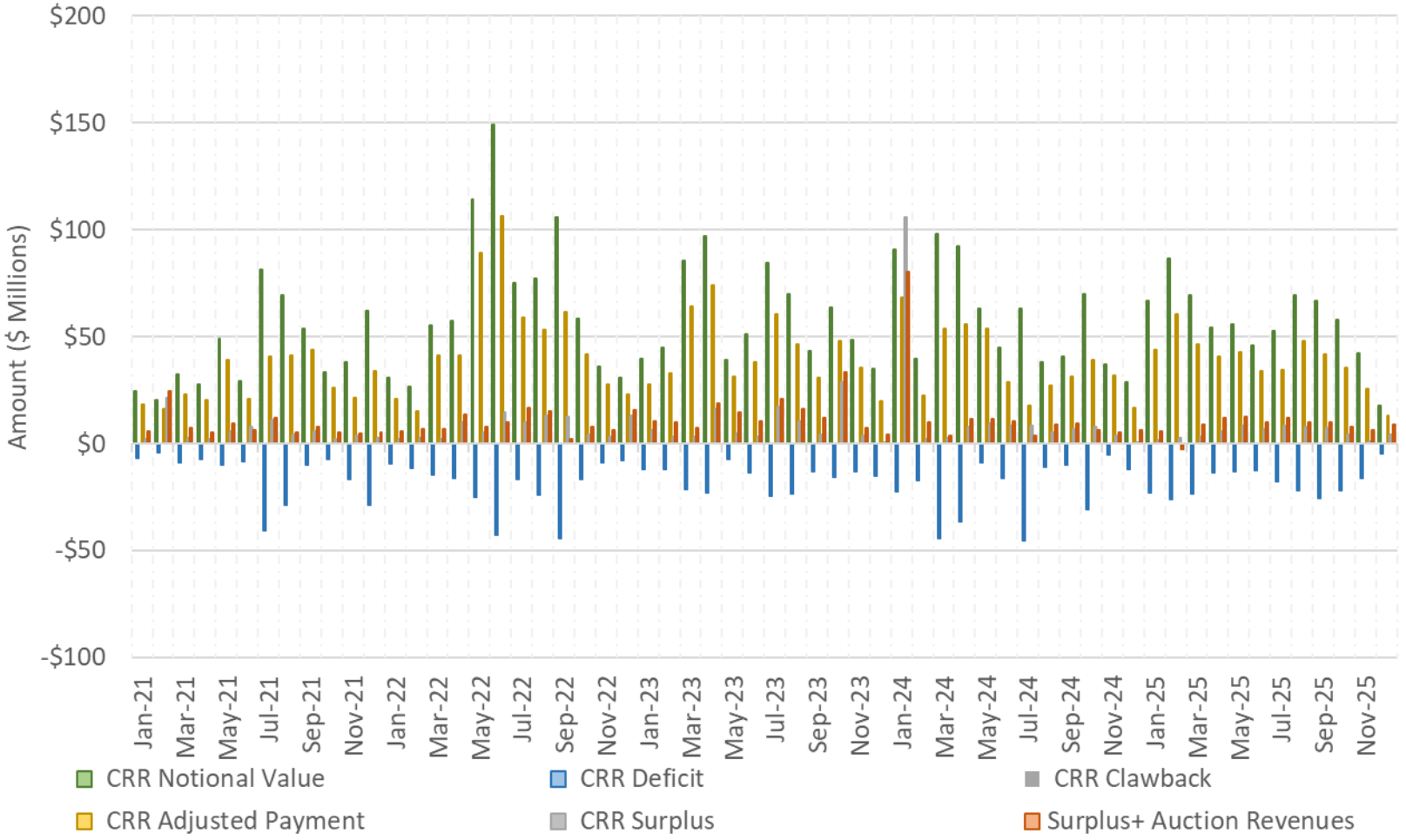


Year	Congestion Rent ($)
2023	$ 572,547,491
2024	$ 537,058,156
2025	$ 483,581,076

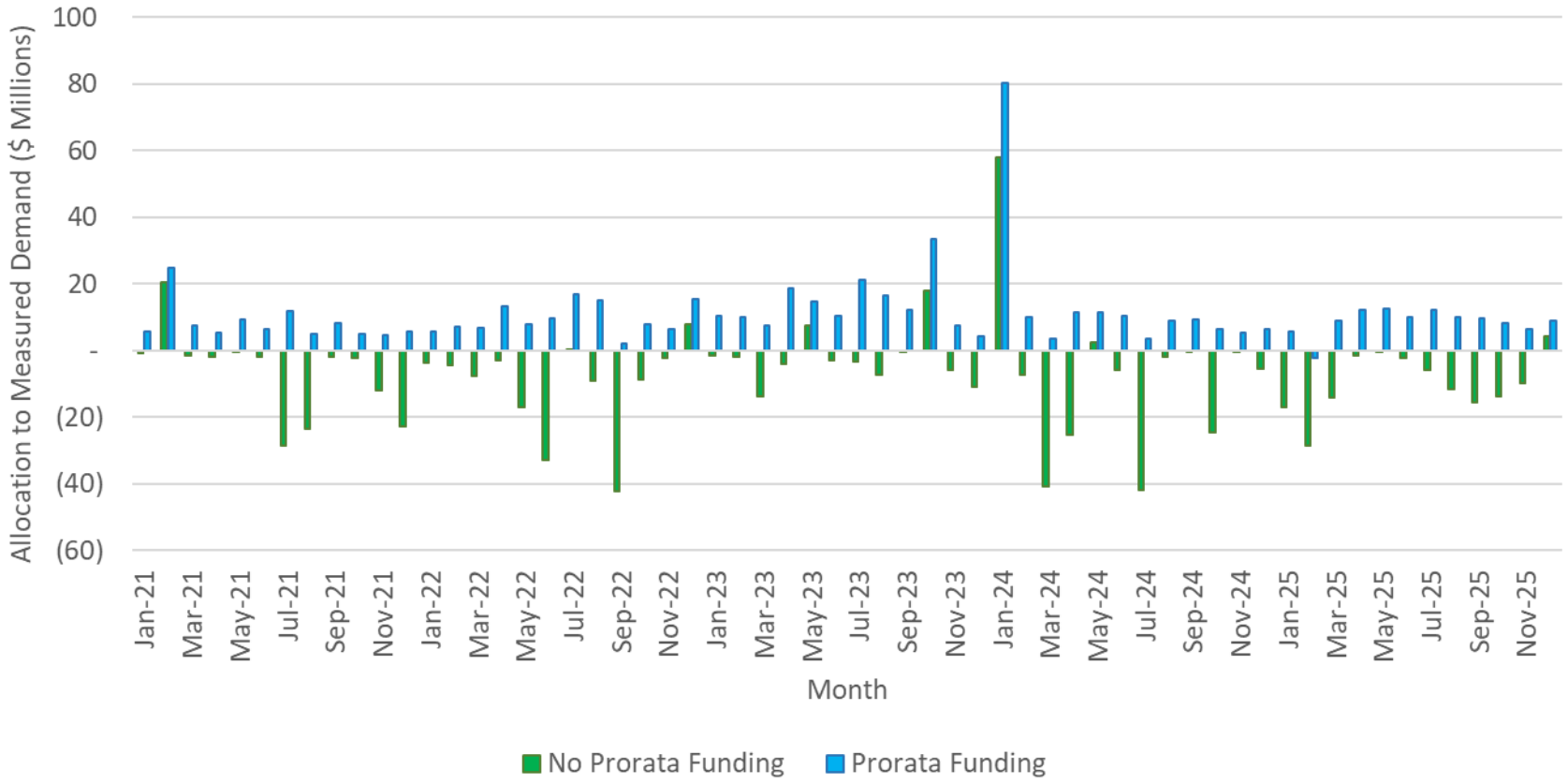
Season 4 saw the lowest congestion rents, totaling just over $79M



The percentage of haircuts on notional value was 32% across 2025



Pro-rata funding continues to provide surplus to load consistently



Gas and Power index prices, and market costs

Market Performance and Advanced Analytics

Gas and Power index prices, and market costs

Summary: Due to a calm post-summer and limited gas price volatility, prices in the CAISO BAA and WEIM were stable throughout the end of the year. As a result, total wholesale electricity costs in 2025 were lower than prior years

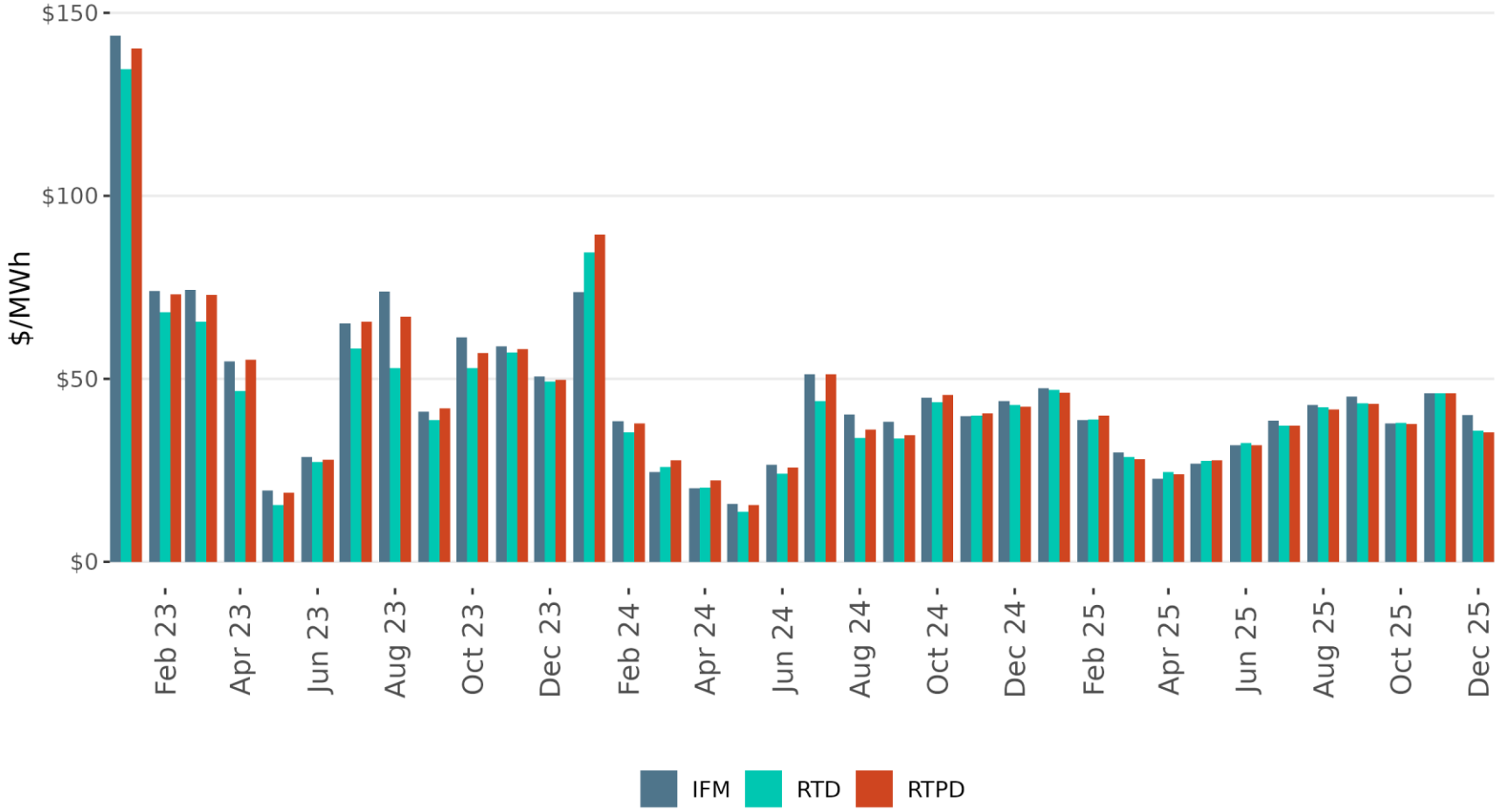
2025: $8.46 billion

2024: $9.15 billion

2023: $14.5 billion

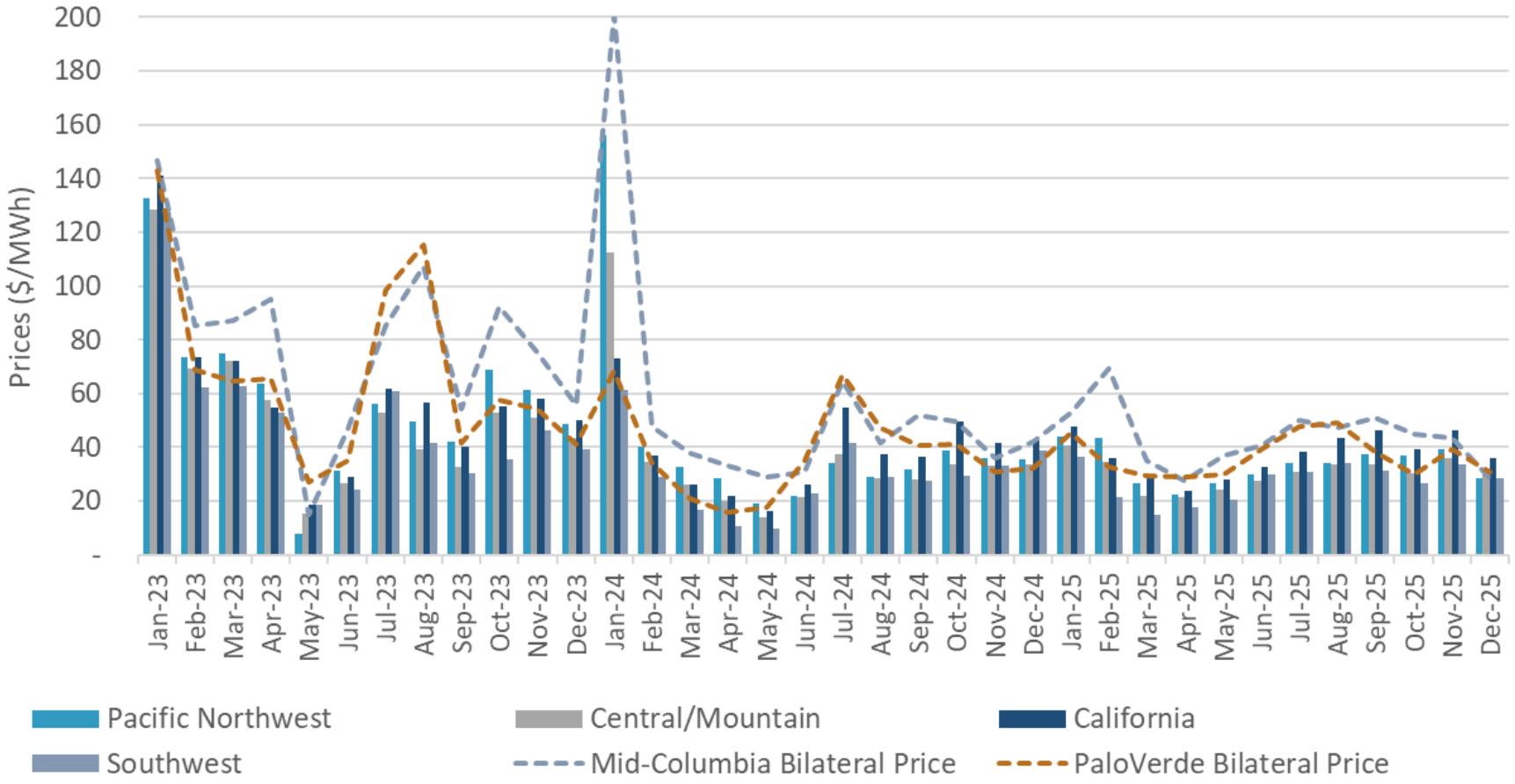
Next Steps: ISO staff continuously monitor Western bilateral markets and forward prices and provide updates on their impact to CAISO markets to stakeholders

Prices remain stable across markets and below $50 through Q4 of 2025

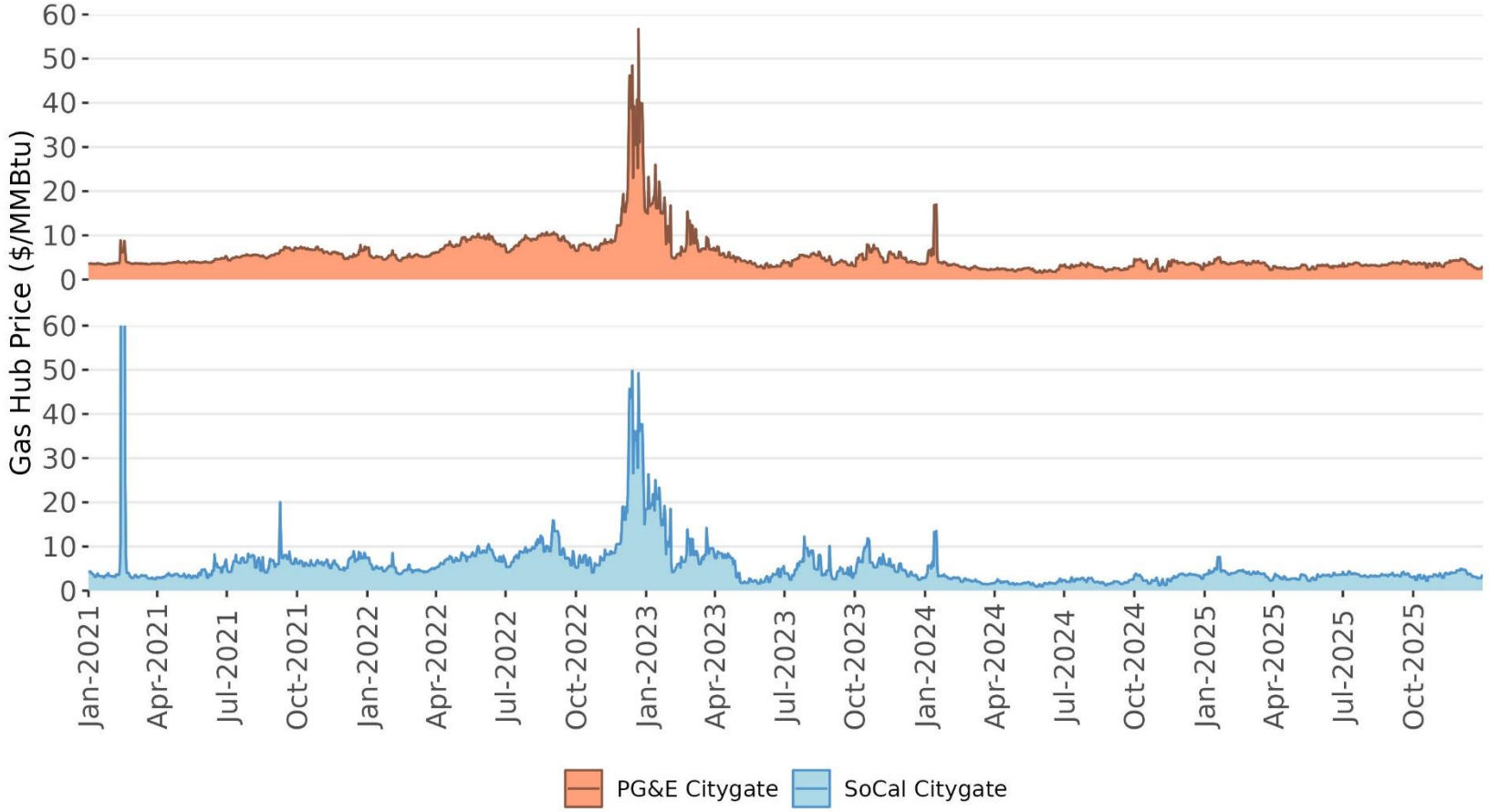


Note: Metric Based on System Marginal Energy Component (SMEC)

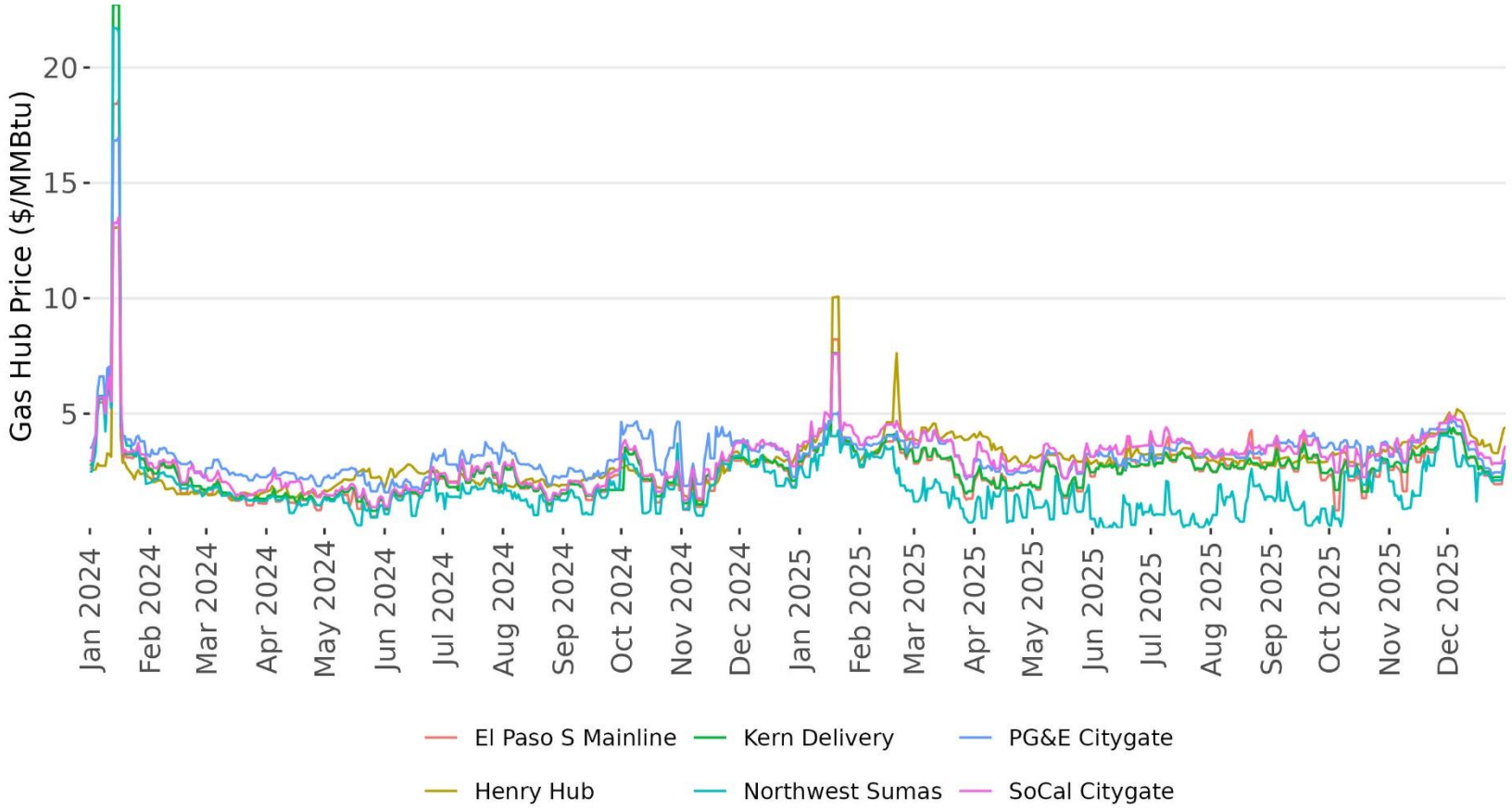
Real-time prices in the western energy imbalance market remain stable



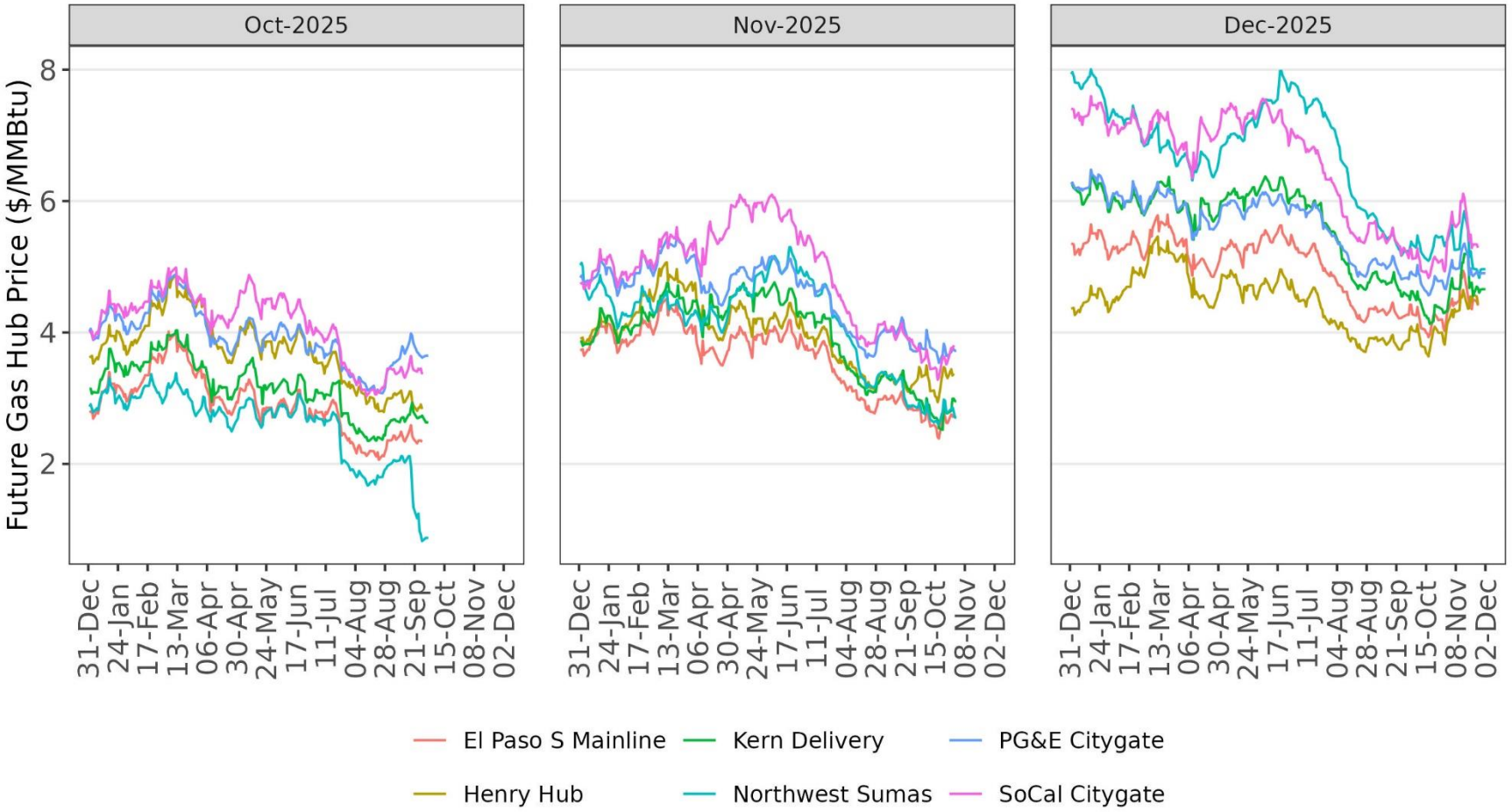
California next-day gas prices were slightly higher compared to 2024 but relatively stable compared to 2021-2023



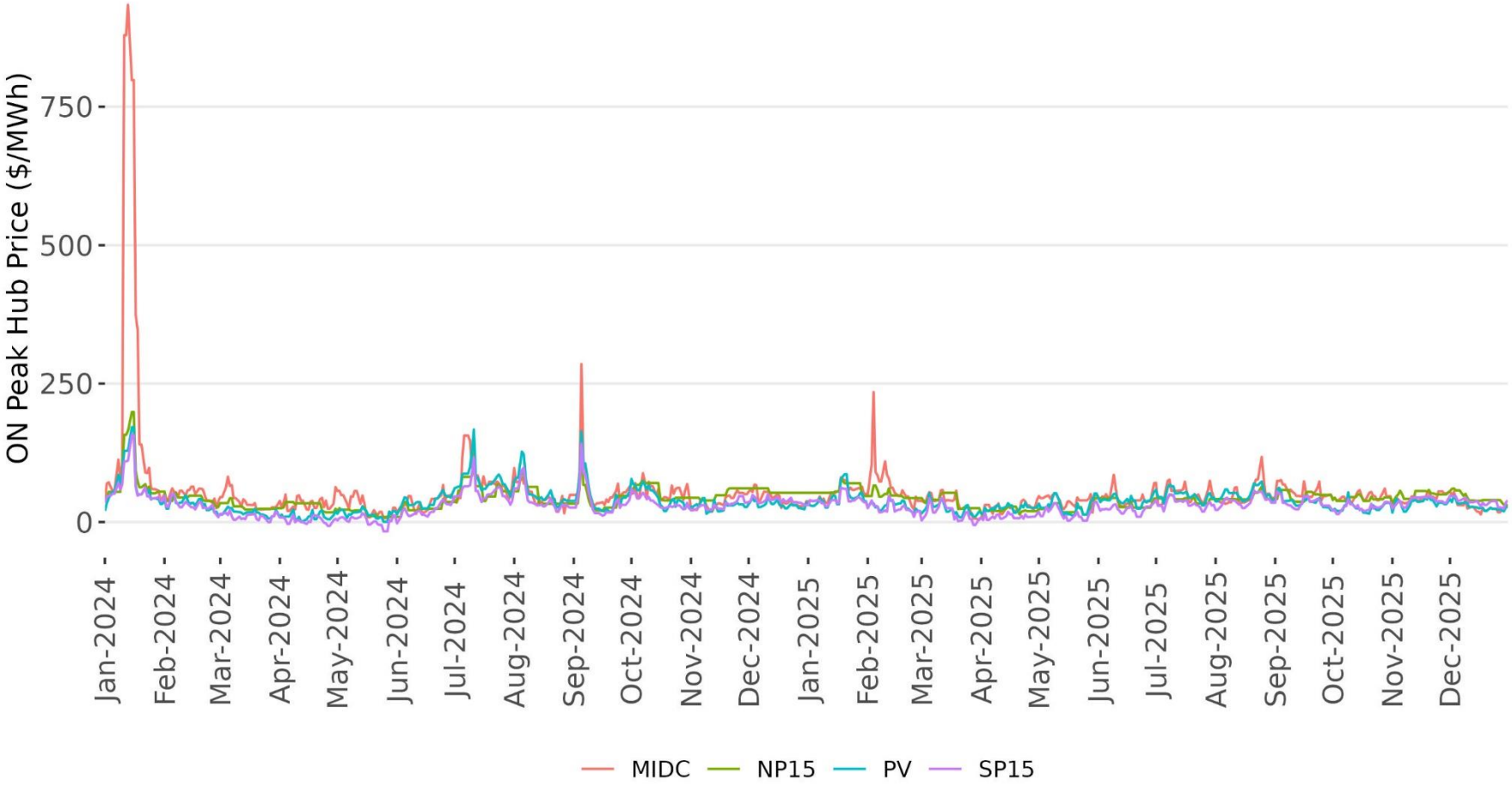
Western next-day gas prices for major hubs returned to closely following each other in October after NW Sumas deviated over the summer months



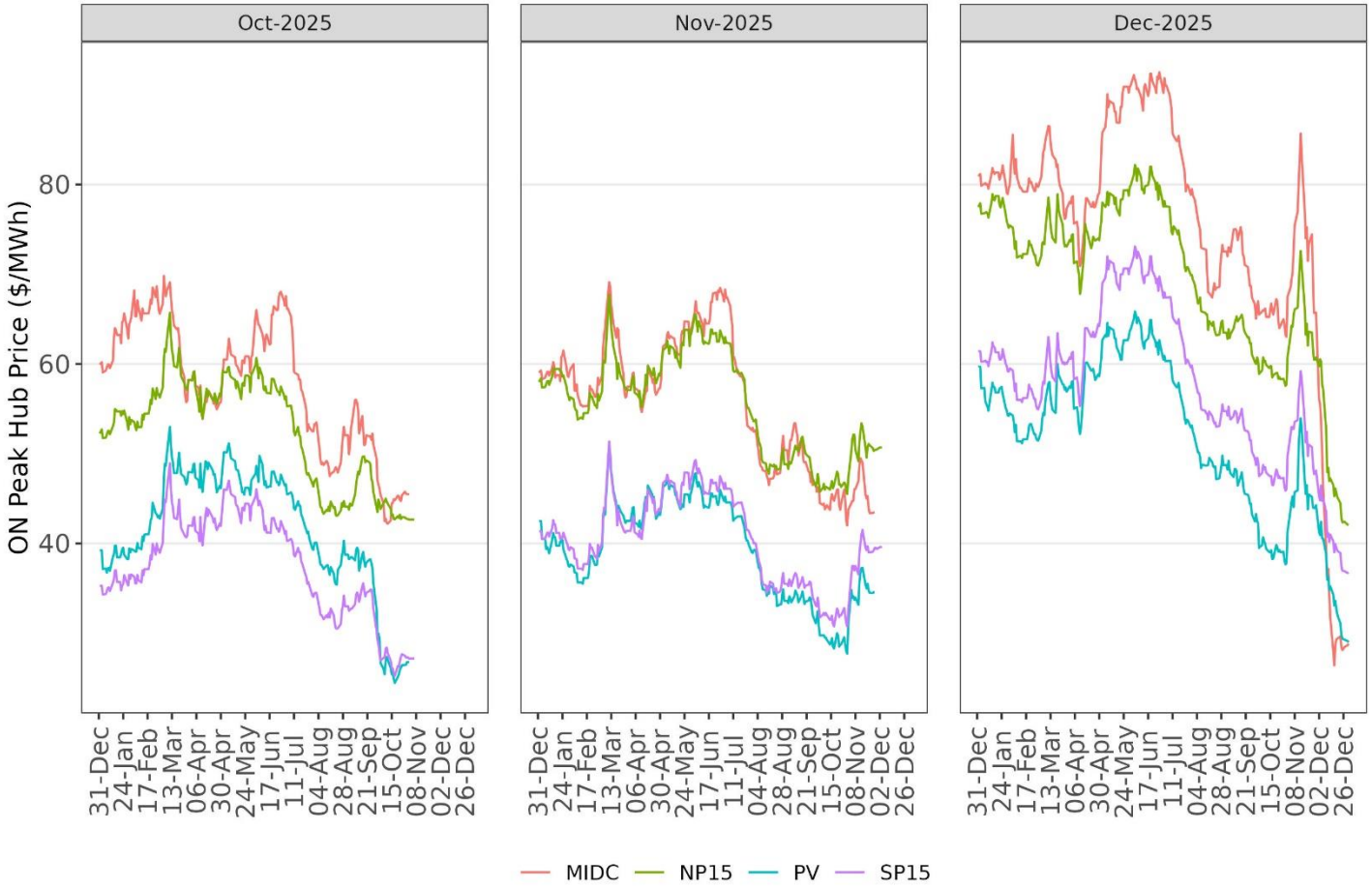
Future gas prices for October to December 2025 started declining in July and then rose slightly in late summer. December prices continued rising



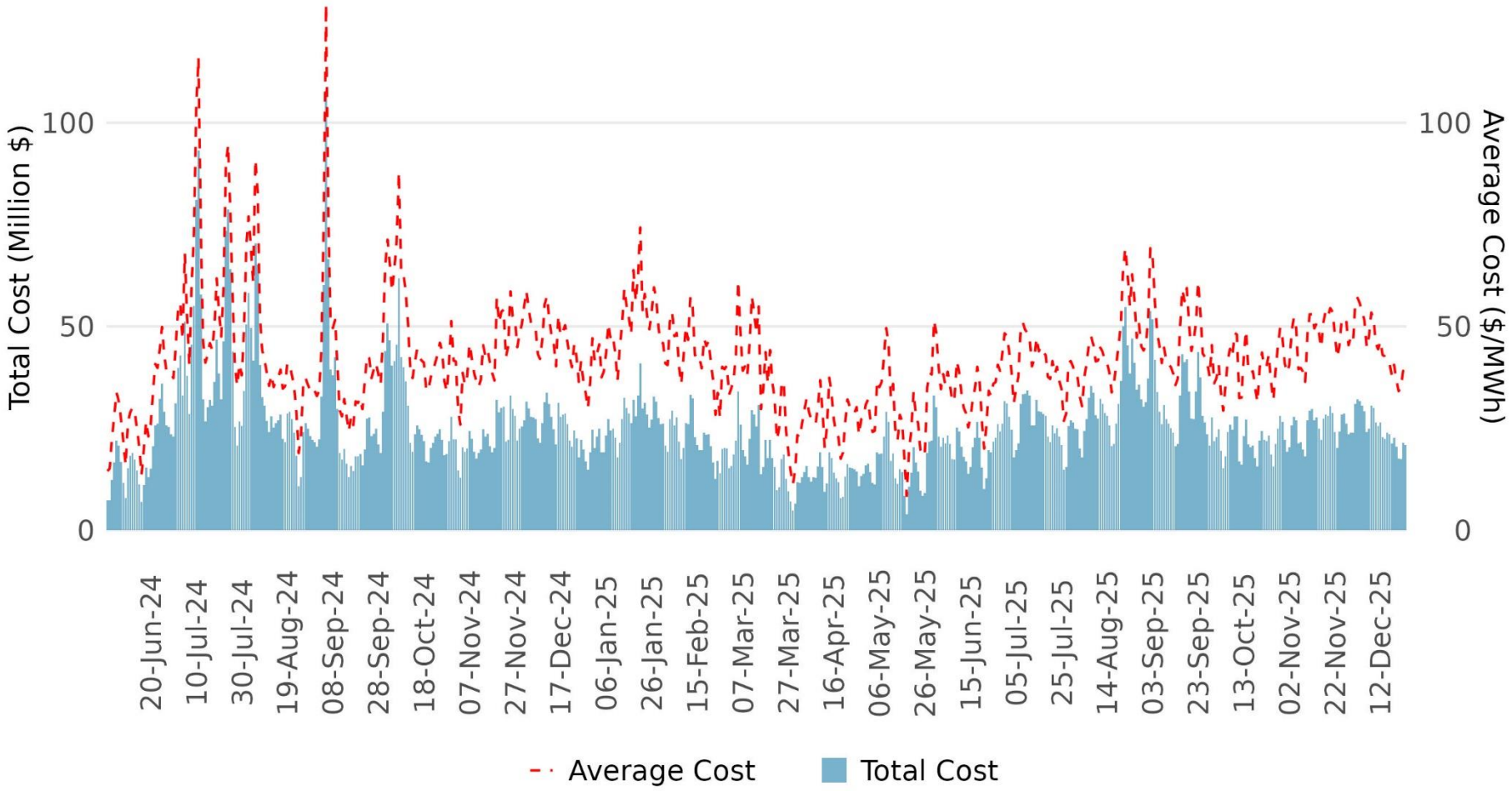
Next-day on-peak bilateral power prices remained below $85/MWh for September through December



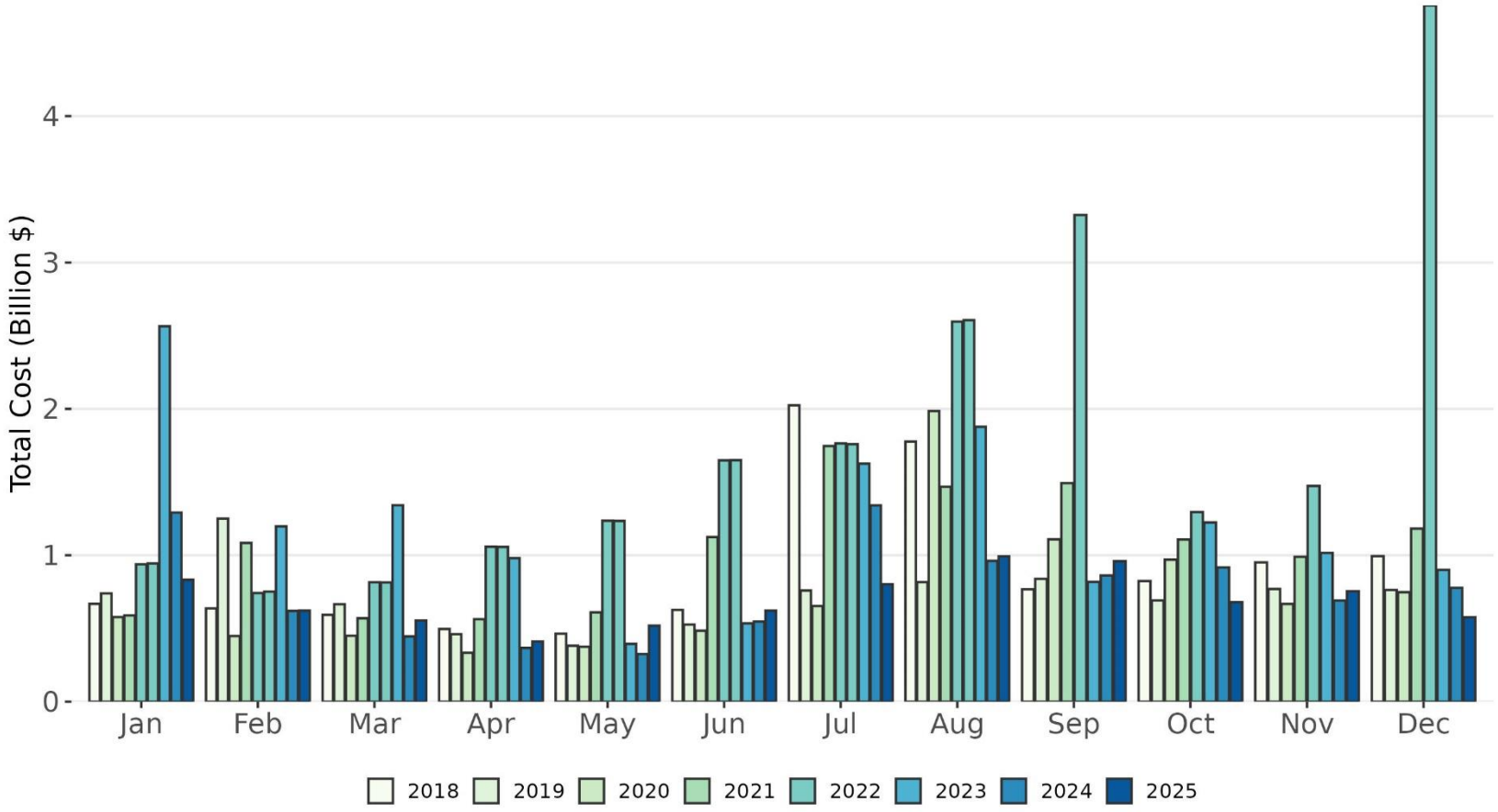
Future on-peak power prices for delivery in October, November, and December showed price separation between Mid Columbia and Palo Verde.



Daily market costs reached the highest level in 2025 on January 21

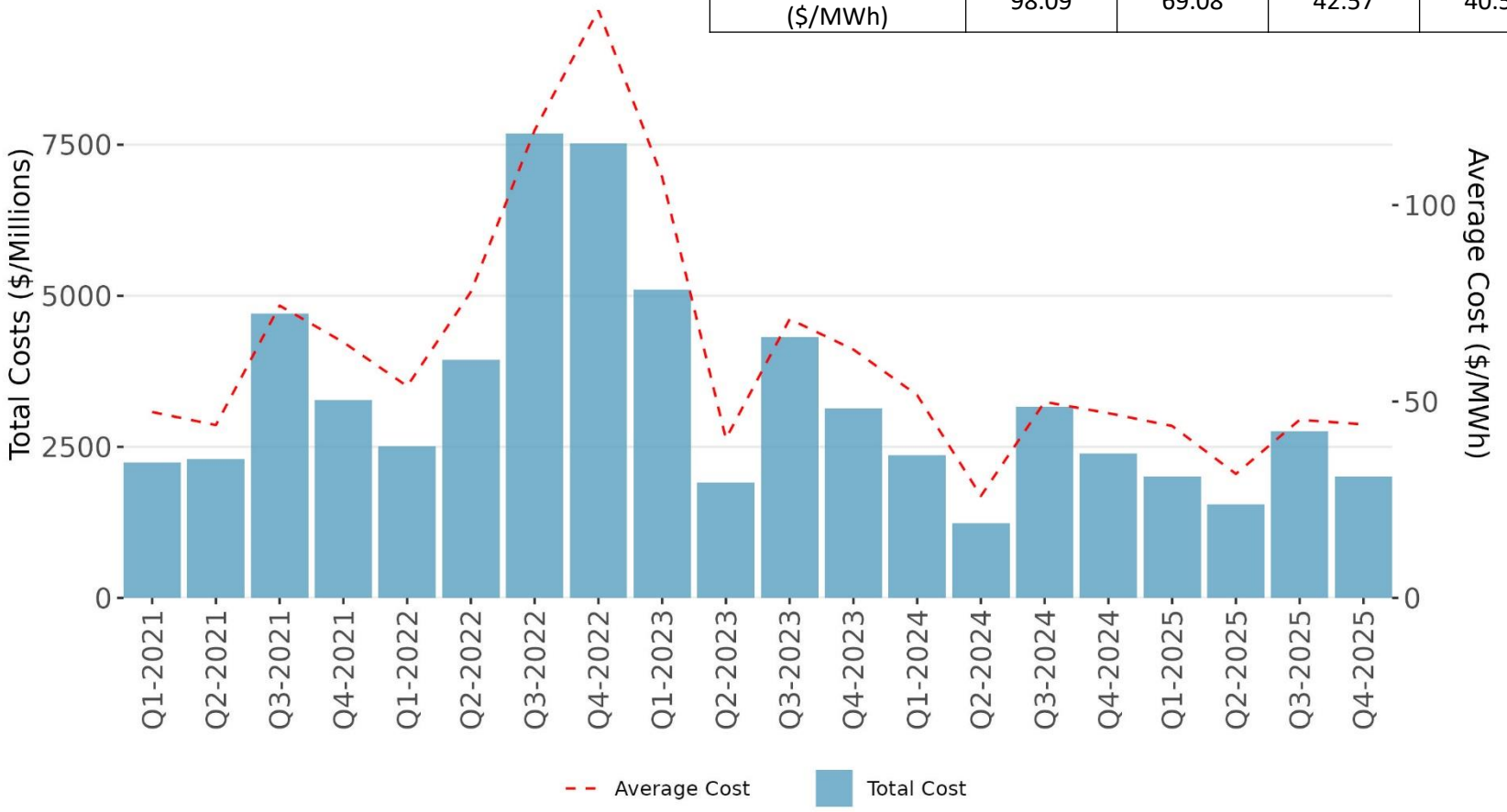


Monthly totals for October and December 2025 were lower than previous year, but higher for November



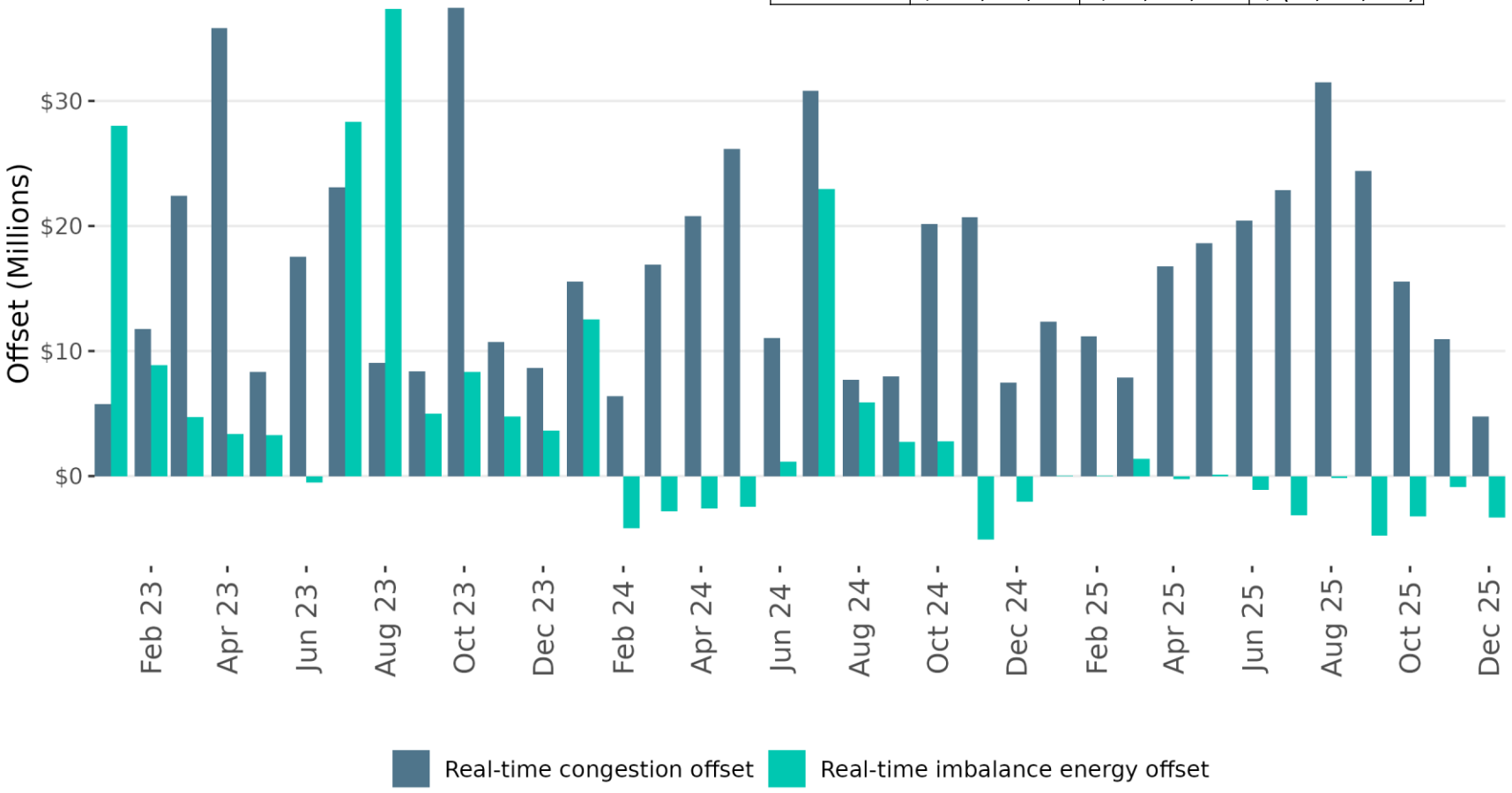
Except for Q2, 2025 total costs were lower than 2024 total costs

Costs	2022	2023	2024	2025
Total Wholesale Electricity ($billions)	21.67	14.48	9.15	8.46
Average per MWh ($/MWh)	98.09	69.08	42.57	40.52



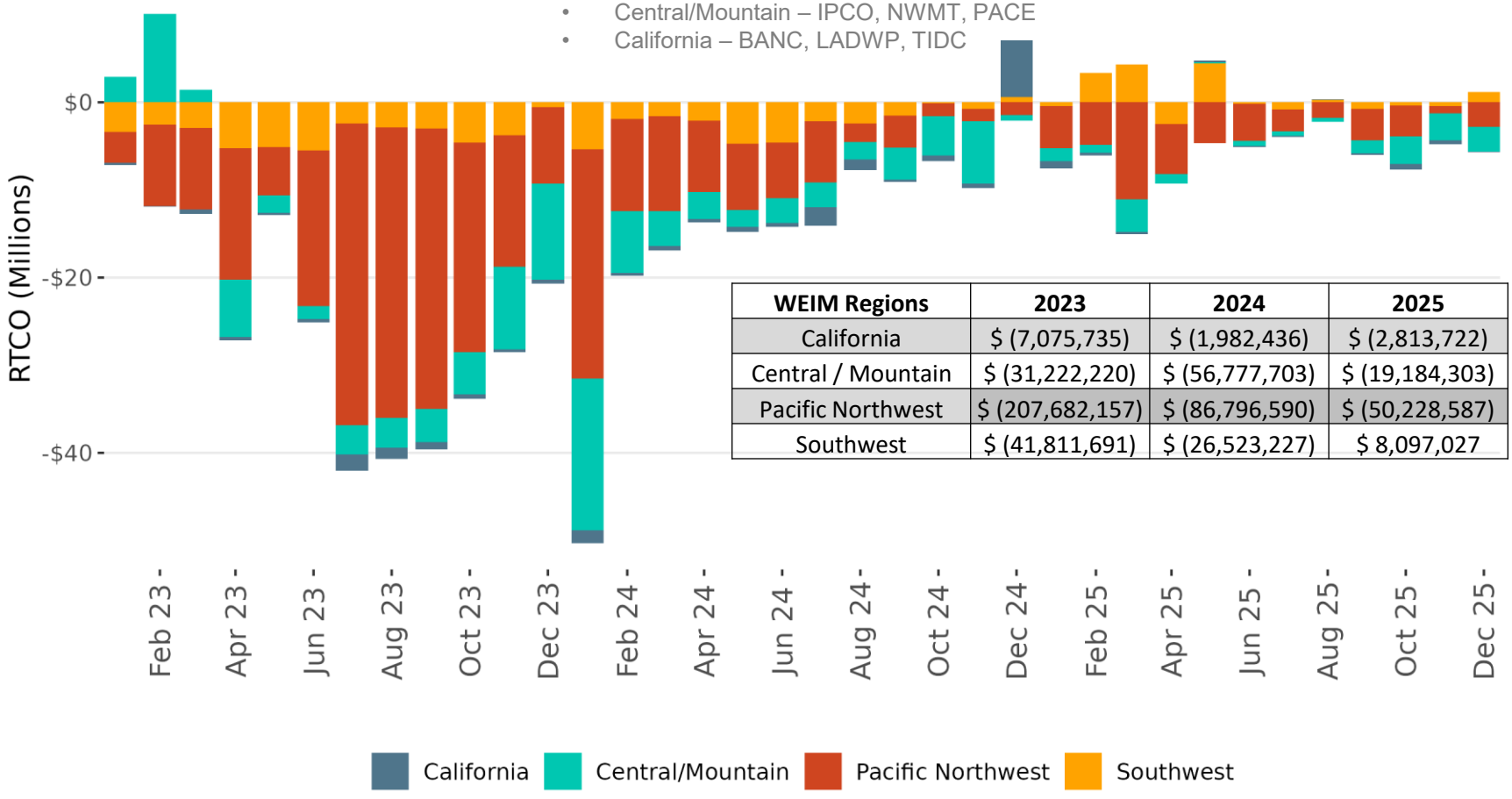
ISO area real-time congestion offset costs have decreased coming out of Summer

Costs	2023	2024	2025
RTCO	$ 198,950,051	$ 191,689,015	$ 197,228,761
RTIEO	$ 135,142,157	$ 28,920,357	$ (15,211,091)



Areas in the Pacific Northwest are allocated about 66 percent of the total net real-time congestion offset

- Southwest – AZPS, EPE, NEVP, PNM, SRP, TEPC, WALC
- Pacific Northwest – AVA, AVRN, BCHA, BPAT, PACW, PGE, PSEI, SCL, TPWR
- Central/Mountain – IPCO, NWMT, PACE
- California – BANC, LADWP, TIDC



WEIM Regions	2023	2024	2025
California	$ (7,075,735)	$ (1,982,436)	$ (2,813,722)
Central / Mountain	$ (31,222,220)	$ (56,777,703)	$ (19,184,303)
Pacific Northwest	$ (207,682,157)	$ (86,796,590)	$ (50,228,587)
Southwest	$ (41,811,691)	$ (26,523,227)	$ 8,097,027

Real time imbalance energy offset costs have been low since January 2024

- Southwest – AZPS, EPE, NEVP, PNM, SRP, TEPC, WALC
- Pacific Northwest – AVA, AVRN, BCHA, BPAT, PACW, PGE, PSEI, SCL, TPWR
- Central/Mountain – IPCO, NWMT, PACE
- California – BANC, LADWP, TIDC

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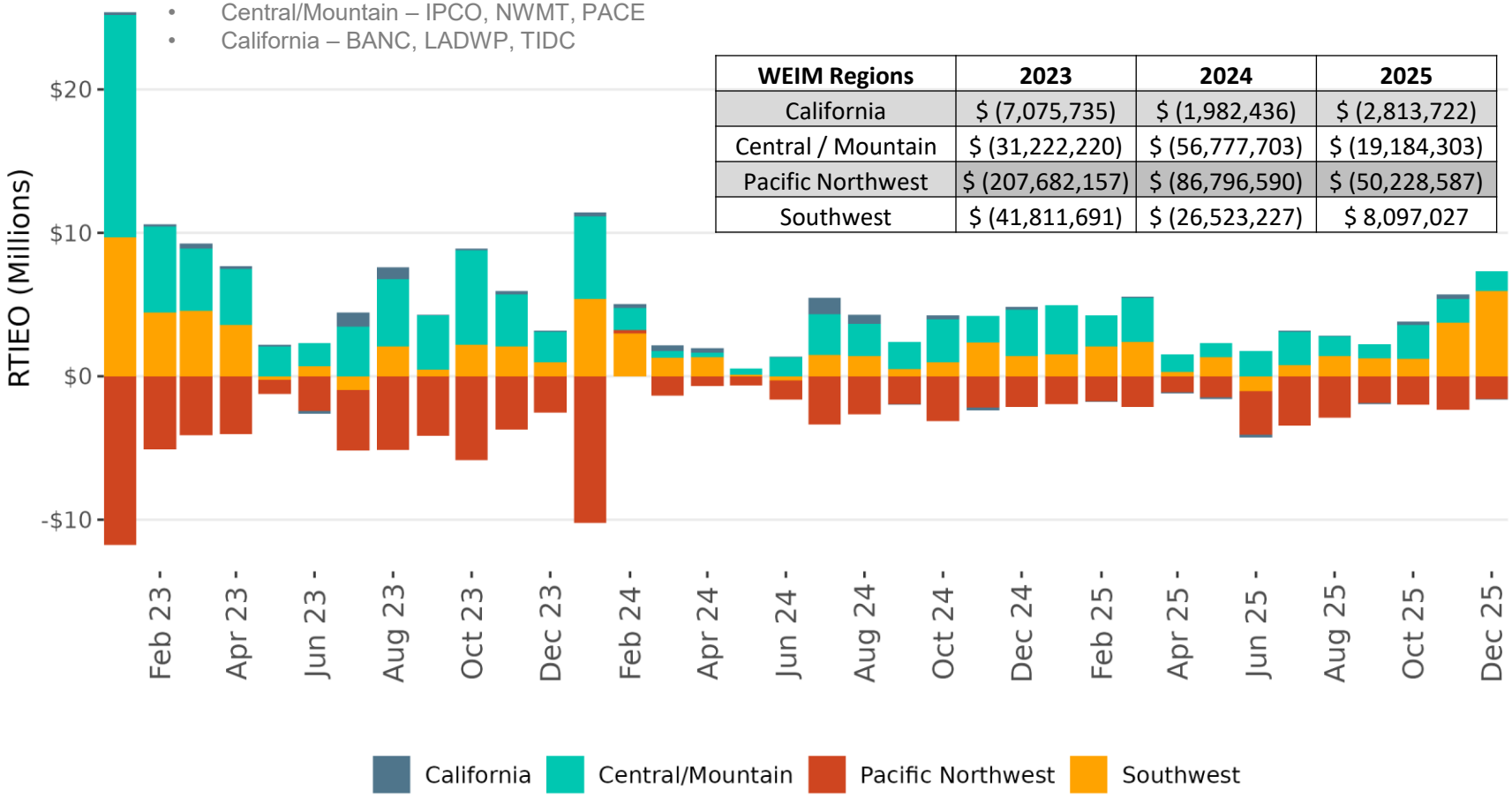
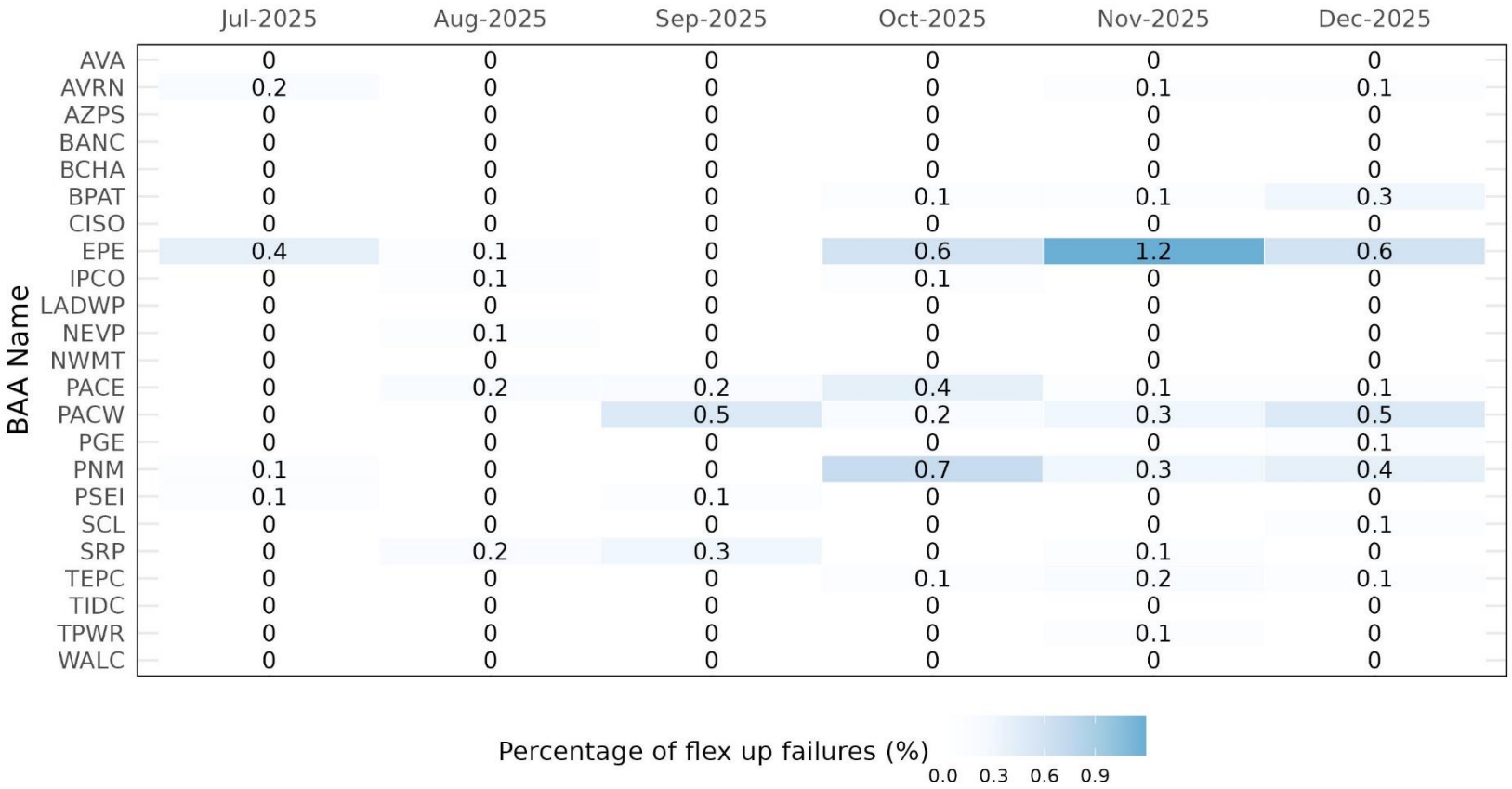


* Does not include CAISO

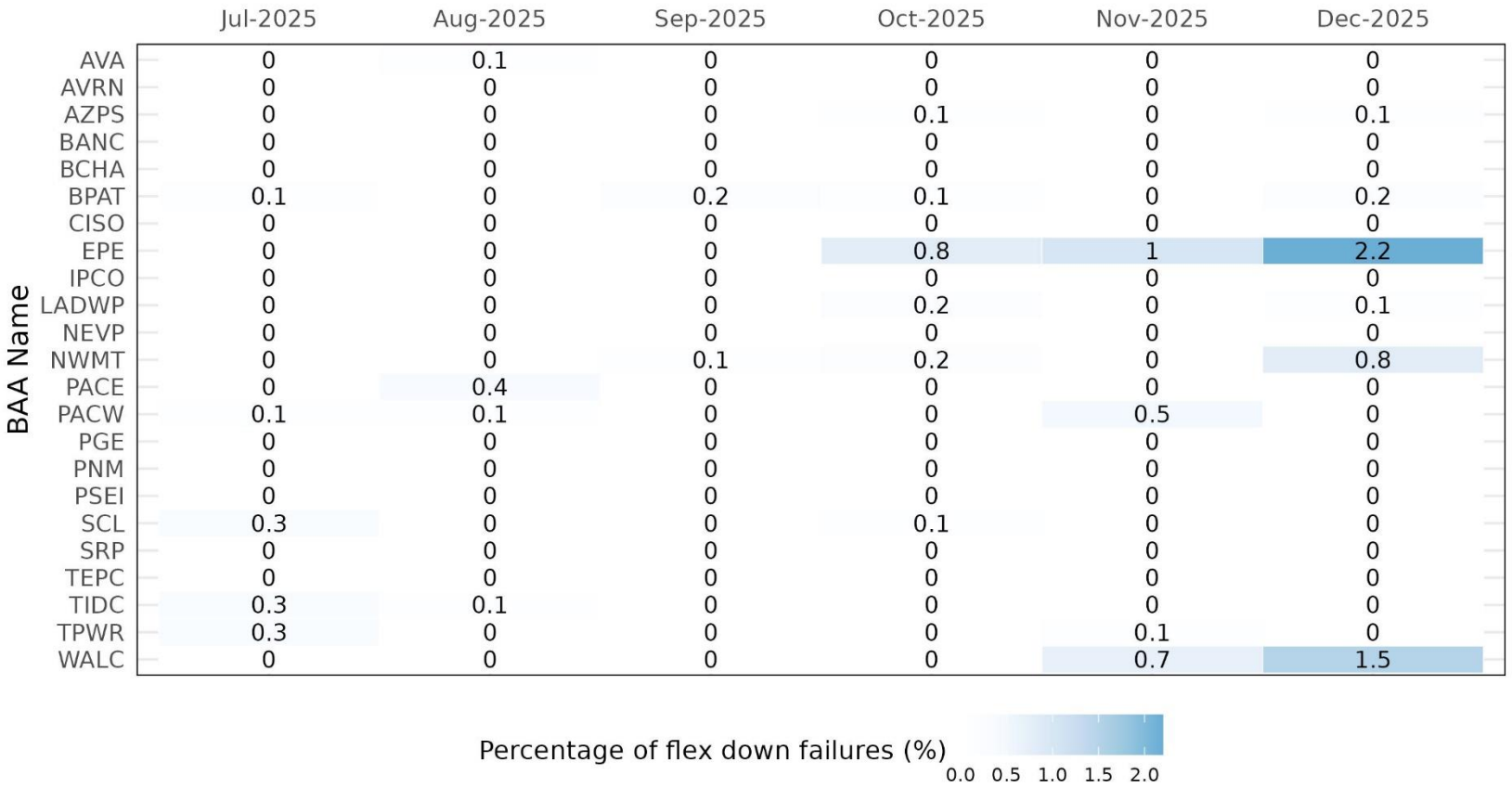
WEIM Resource Sufficiency evaluation performance

Market Performance and Advanced Analytics

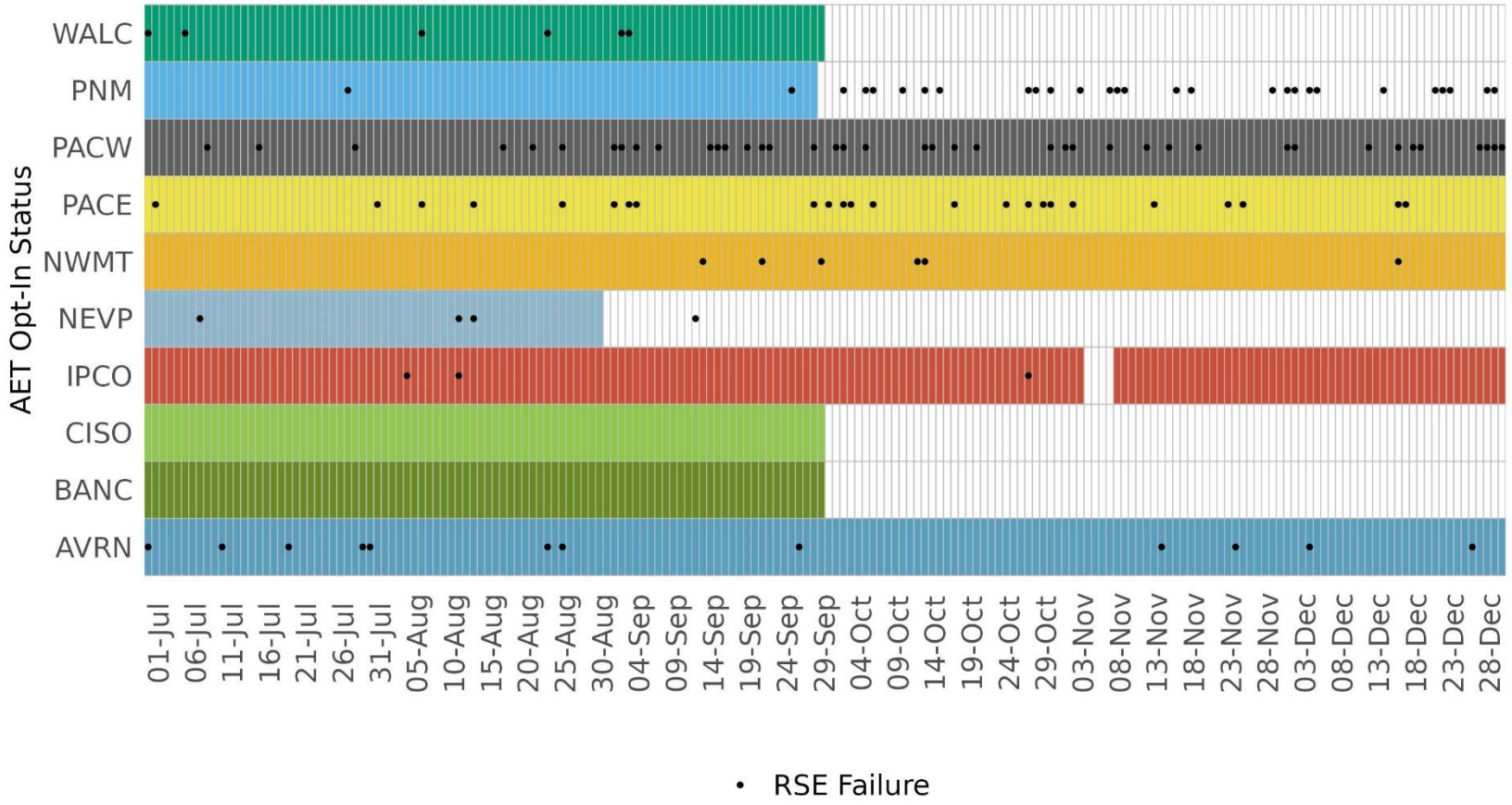
Flexible ramp up failures for the last 6 months are low, with the highest value at 1.2%



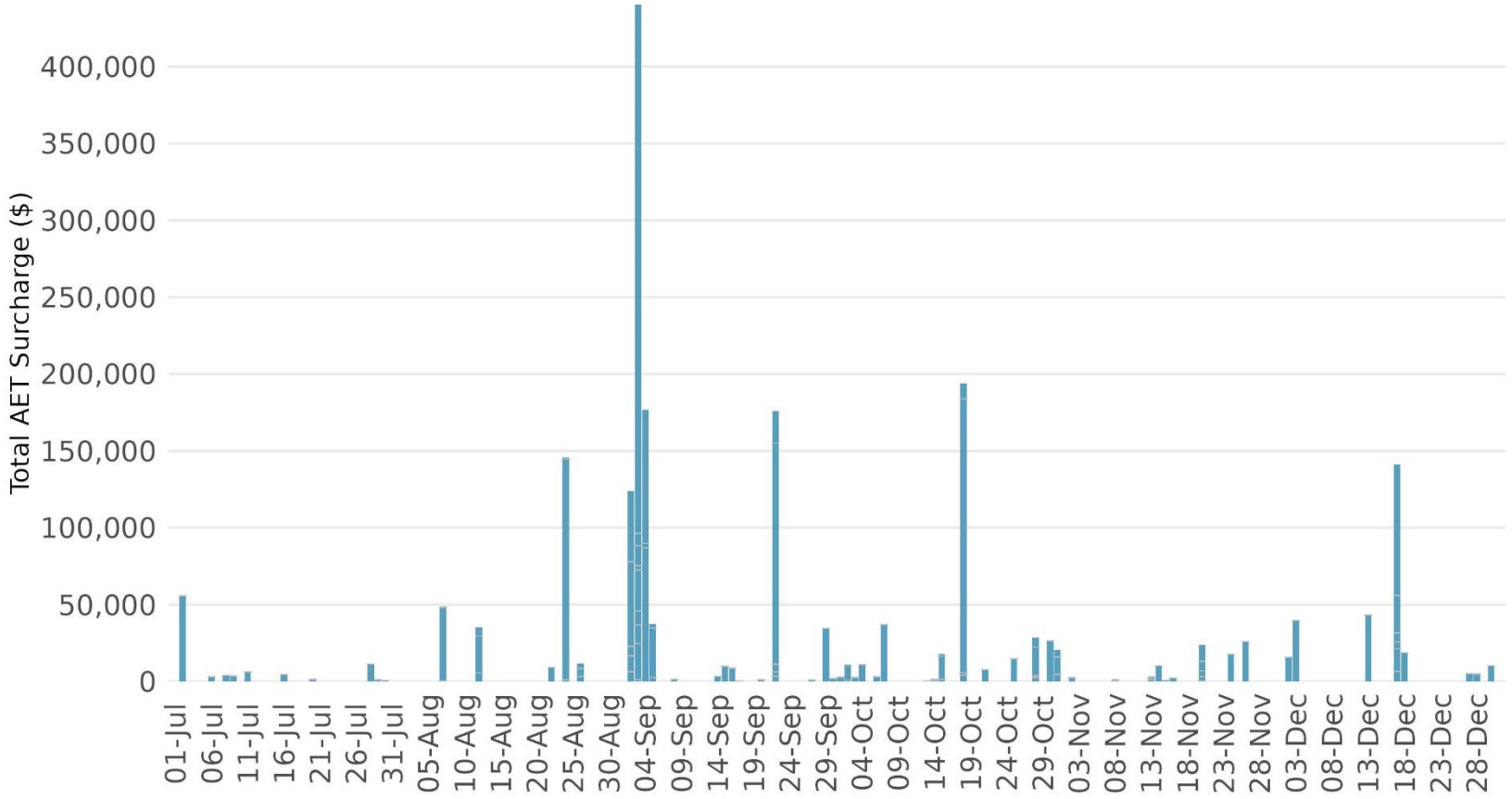
Flexible ramp down failures for the last 6 months are low, with the highest value at 2.2%



5 WEIM balancing areas opted–in for the assistance energy transfer (AET) for the last quarter of the year



The total AET surcharge assessed in the last quarter was $748K, lower than the previous quarter (Q3) at $1.36 million



Market Disruptions

Market Performance and Advanced Analytics

Enhancement to mitigate for market disruptions

Action taken: CAISO has implemented a market enhancement to mitigate for market disruptions observed in the real-time market

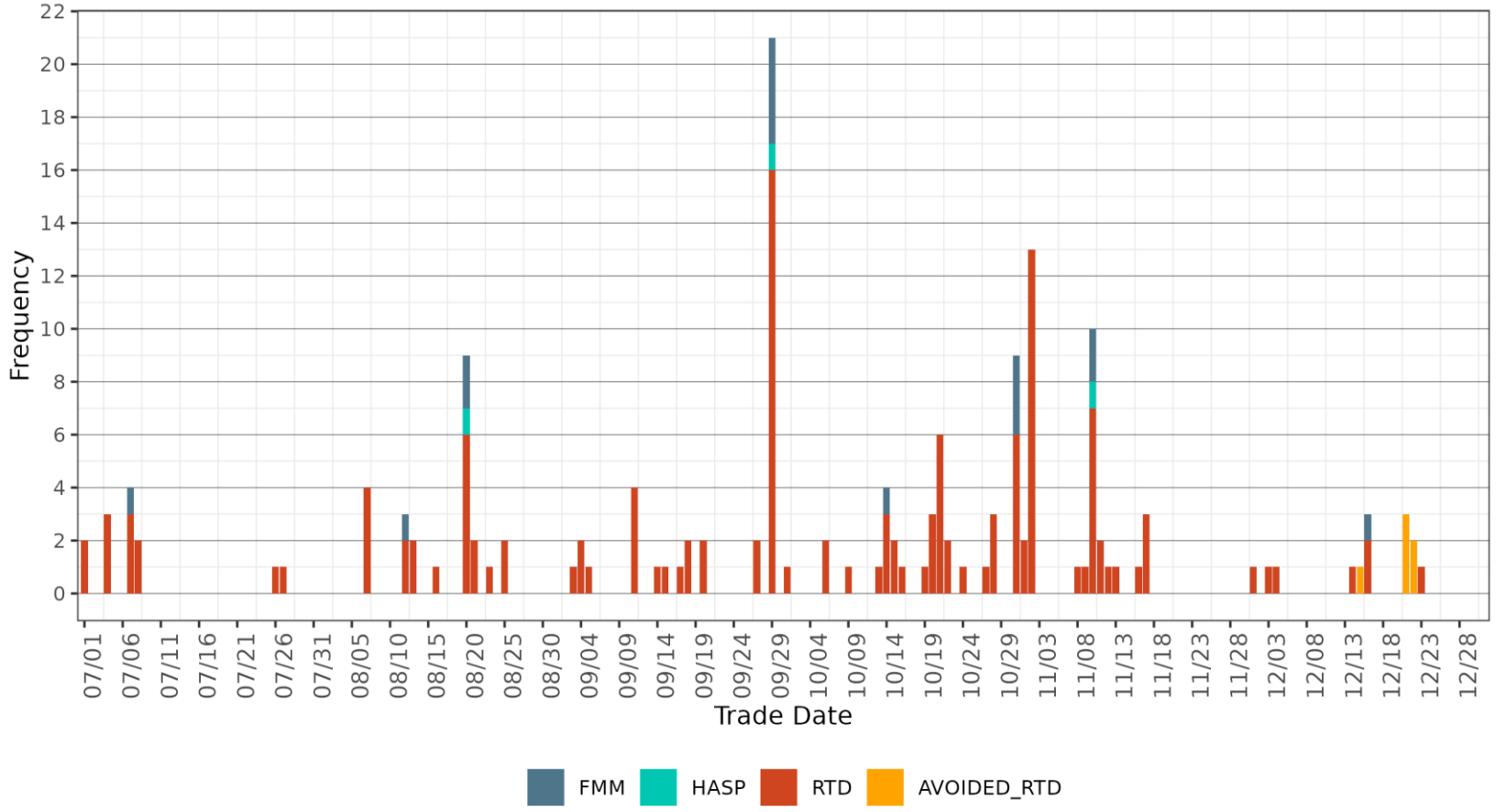
Impact: Reduced market disruptions in real-time and reduced accompanying manual actions taken in real time

Next Steps: CAISO will continue to monitor the frequency of market disruptions in the real time market

A software enhancement has eliminated the practice of excluding resources from participating in the real-time market

- As part of the market clearing process, the CAISO implemented a software enhancement to identify infeasible constraints and the magnitude of the infeasibility
- The market then finds a solution by clearing schedules and awards for all resources by relaxing it by the amount of the infeasibility
- The resource with the infeasible constraint gets an optimal dispatch
- Although infrequent and potentially minor, there may be instances where the resource with relaxed constraint cannot meet dispatch

Market disruption frequency dropped after software enhancements were implemented; there were six avoided market disruptions in RTD



RTPD Enhancement to Consider the Terminal Condition

Operations, and Market Performance and Advanced Analytics

What is the Terminal Condition?

- A specific operational scenario considering the Minimum Down Time (MDT) involving only long-start resources (cycle time > 255 minutes) with Day Ahead awards, where there is a gap in the DA schedule.

				01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21
BAA	Name	PMin	PMax	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]	[MW]
CISO	BUCKBL_2_PL1X3	125.00	493.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CISO	COLUSA_2_PL1X3	110.31	641.00	310.70	311.00	311.00	295.00	295.00	307.70	311.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	175.18	229.90	275.75	325.25	484.40	534.50	610.60
PACE	CURRCRK_7_UNITS	15.00	530.00	339.20	425.00	291.31	293.65	327.00	290.86	201.45	142.45	141.74	141.16	140.70	191.55	402.52	401.09	399.62	399.62	402.52	363.68	414.44	418.75	420.81
PACE	DAVEJOHN_7_UNIT 3	10.00	223.00	100.00	110.00	100.00	100.00	100.00	110.00	110.00	110.00	110.00	110.00	110.00	155.00	155.00	155.00	155.00	155.00	155.00	155.00	155.00	155.00	155.00
PACE	DAVEJOHN_7_UNIT 4	10.00	330.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00	260.00
CISO	DELTA_2_PL1X4	231.00	880.00	545.00	545.00	545.00	545.00	510.00	510.00	312.50	245.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	245.00	312.50	510.00	545.00	793.00	836.00
PACE	DYNAMO_7_UNITS	15.00	602.00	483.00	483.00	434.37	441.00	444.83	483.00	483.00	361.00	410.47	483.00	483.00	483.00	481.00	479.00	478.00	477.00	475.00	477.00	390.98	397.19	483.00
CISO	GATWAY_2_PL1X3	133.00	585.00	529.90	538.30	539.60	540.20	524.81	472.41	455.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	194.00	253.90	267.69	431.90	472.41	501.00
PACW	HERMISTO_7_UNIT 3	15.00	252.00	212.00	213.00	213.00	214.00	214.00	214.00	213.00	213.00	171.48	171.38	209.00	207.00	206.00	205.00	204.00	204.00	203.00	203.00	204.00	204.00	205.00
CISO	HIDSRT_2_UNITS	200.00	850.00	804.00	806.00	807.00	783.00	784.00	786.00	787.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	782.00	785.00	786.00	788.00

Red is Gap between DA Awards, Green is MDT

- Should RTD economically retain the resource online beyond its DA schedule (or the Generation Dispatcher blocks the shutdown for evaluation) into its MDT:
  - The Terminal Condition occurs: The resource must remain online until its next scheduled DA start.

The ISO is exploring an enhancement of the logic for managing Terminal Condition

1. Only for DA Long Start resources (resources with cycle time >255 minutes)
   i. Where the period between DA awards is equal to their min down time
2. The market will treat the above RTPD shutdown as binding;
   i. RTD will not keep the resource online
   ii. A new Terminal Condition Reason code will be displayed on the Unit Start-up/Shutdown UI for operator awareness
   iii. Should the Gen Dispatcher require the resource to stay online:
      a. An ED will be required (normal ED process).
3. All other DA long start awards are treated the same as today, not binding RTPD and no Terminal Condition UI message

Benefits of the Software Enhancement

- Eliminates undesired Terminal Conditions
- Reduces participants' concerns about resource dispatches and potential disputes
- Improves operator awareness
- Provides ability to override should conditions require the resource online
- The ISO will initiate a BPM process change to implement this enhancement

Market Issues

Market Performance and Advanced Analytics

Short Term Forecasting

Issue 1: RTD Mitigation in intervals 11-12

- The ISO discovered a software issue where the RTD market incorrect designated certain transmission constraints as non-competitive in intervals 11-12 due to a bid processing issue.

- This issue may have led to over-mitigation of some resources in the RTD market.

- The issue was present from March 2021 to September 2025.

Issue 1: RTD Mitigation in intervals 11-12

For the five-year period during which this issue existed, the potential impact is limited

Year	Total Constraints with RTD Intervals Possibly Over-Mitigated	Highest percentage of RTD intervals flagged
2021	99	0.48%
2022	125	1.22%
2023	103	0.50%
2024	88	0.43%
2025	92	2.03%
2021-2025	299	0.35%

The table summarizes

i) the number of constraints that may have been incorrectly designated as non-competitive, and

ii) for the constraint with the greatest impact, the percentage of RTD intervals flagged with the issue

Issue 2: July 7, 2025 LMP MCC Issue

- In the day-ahead market for trade date July 7, 2025 the ISO associated an ISO nomogram with the incorrect Balancing Authority.

- The OMS_17906124_TL50005_NG was active and binding with a shadow price in three hours on July 7, 2025 (HE 9, 17, 18) but the Marginal Component for Congestion (MCC) for SP-Tie transactions did not accurately reflect the nomogram congestion.

- Internal Resource LMPs were not impacted and accurately reflected the nomogram congestion.

Issue 2: July 7, 2025 LMP MCC Issue

- The issue impacted day-ahead energy settlements (CC6011) for Intertie Resources and the overall impact for the three hours is that Intertie transactions should have received a lower charge for energy:

HE	Current CC 6011 Charges	Revised CC 6011 Charges	Difference
9	($44,404.00)	($42,257.48)	$2,146.52
17	($131,124.00)	($134,130.07)	($3,006.07)
18	($139,787.00)	($128,763.19)	$11,023.81
Grand Total	**($315,315.00)**	**($305,150.74)**	**$10,164.26**

- The issue was discovered after the expiration of the price correction time horizon; therefore, LMPs could not be corrected, and the current charges will remain in place.

Issue 3: Bidding expectations for Co-located resources using the Off-Grid Charging Indicator

- Co-located storage resources providing flexible (flex) resource adequacy (RA) can also use the off grid charging indicator (OGCI).

- The OGCI prevents resources from receiving market awards to charge from the grid and only allows for charging market awards up to the generation of the co-located generation resource.

- Storage resources are able to provide flex RA for their charging and discharging ranges, thus they are able to provide flex RA for up to twice the value of their Pmax.

- If the OGCI is active, the market does not have access to their charging range unless the co-located generation resource is generating.
  - This is not captured in RAAIM penalties.

Issue 3: Bidding for Co-located resources using the Off-Grid Charging Indicator (OGCI)

- PRR 1658 submitted for Market Operations BPM will state Co-located storage resources using the OGCI hourly biddable parameter should be aware of the obligation under tariff section 37.3.1 for resources to submit feasible bids

- PRR 1659 submitted for the Reliability Requirements BPM to clarify submitting accurate flex RA

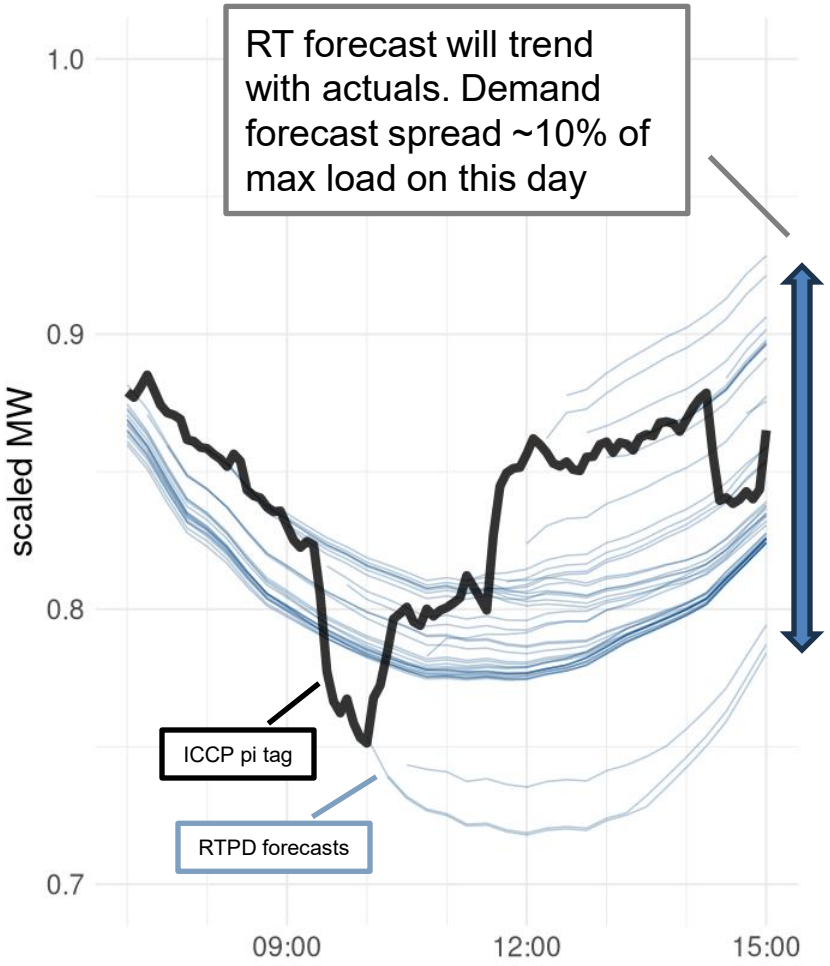
- Storage resources receiving EFC based on their charging range should be mindful of how charging limitations can impact their ability to meet the must-offer obligation for a given category of flexible RA.

Issue 4: Incorrect use of Default Energy Bids

- From Sep 22-Oct 2, 2024, two resources were missing the distillate index for a negotiated DEB and a $2000 DEB was inserted.
- From Jun 9 – Jul 31, 2025, a WEIM Storage resource selected the Storage DEB which is currently not available to WEIM resources.
- From Dec 12-19, 2025, eight WEIM resources had inactive negotiated DEBs active in Production.
- In all instances, the incorrect DEBS were not used for dispatch and did not impact market prices. There are no corrective actions.

Issue 5: BAA Data Input Errors Impact to Forecasting

- Forecast data quality is critical to maintaining forecast accuracy
- Compromised telemetry quality most directly impacts:
  - Real time load forecasts
  - Uncertainty products (IR, FRP) if issues persist
- Examples of recent errors:
  - New or existing market-participating battery resource had telemetry that was incorrectly incorporated into BAA-level load
  - New (post-COD) co-located resource generation lowering load



Renewable Persistence Enhancement: Solar Rayborhood

Short Term Forecasting

Background

- RTD Renewable Persistence forecast has been activated for both wind and solar resources since 2018 for CAISO BAA and WEIM entities
- Solar persistence requires reference curves for activation;
  - Prerequisite of reference curves is 1 year of settlement quality metering data
- The ISO has been exploring a potential new option to extend the benefit of persistence forecast to relatively new solar resources in WEIM as well as in the ISO
- The Solar Rayborhood method utilizes an existing solar unit which has an established reference curve as the surrogate

Rayborhood Resource Qualifications

1. Similar Unit type to requested resource, the sizes may be different
   - Similarity includes, but is not limited to, technology type, resource management, and equipment installation

2. Within 50 miles

3. Has existing reference curves in the ISO

1. Not a Hybrid resource type

Rayborhood Simulation Result Outcomes

Time Period Analyzed October 2025 through November 9, 2025

Resource	Pmax	mape_alfs	mape_rbh	Rayborhood(dist_miles)
Res_id1	3.00	3.04%	2.41%	12.66
Res_id2	2.56	8.48%	2.04%	12.66
Res_id3	5.00	2.62%	2.17%	12.66
Res_id4	179.00	1.15%	0.79%	8.61
Res_id5	3.00	2.66%	1.87%	5.45
Res_id6	2.37	6.76%	4.69%	5.45
Res_id7	300.00	1.60%	1.00%	4.56
Res_id8	2.25	5.20%	2.51%	4.52
Res_id9	3.00	2.61%	2.13%	4.46
Res_id10	3.00	10.80%	7.58%	4.22
Res_id11	58.00	1.78%	1.20%	2.49
Res_id12	70.00	1.76%	1.26%	2.49
Res_id13	19.90	1.74%	1.31%	2.37
Res_id14	11.90	1.81%	1.29%	2.37

Resource	Pmax	mape_alfs	mape_rbh	Rayborhood(dist_miles)
Res_id1	300.00	1.60%	1.00%	4.56
Res_id2	300.00	1.68%	1.04%	1.21
Res_id3	200.00	2.10%	1.25%	1.35
Res_id4	200.00	4.50%	1.35%	0.77
Res_id5	179.00	1.15%	0.79%	8.61
Res_id6	150.00	1.30%	0.95%	1.11
Res_id7	150.00	1.69%	0.85%	0.00
Res_id8	132.10	1.04%	0.77%	2.15
Res_id9	131.00	1.40%	0.91%	0.01
Res_id10	125.00	1.18%	0.87%	0.35
Res_id11	125.00	1.01%	0.90%	0.35
Res_id12	120.00	1.78%	1.06%	0.68
Res_id13	113.50	4.78%	1.82%	0.93
Res_id14	100.00	5.28%	1.53%	0.77

Next Steps and Timeline

Task Item	Estimated Timeline
Draft BPM Changes	December 2025 – January 2026
Submit BPM Changes into PRR Process	January 2026
Following BPM Approval and Publication Implement for Trialed and Requested Rayborhood Resources	March 2026

1. **Submit Proposed Revision Request (PRR)**
2. **Comments period**
   Upon ISO acceptance, PRR becomes public and 10-business day comment period starts
3. **Stakeholder meeting**
   PRR details and comments reviewed and discussed
4. **Recommendation**
   ISO recommendation issued on PRR
5. **Comments on recommendation**
   10-business day comment period open on recommendation
6. **Stakeholder meeting on recommendation**
   PRR recommendation and comments reviewed
7. **Final decision***
   BPM updated or not updated

Lunch Break

Resume back at 1:00pm

Policy Update

Market Policy Development

Congestion revenue rights enhancements

- The scoping phase of the initiative has concluded and policy development has begun, focusing on key challenges identified:
  - Improving revenue adequacy and auction efficiency
  - Updating how CRR products are defined, especially the Time of Use periods, to better align with evolving hedging needs

- Recent initiative activity:
  - December 12: Published Issue Paper and Straw Proposal on CRR Product Definition
  - January 14: Published Issue Paper on Revenue Adequacy and Auction Efficiency Enhancements
  - January 21: Stakeholder meeting to discuss both papers, with comments due February 4

- CRR policy development will continue to account for any relevant outcomes from the ongoing EDAM Congestion Revenue Allocation initiative

- Proposed decisional classification: CAISO Board of Governors

Demand and distributed energy market integration

- Transitioning from scoping phase to policy development in 2026. We are anticipating publishing an issue paper in 2026.

- The scope is informed by the problem statements and prioritization identified by the DDEMI working group.
  - Key areas of focus will result in:
    - Developing and/or enhancing market models to support demand-side bidding and exporting from distributed resources
    - Updating performance evaluation methodologies
    - Streamlining and simplifying participation
    - Accommodating large load demand flexibility

- Discussion Paper posted on Nov 26, 2025
- Proposed decisional classification: TBD

EDAM congestion revenue allocation

- Phase 2 of the initiative focuses on development of along-term durable congestion revenue allocation design and potential near-term enhancements.

- This phase of the initiative kicked off on December 11th through a stakeholder working group.

- Initial working groups are focused on development of principles to guide consideration of design options.

- Continued development of analysis based on EDAM market simulation and parallel operations data evaluating impacts of phase 1 of the congestion revenue allocation design.

Storage design & modeling

- Scope of the initiative has been organized into four topic groups:
  - Outage management
  - Uplift, mitigation & default energy bids
  - State-of-Charge management
  - Mixed-fuel & distribution-level resources

- An updated Discussion and Issue Paper on Uplift & Default Energy Bids was posted December 12
  - Builds upon prior initiatives and stakeholder engagement to outline problem statements, guiding principles, and conceptual policy recommendations
  - Examines the relationship between storage uplift and market design, assesses the risks and feasibility of policy recommendations, and explores frameworks for long-term enhancements to bid cost recovery and default energy bid rules

- Targeting upcoming papers on Mixed-Fuel and Distribution-Level Resources and Outage Management

Price Formation Enhancements Initiative

- CAISO presented PFE to the WEM Governing Body as a "spotlight briefing" during their general session on October 28, 2025
  - With an accompanying stakeholder presentation by Vitol
- In November 2025, the CAISO held two stakeholder working group sessions dedicated to comprehensive scarcity pricing design
- Market power mitigation and scarcity pricing was the topic of the Market Surveillance Committee general session meeting on January 16, 2026
- Decisional classification: Primary Authority of WEM Governing Body

Resource adequacy policy development

Track 1 and Track 3A approved by ISO Board of Governors

Track 1: Modeling & Default Rules

- Loss of load expectation modeling
- Updated default planning reserve margin and default counting rules

Track 2: Outage and Substitution & Availability and Performance Incentives

- Updating outage and substitution processes
- Reforming availability and performance incentives

Track 3: Visibility and Backstop Reform

- Increase the ISO's visibility into available backstop capacity (3A)
- Increase transparency to stakeholders on backstop decision making
- Update the current backstop product
- Create longer-term solutions for the ISO Balancing Authority Area around curing deficiencies and assigning costs related to the EDAM resource sufficiency evaluation

Gas Resource Management

- Approved by WEM Governing Body December 16, 2025
  - Changes to the multi-day ahead advisory market runs to improve fuel procurement forecasts available during gas nomination timelines
  - Additional options for cost inputs, fuel cost adjustments, and recovery
  - Considerations for managing a resource's gas system limitations

- Developing proposed tariff modifications in preparation for a filing at FERC

- Developing proposed BPM modifications to reflect process changes that do not require new tariff authority

Commitment cost bidding flexibility

- The *commitment cost and default energy bid* policy was approved in 2018 but the changes relating to commitment costs bidding flexibility and mitigation were never implemented
  - The policy provides an expanded ability for resources to bid in their commitment costs, paired with a new test for market power associated with those commitment cost offers

- Evaluating the implementation feasibility of the approved design and will look to share results with stakeholders in late Q1 2026

2026 Market Policy Catalog & Roadmap Process

- Final 2025 Policy Roadmap and Final 2025 Policy Catalog published
- **January 15:** Catalog submissions template posted via ISO commenting tool
- **January 15 – March 2**: ISO accepting catalog submissions for new market policy initiatives from all stakeholders
- **March & April**: Stakeholder prioritization workshops for catalog submissions + RIF Roundtable
  - Clarify purpose of submissions
  - Develop understanding of breadth of stakeholder support for individual submissions
  - Identify logical groupings of submissions
- **May**: Stakeholders submit prioritization rankings

2026 Policy Calendar

		2026			
		Q1	Q2	Q3	Q4
Commitment Cost Bidding Flexibility		Public dialogue: next steps			
Congestion Revenue Rights Enhancements		Policy development			Decision
Demand and Distributed Energy Market Integration		Policy development		Decision	Implementation
EDAM Congestion Revenue Allocation		Policy development			Decision
EDAM Enhancements		As needed			
Finance Enhancements		Policy development			
Gas Resource Management				Implementation	
Greenhouse Gas Coordination				Implementation	
Price Formation Enhancements					
	Scarcity pricing & market power mitigation	Policy development			Decision
	Fast start pricing	Postponed			

2026 Policy Calendar (cont.)

		2026			
		Q1	Q2	Q3	Q4
Resource Adequacy Modeling and Program Design					
	Track 1: Modeling and default rules		**Implementation**		
	Track 2: Outage & substitution and availability and incentive mechanisms	**Policy development**		**Decision**	
	Track 3a: Resource visibility				**Implementation**
	Track 3b: Backstop reform and long-term EDAM RSE solutions				**Policy development**
Storage Design and Modeling					
	Topic group 1: Outage management enhancements	**Policy development**		**Implementation**	
	Topic group 2: Uplift & default energy bids	**Policy development**		**Decision**	
	Topic group 3: State-of-charge management	**Policy development**			
	Topic group 4: Mixed-fuel & distribution-level resources	**Policy development**			
WEIM Resource Sufficiency Evaluation Enhancements		**Postponed**			

Release Update

Release Management

Next Forum:

April 29, 2026

**Tentative until confirmed though a in the ISO's Daily Briefing*

For reference

Visit user group webpage for more information: https://www.caiso.com/meetings-events/topics/market-performance-and-planning-forum

If you have any questions, please contact Brenda Marquez at bmarquez@caiso.com or isostakeholderaffairs@caiso.com

BPM change management: Definitions and Acronyms BPM Declassified as BPM

- The California ISO announces the declassification of the Definitions and Acronyms Business Practice Manual (BPM) with updated link on how to find ISO definitions and acronyms.

  The Definitions and Acronyms BPM previously served as a consolidated reference for all definitions and acronyms in the ISO Tariff and other BPMs.

  A link to the ISO glossary is now available in the BPM Library, where you can find the most current definitions and acronyms formerly included in the Definitions and Acronyms BPM. Definitions and acronyms will also remain accessible within the individual BPMs.

  For more information about the BPM Change Management process, please visit the BPM webpage on the ISO website.
- Glossary | California ISO

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By Joanne Serina, Allie Mace

01/14/2026

Story | Markets

Extended Day-Ahead Market – Virtual Town Hall

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Story | Leadership

ISO 2025 Year in Review: Powering forward on reliability, shared progress, and a new framework for independent market governance

By Elliot Mainzer

12/04/2025

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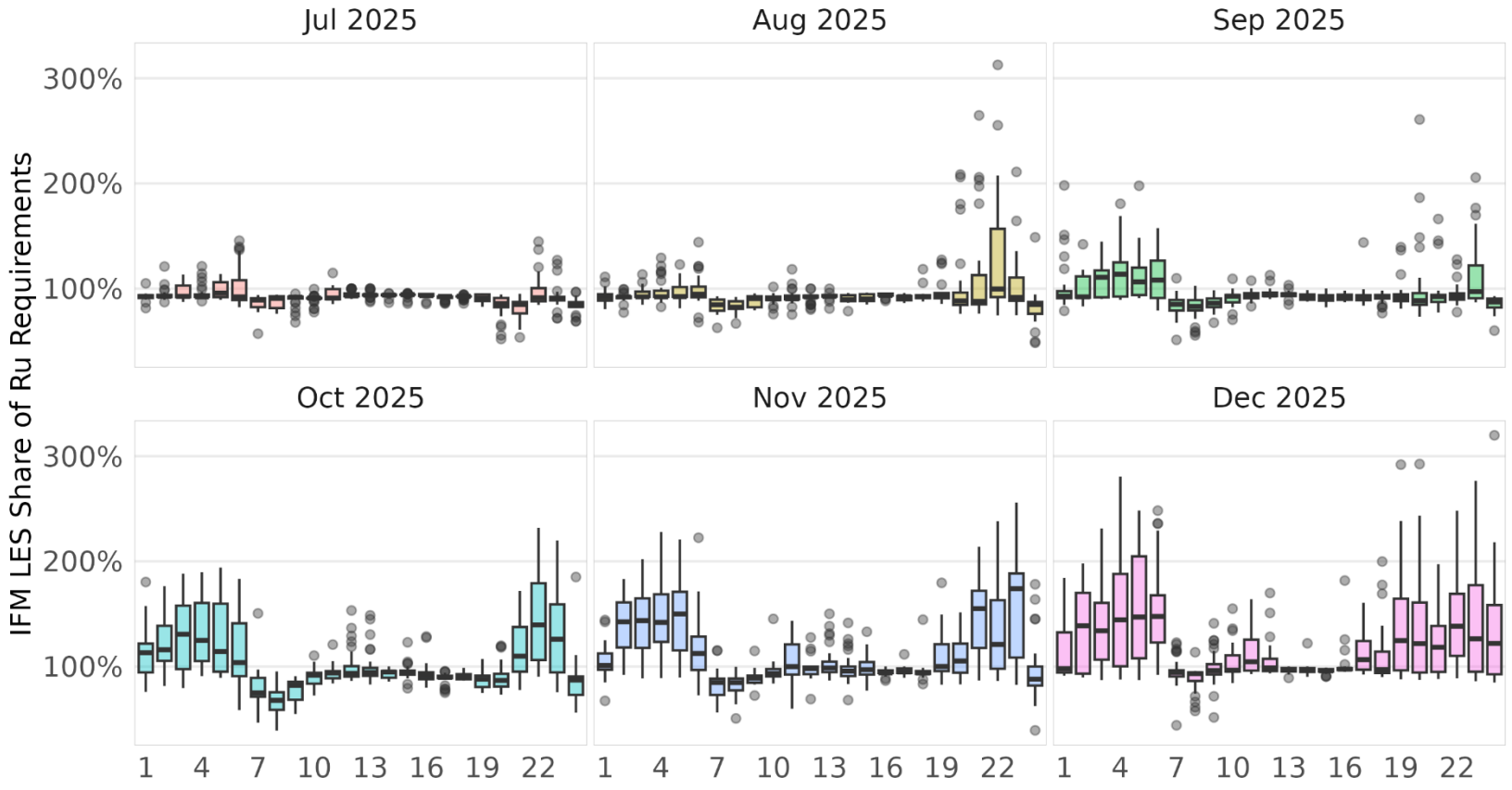
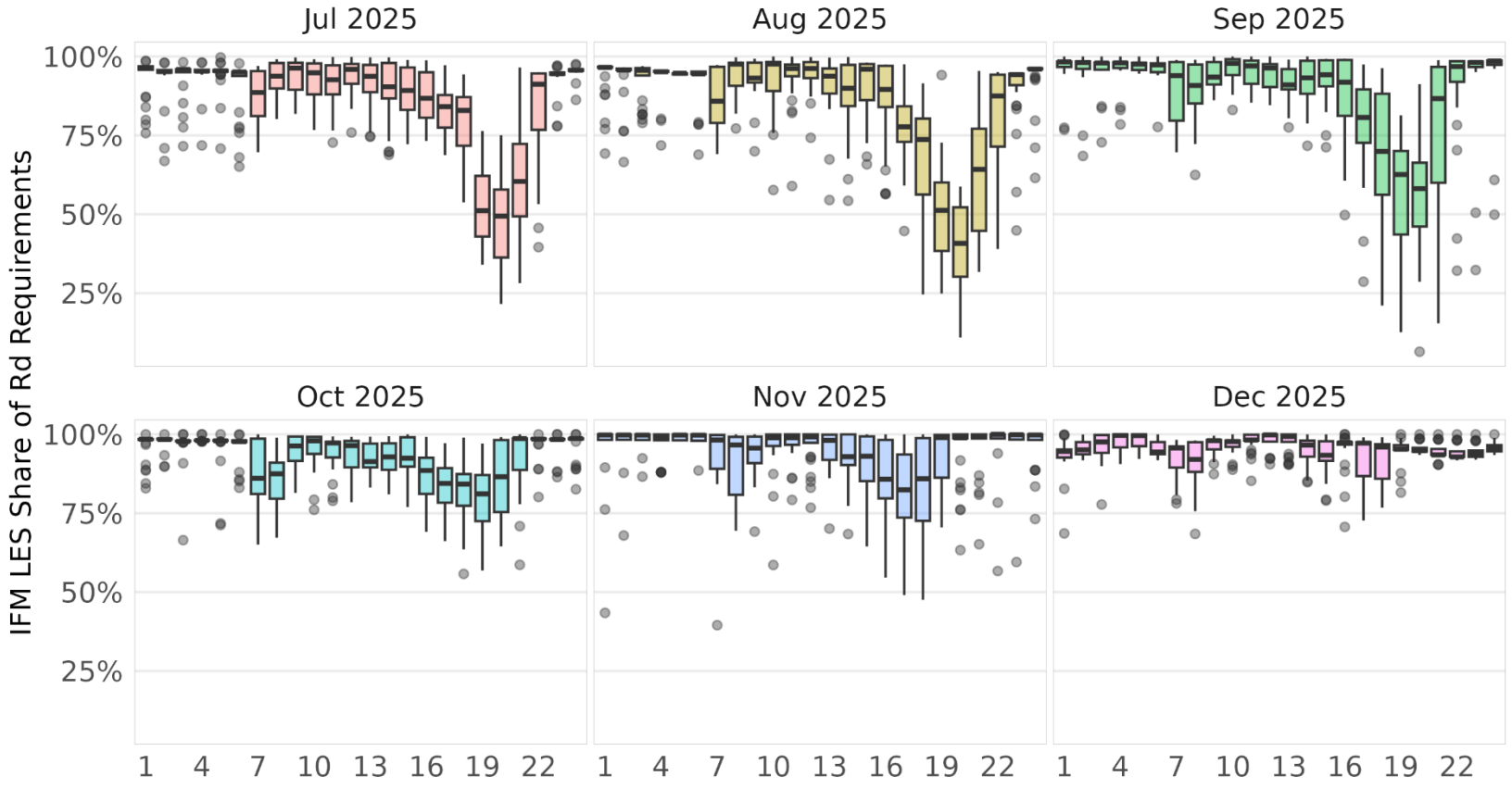
Appendix
General Metrics

Energy Storage Performance

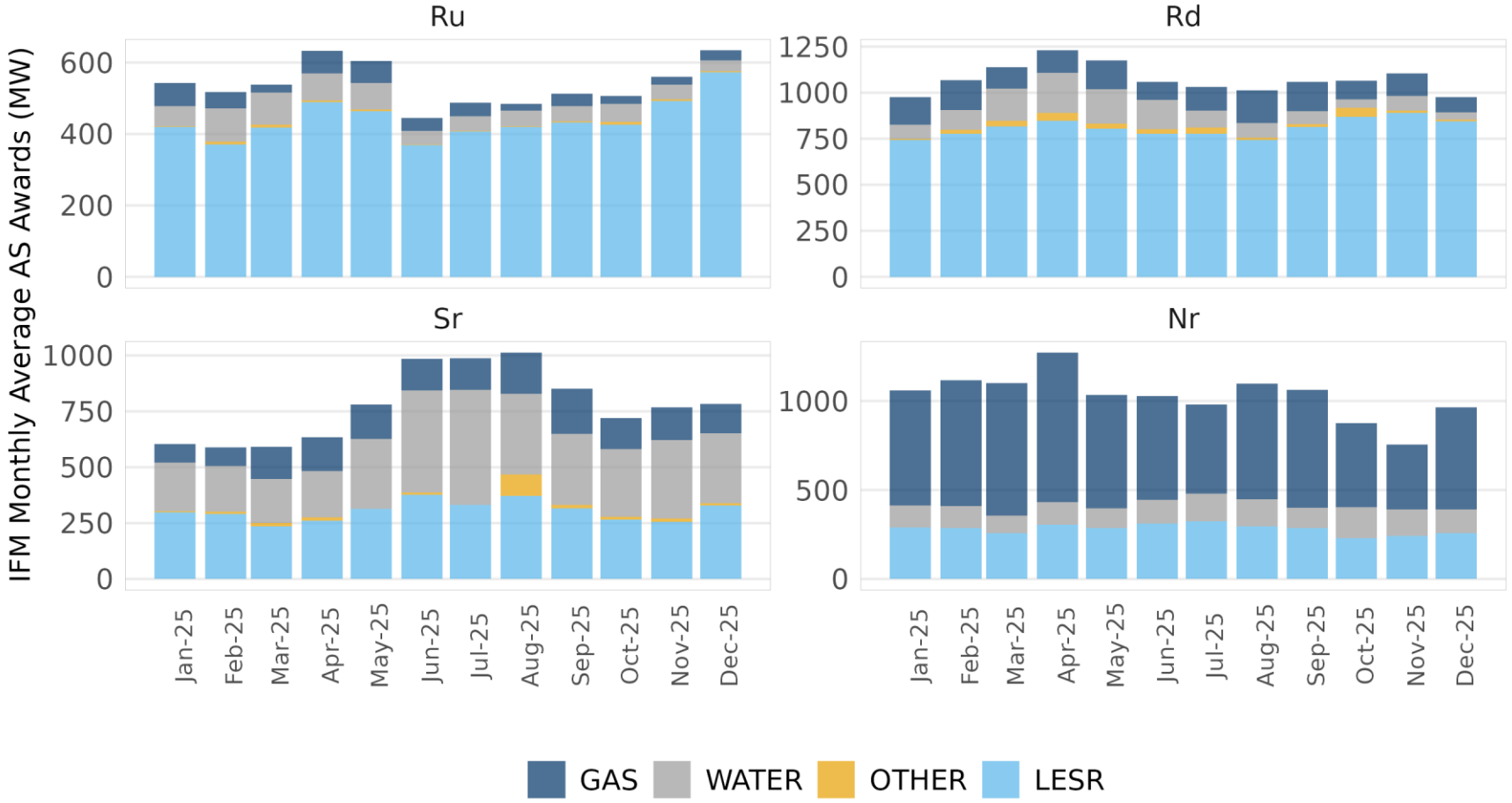
The hourly profile of the LESR percentage share of the Ru requirement increases in Q4 2025



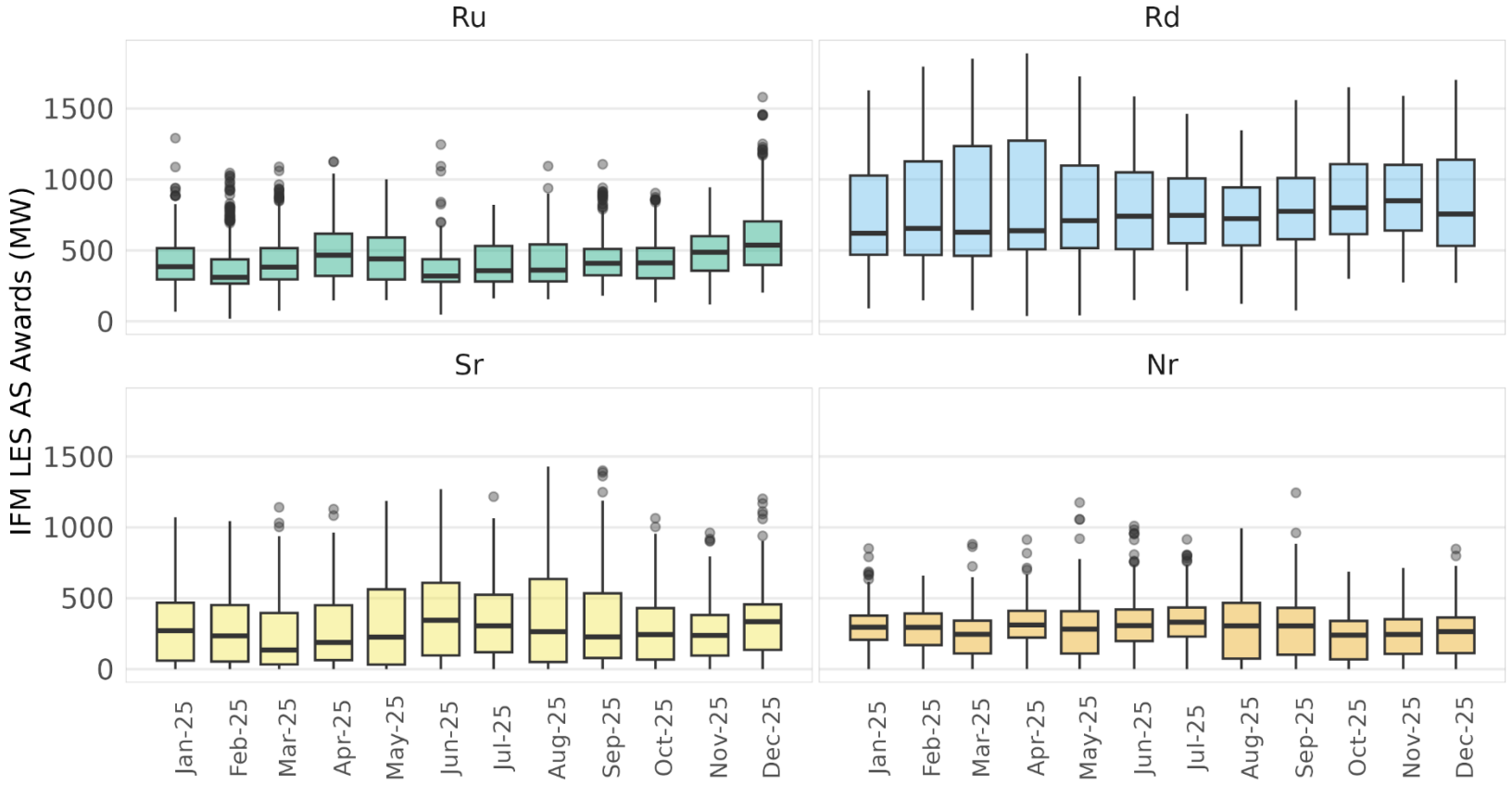
The hourly profile of the LESR percentage share of the Rd requirement increases in Q4 2025



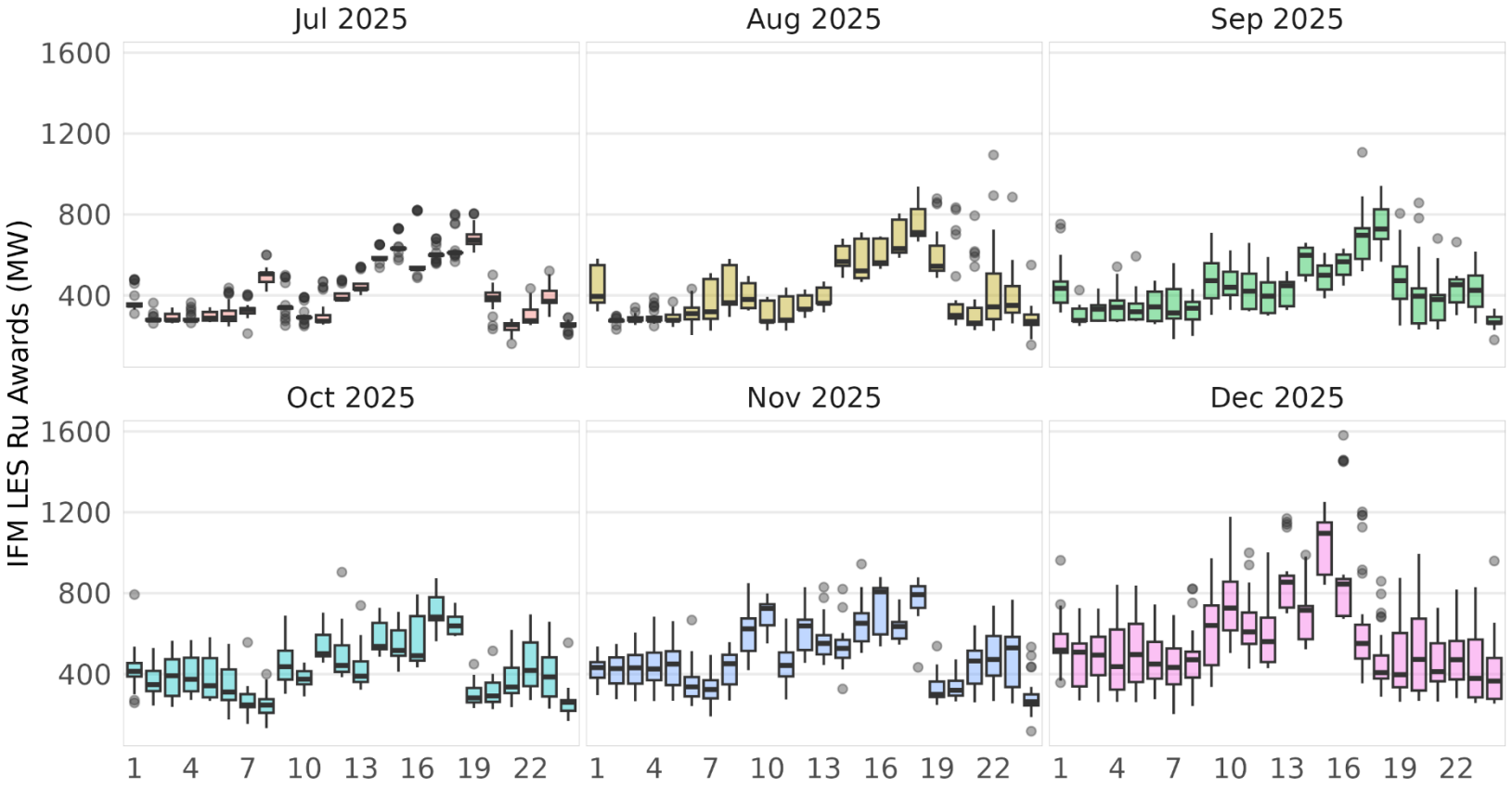
Monthly average IFM AS awards for storage shows slight reduction in Sr/Nr and increase in Ru/Rd in Q4 2025.



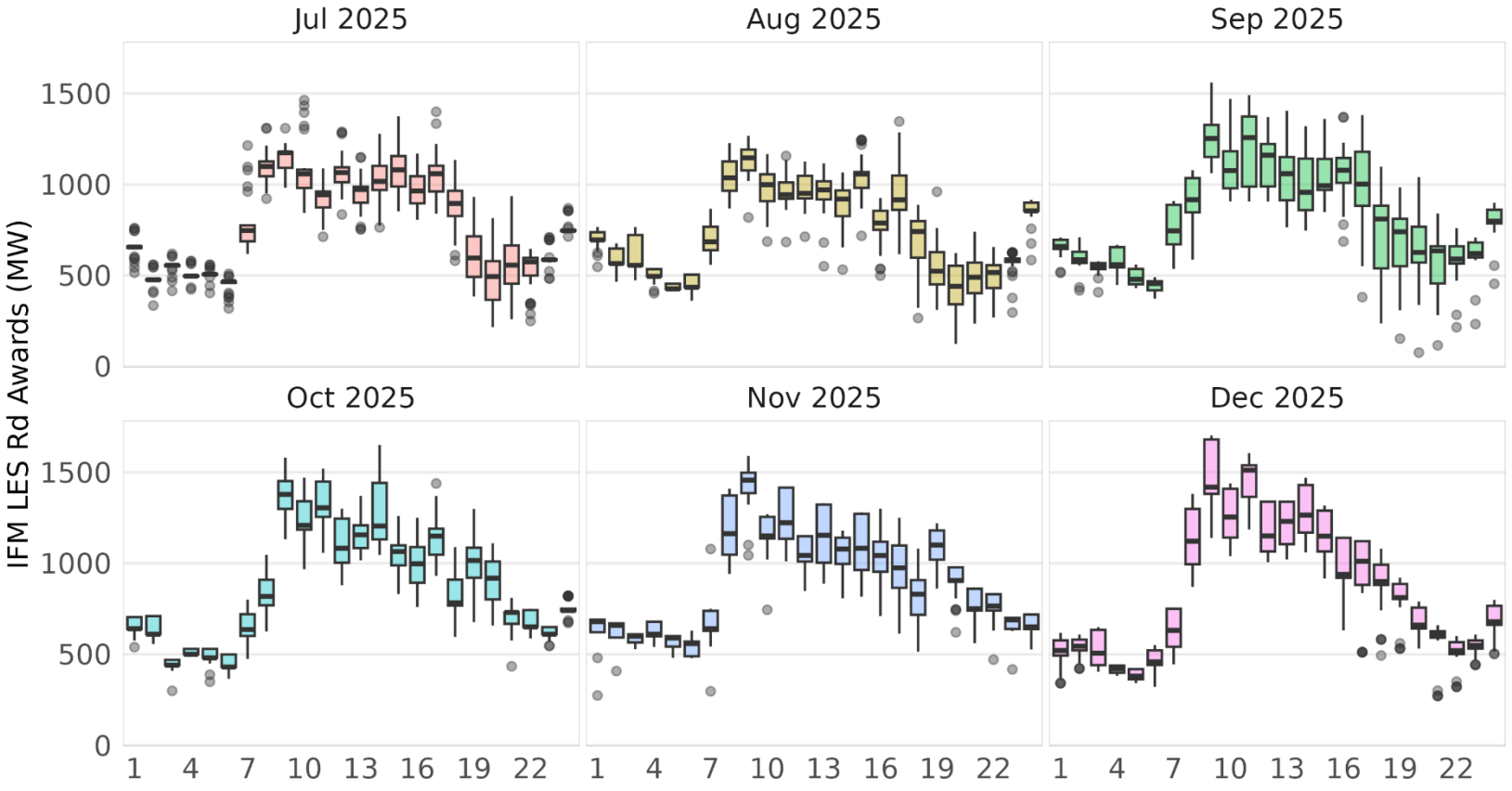
Monthly IFM AS market awards show no significant change in pattern



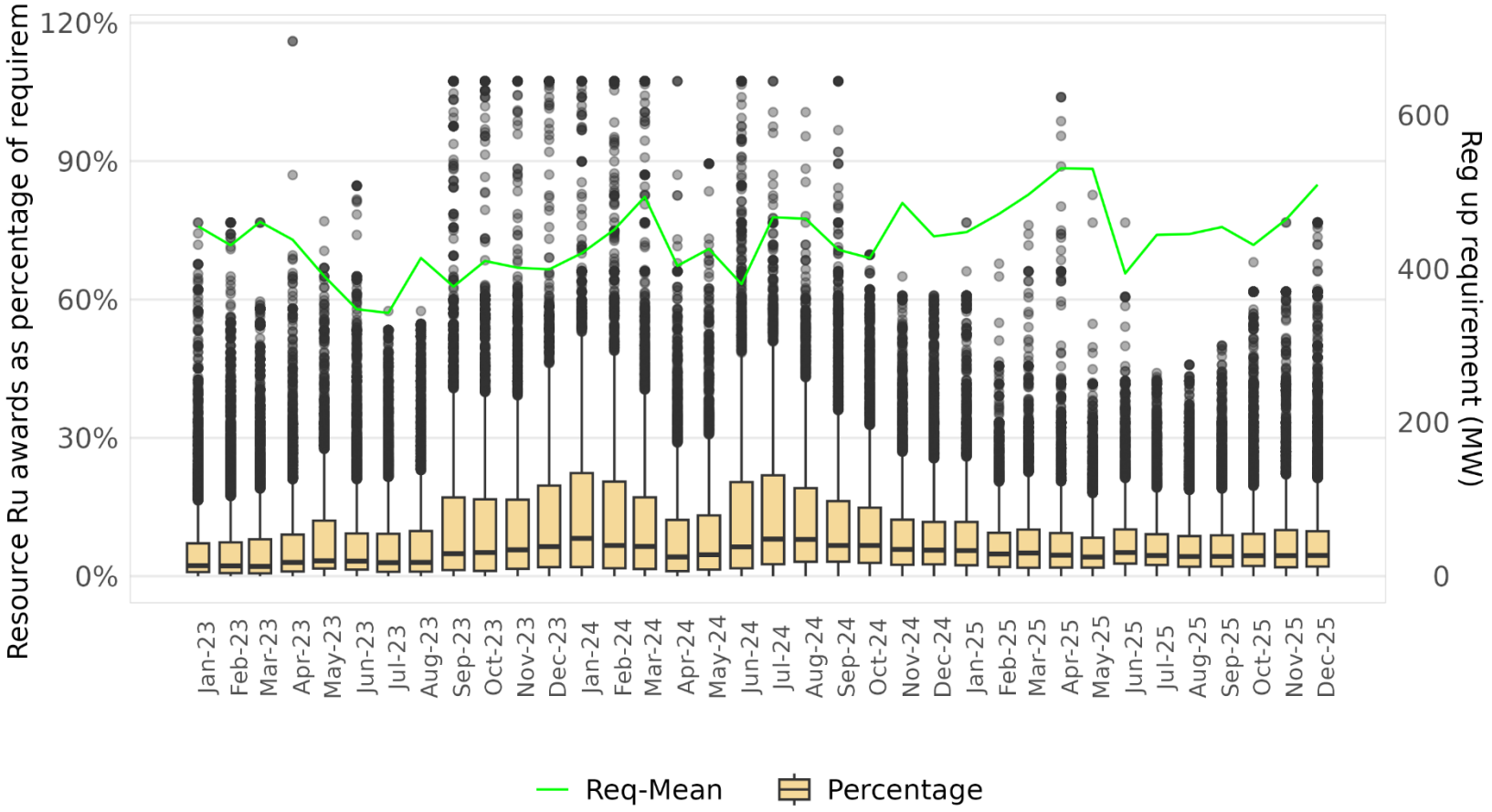
Regulation up awards in the day-ahead market have seen a slight increase in Dec 2025



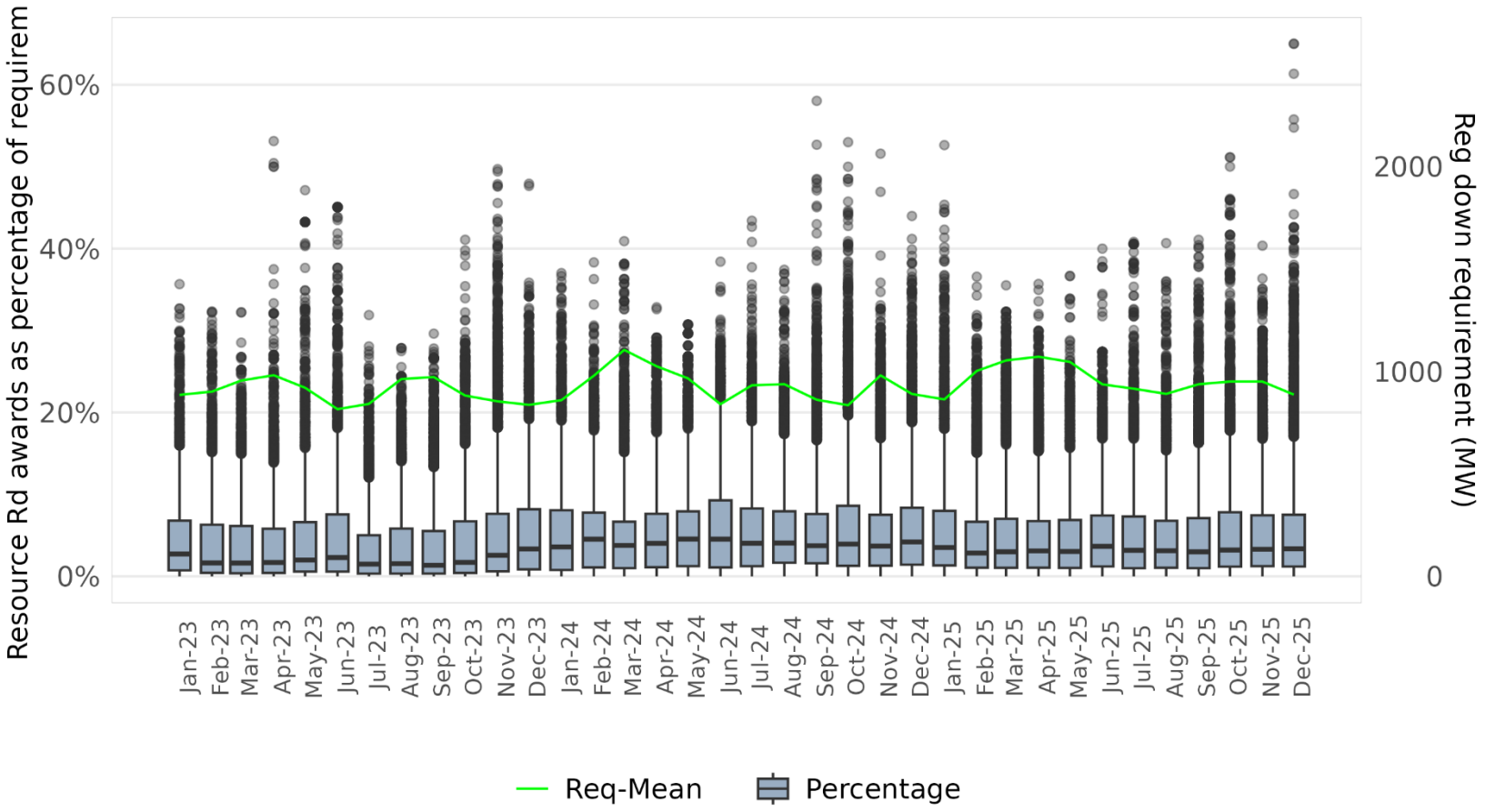
Regulation down awards in the day-ahead market have not seen a material change in trend



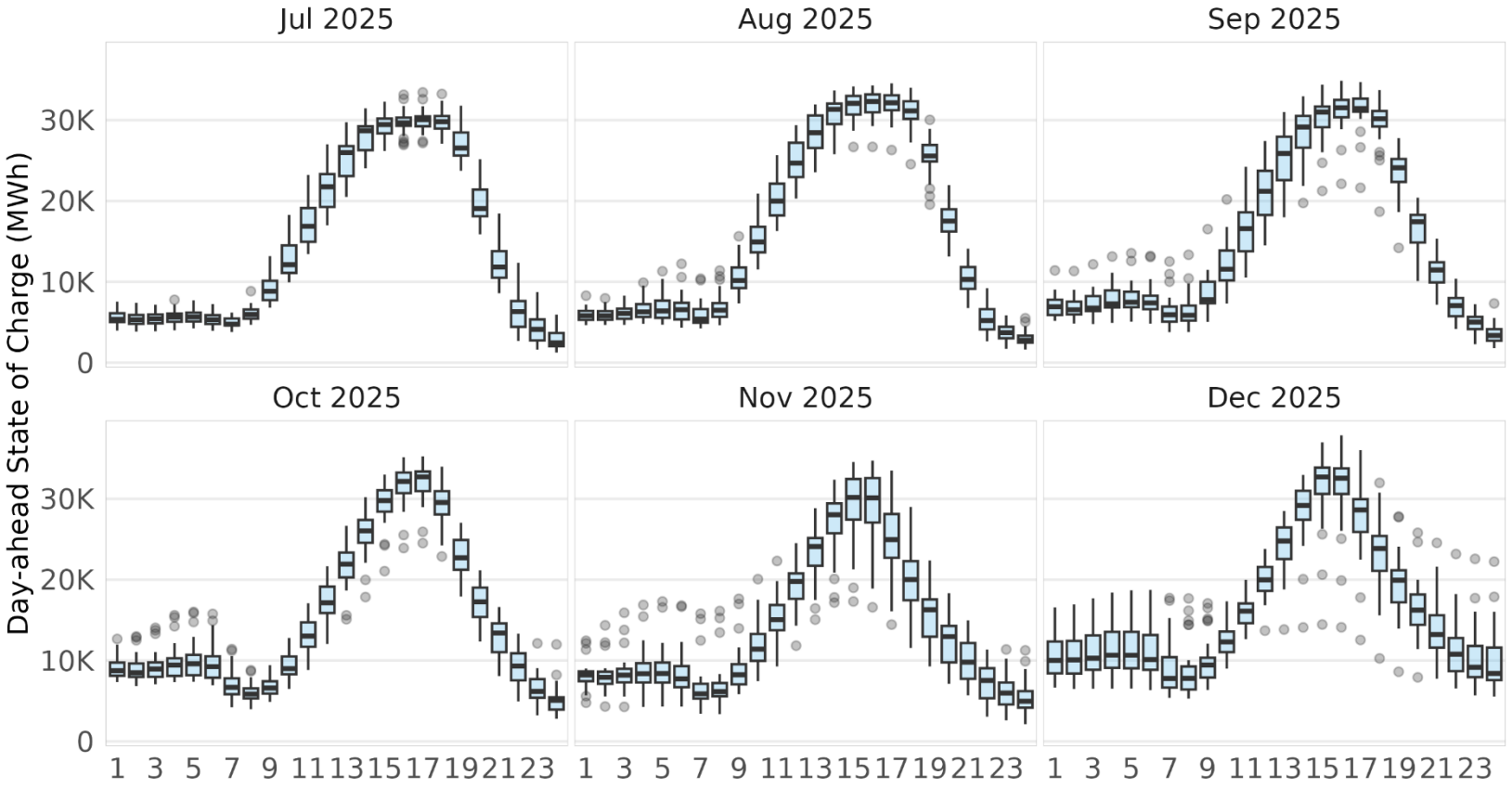
The relative size of Regulation award on individual resources tends to be within typical ranges



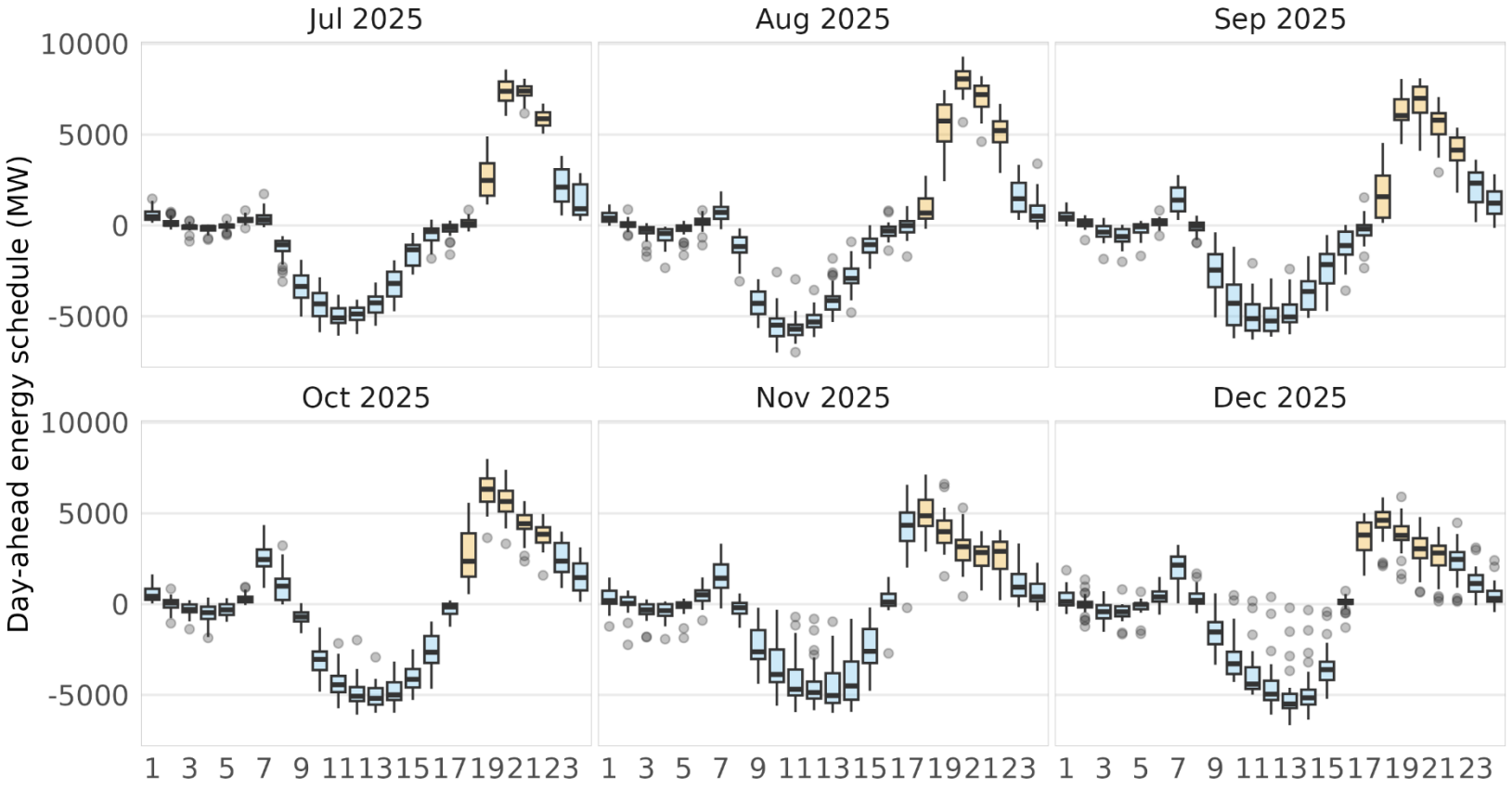
Resource Rd awards as percentage of Rd requirement sees not notable change in pattern with enhancements



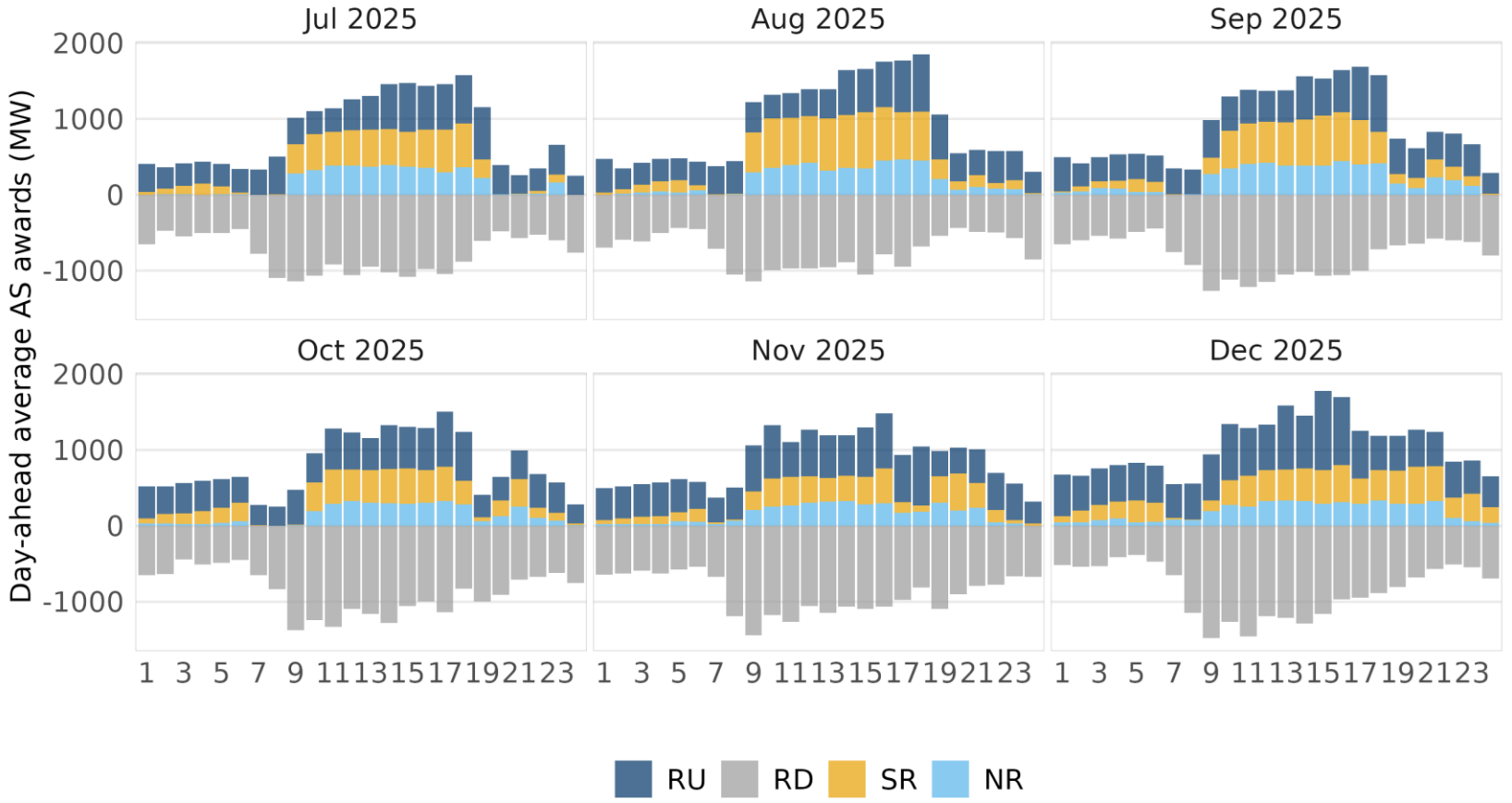
Day-Ahead state of charge for storage resources is typically achieved between hour ending 16 and 17



Storage resources were consistently charging during solar hours and discharging during net load peaks. Day-ahead

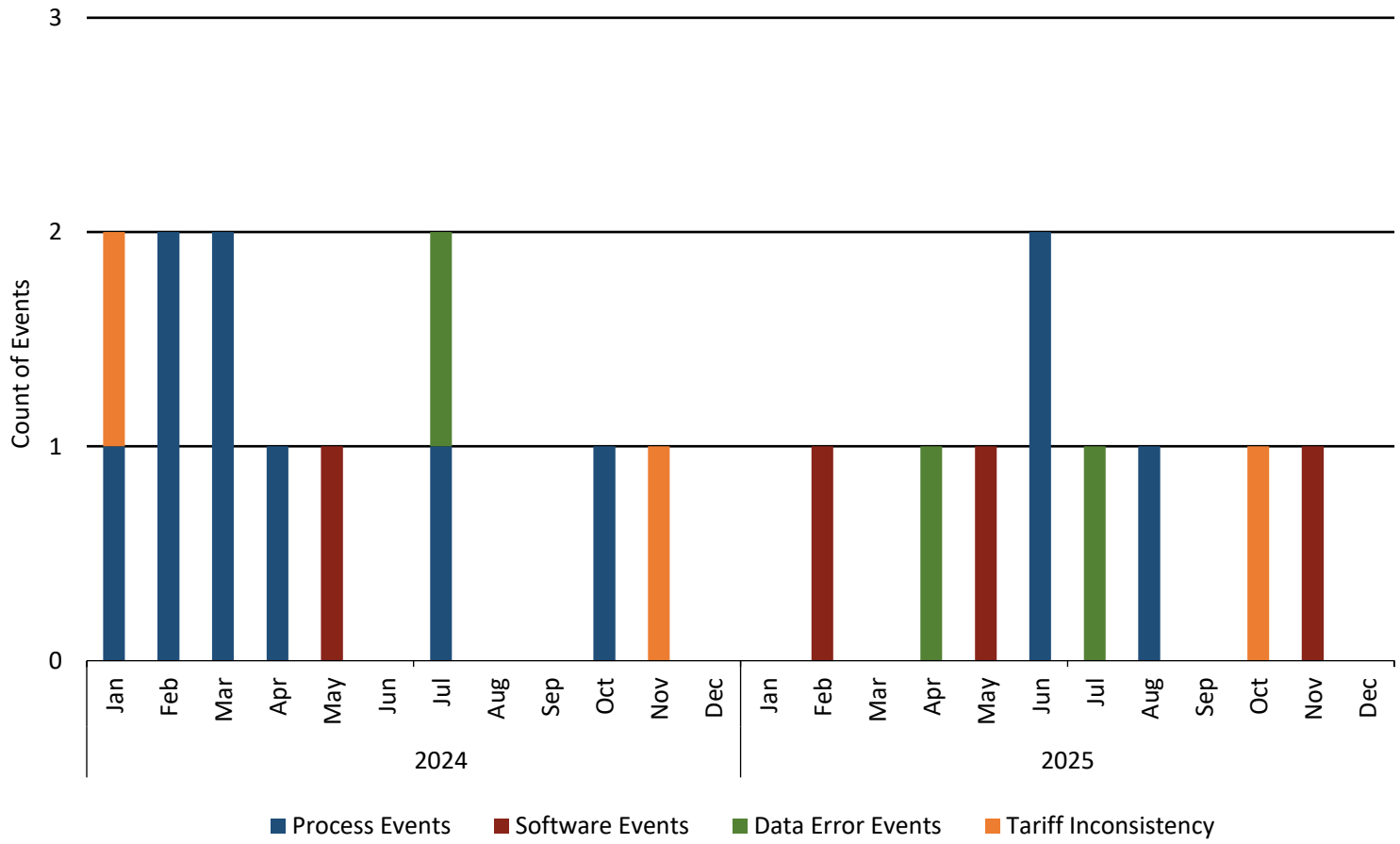


Storage resources procure mostly regulation while in recent months they have also increased the provision of Spinning reserves. Day-ahead

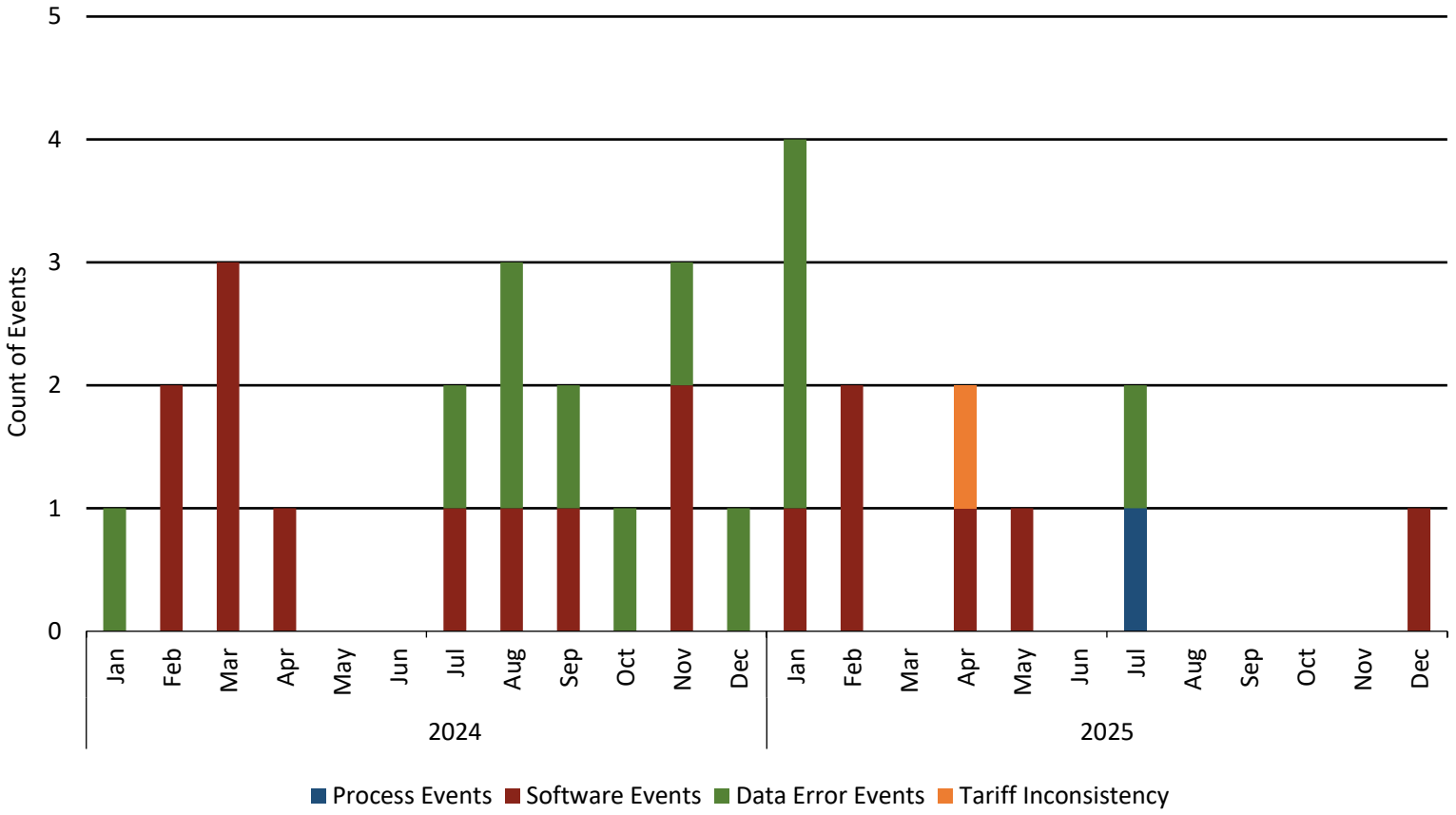


Price Corrections

CAISO price correction events remain low

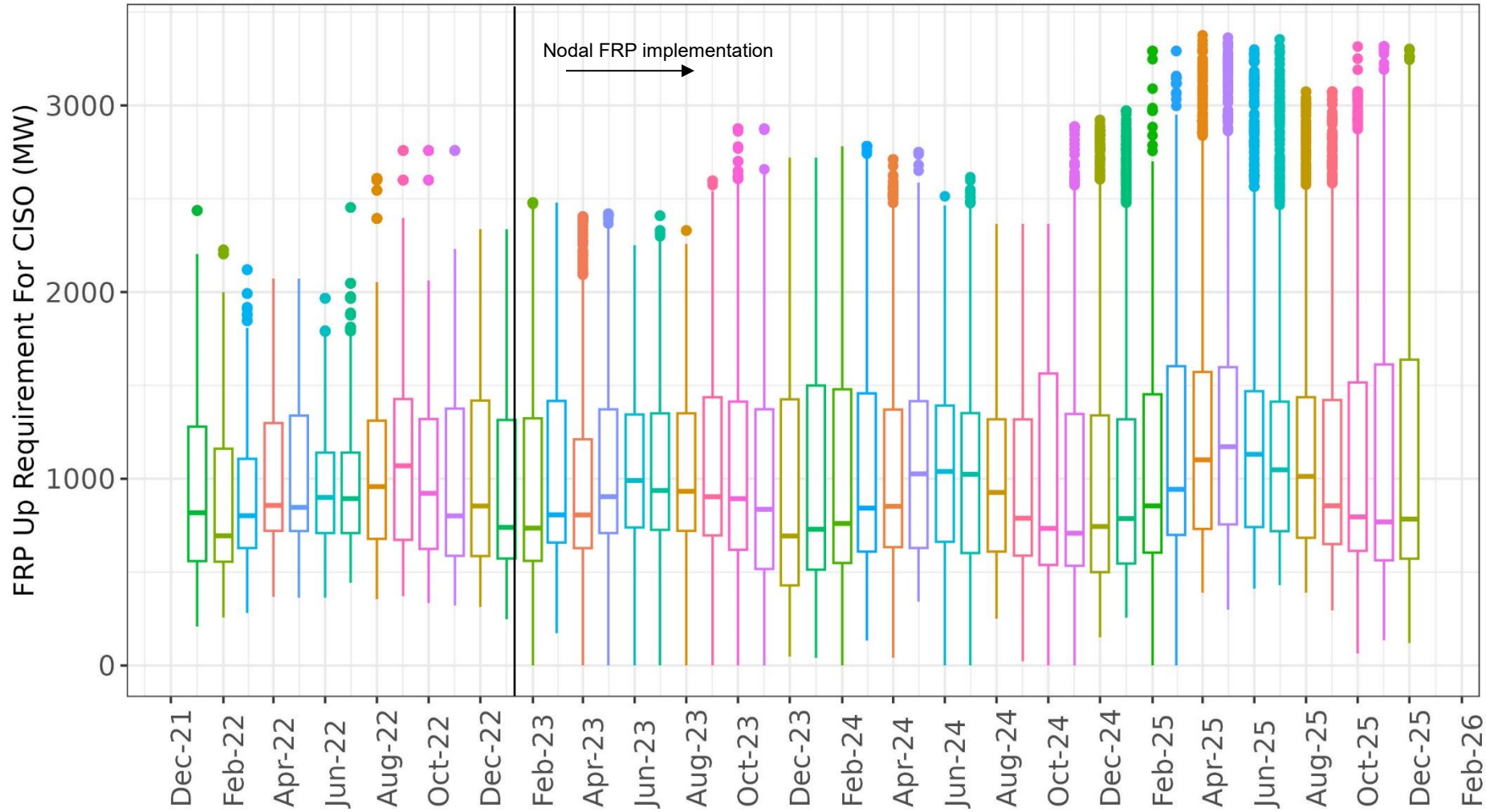


WEIM-related price correction events remain low

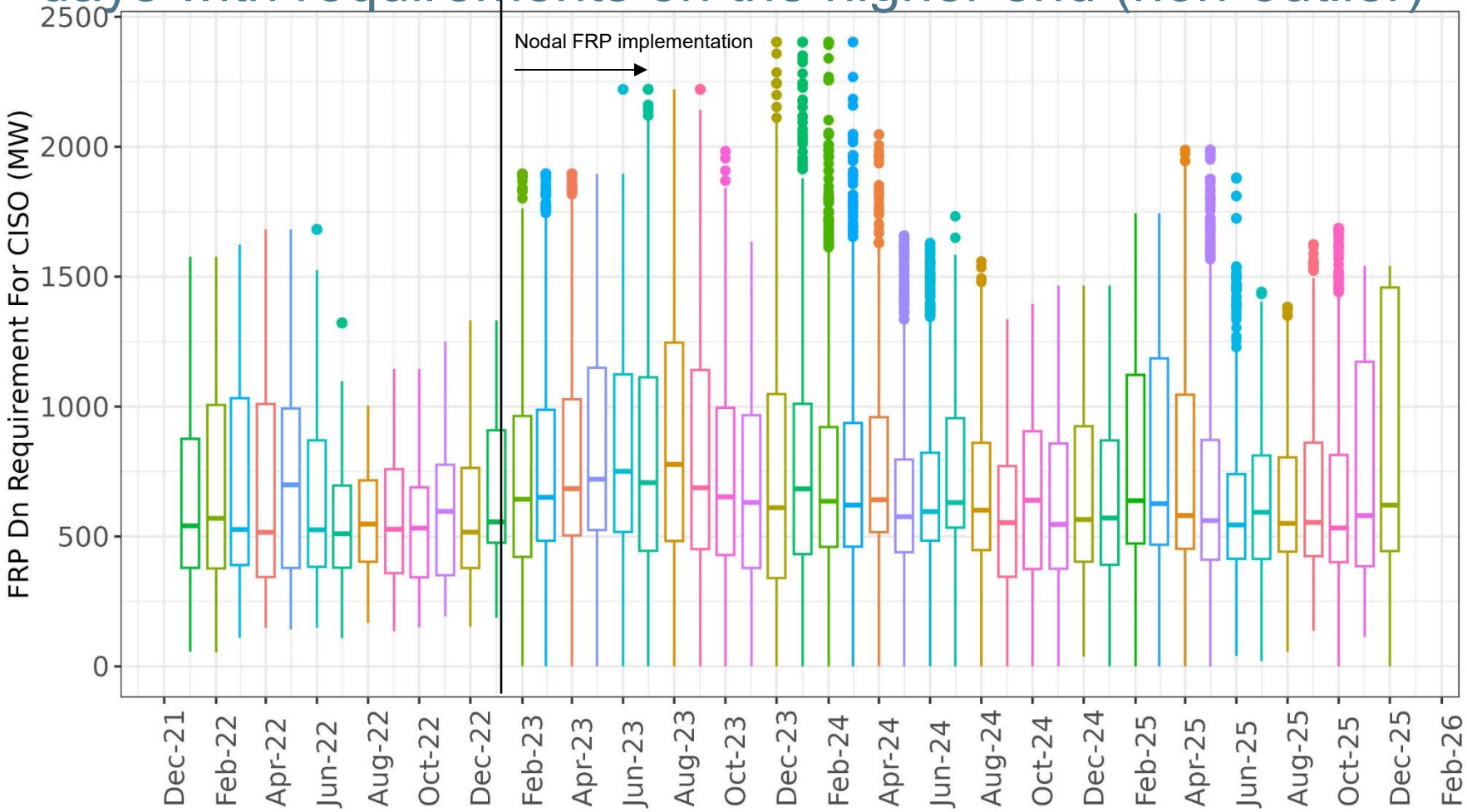


Flexible Ramping Product

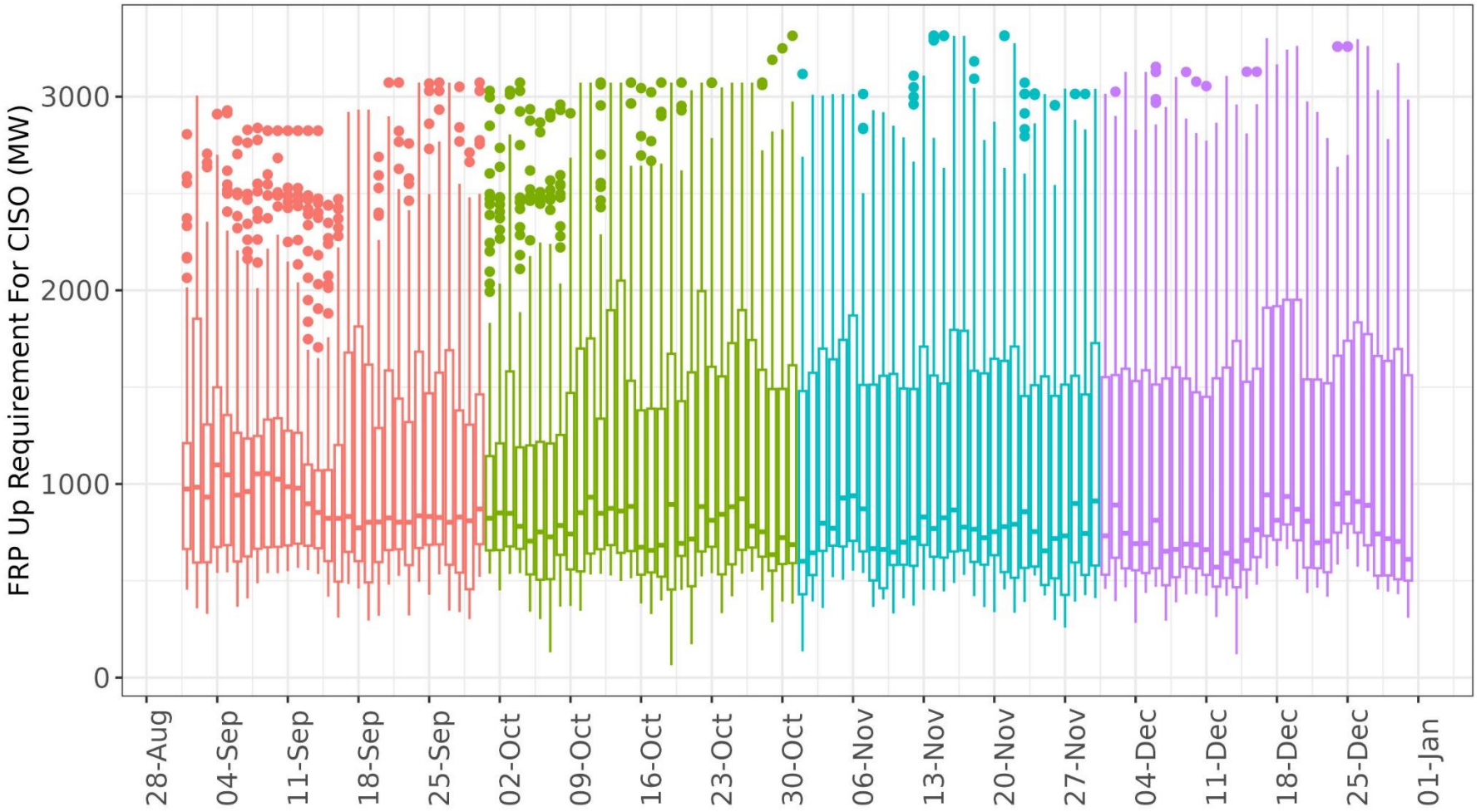
FRP Up Requirement for CAISO area remain within typical ranges but there were more outliers in 2025



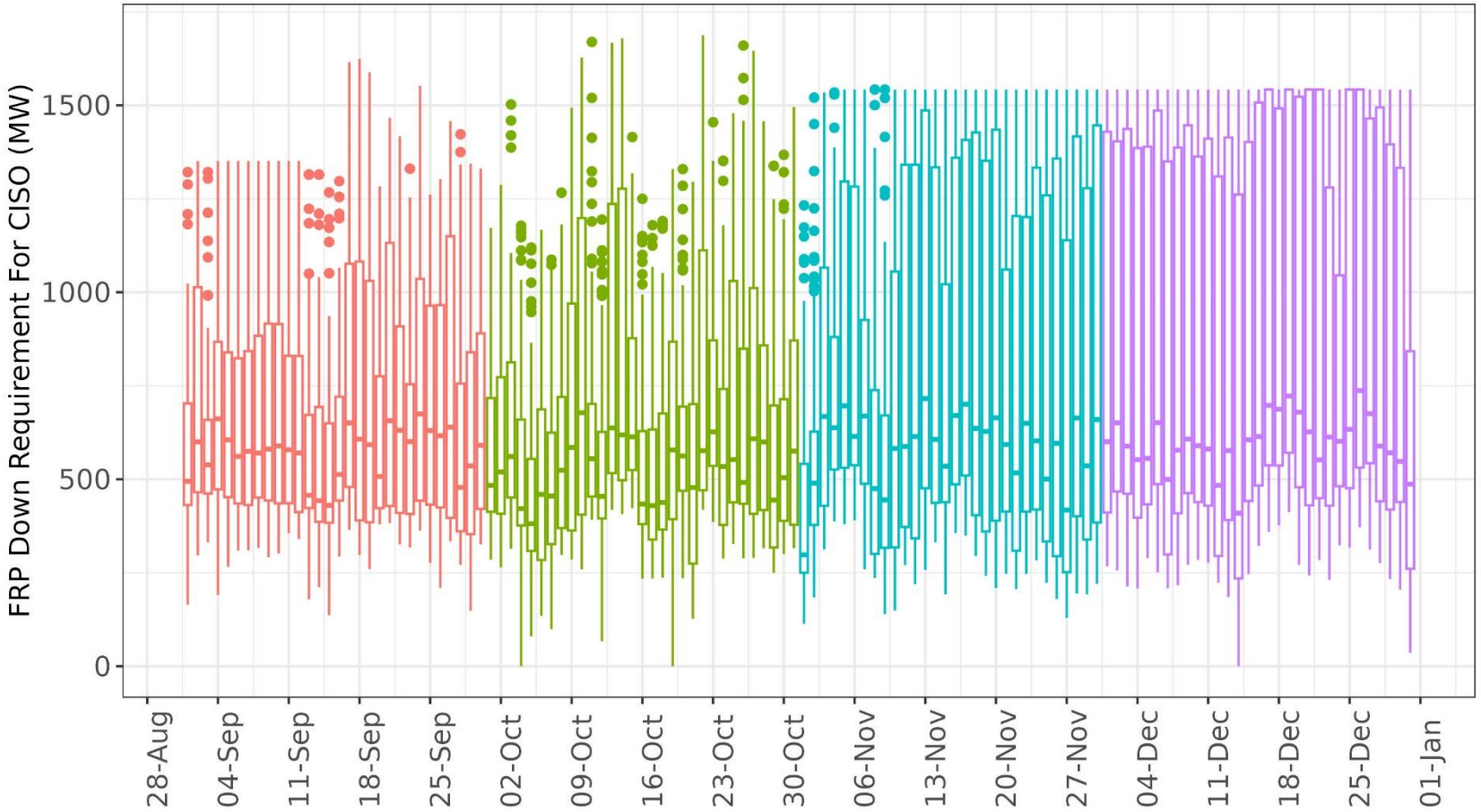
Ranges are typical for FRP Down Requirement for CAISO area but November and December had more days with requirements on the higher end (non-outlier)



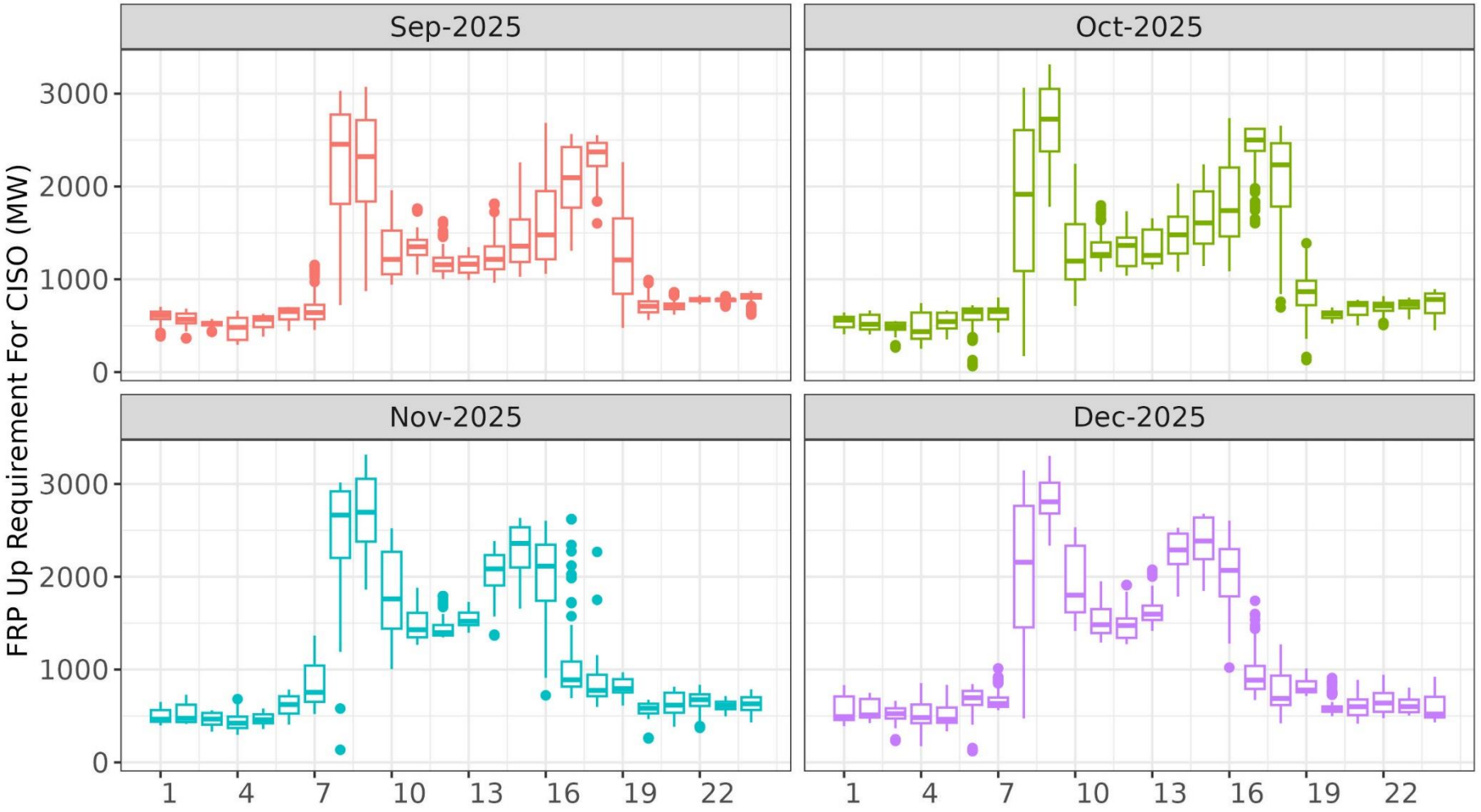
Daily distribution of FRP Up requirement in the last 4 months for CAISO area saw decreases in outliers



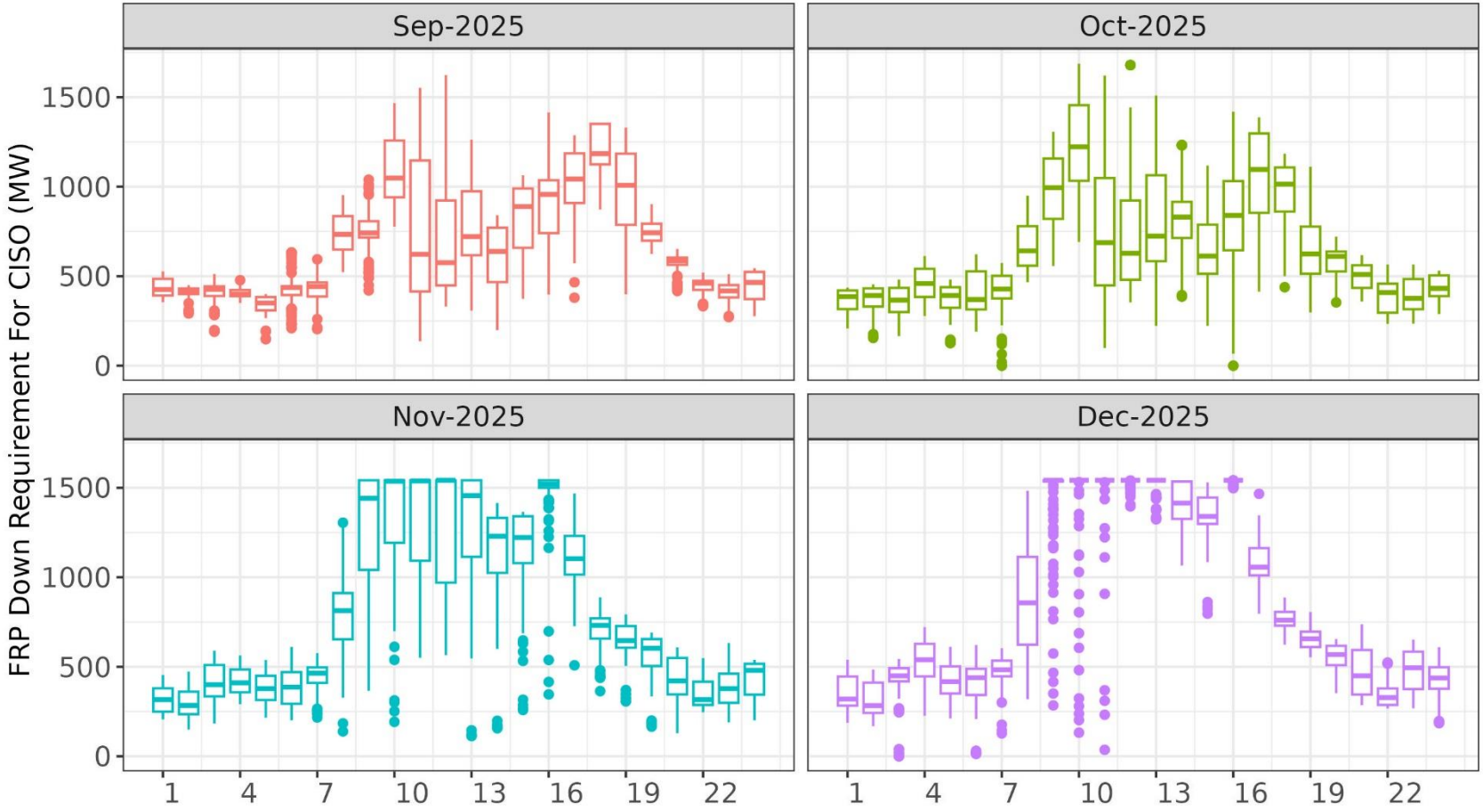
The daily distribution of FRP Down requirement for CAISO area became more skewed in the upward direction in November and December



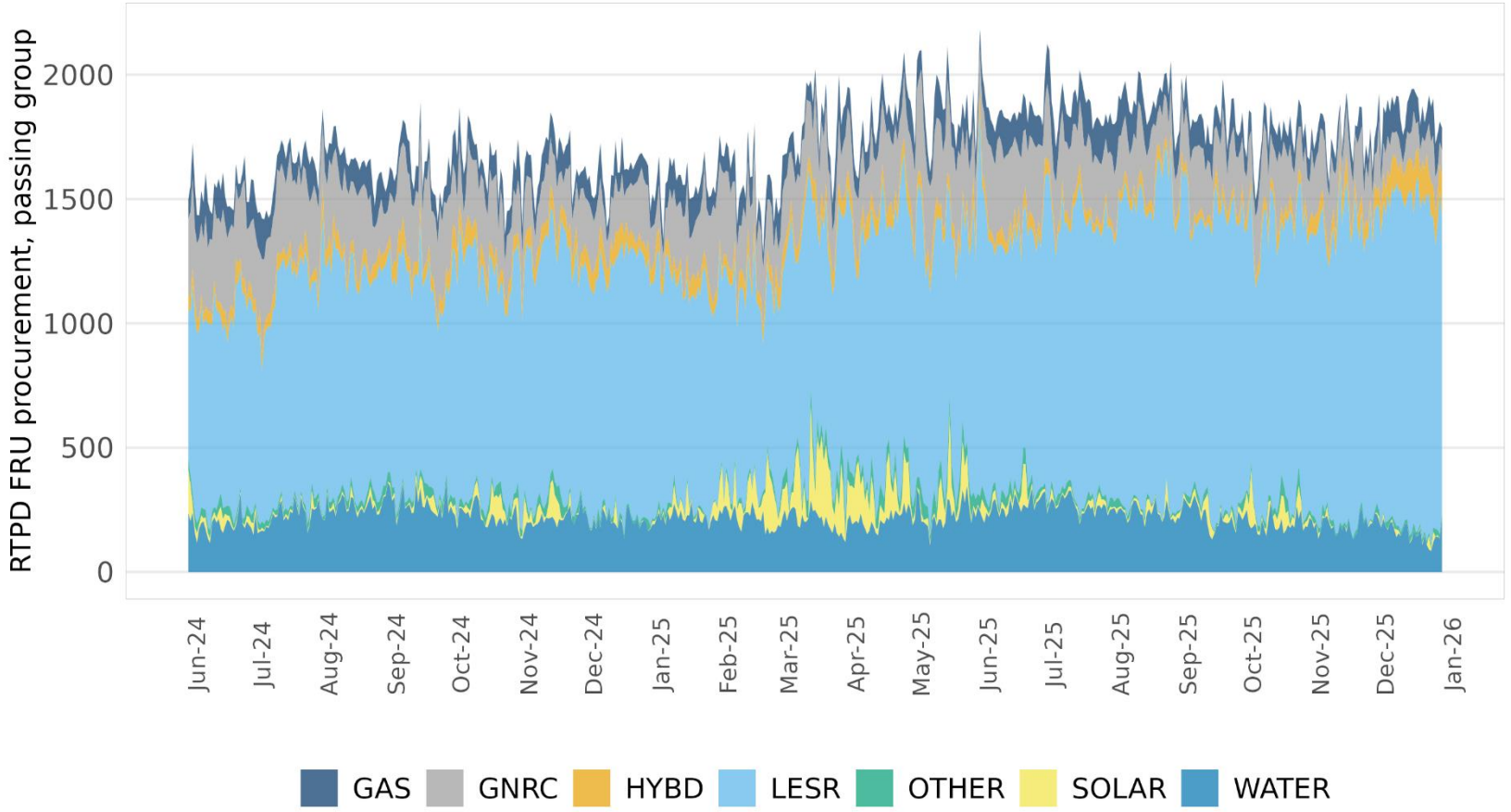
The hourly profile of upward FRP tends to follow a pattern of morning and evening peaks



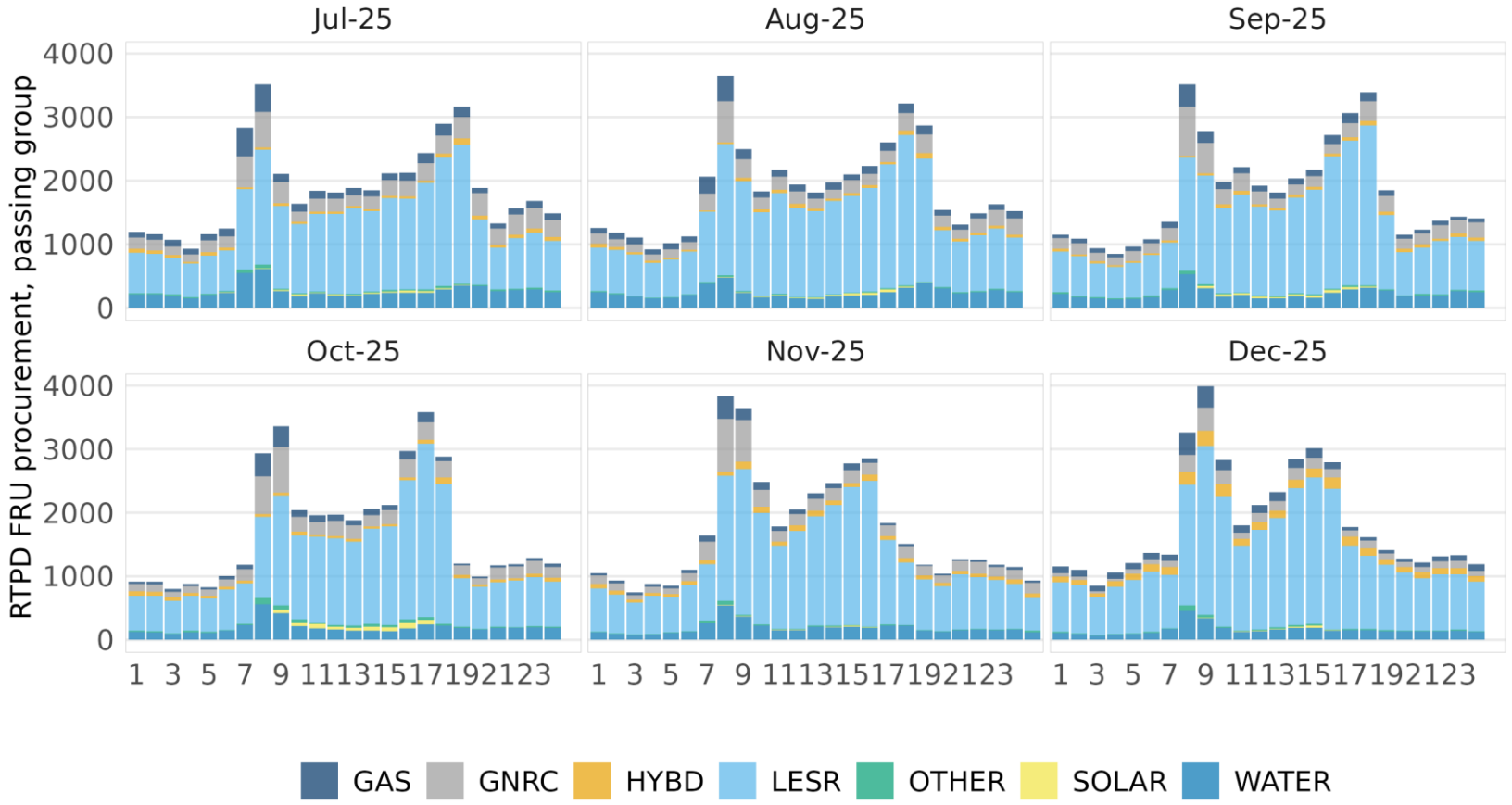
The hourly profile of downward FRP tends to have higher values in midday hours; In November and December the requirement frequently hit the cap of 1542 MW for CISO



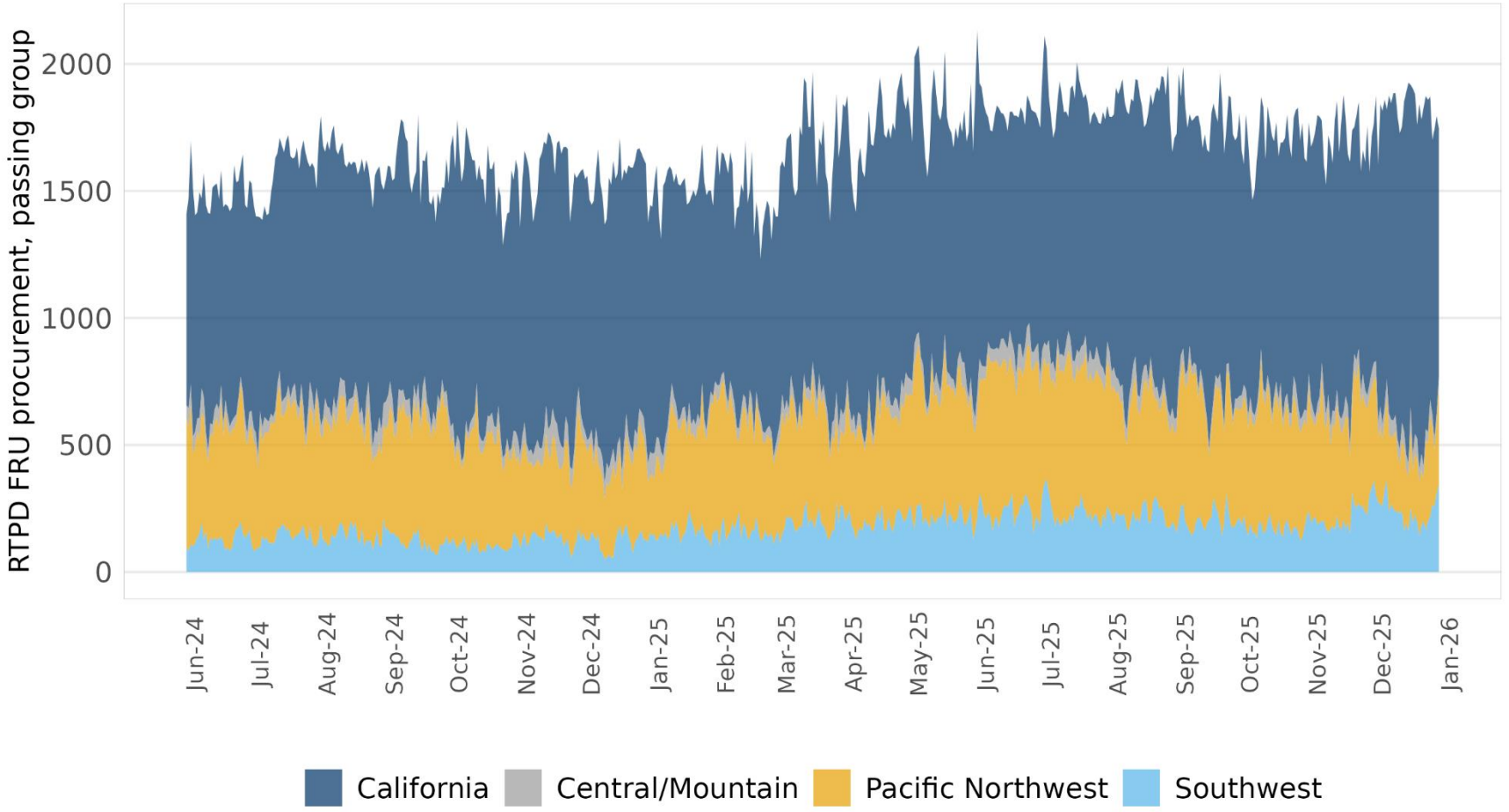
Upward FRP procurement is supported by various types of technologies with the main share coming from storage resources



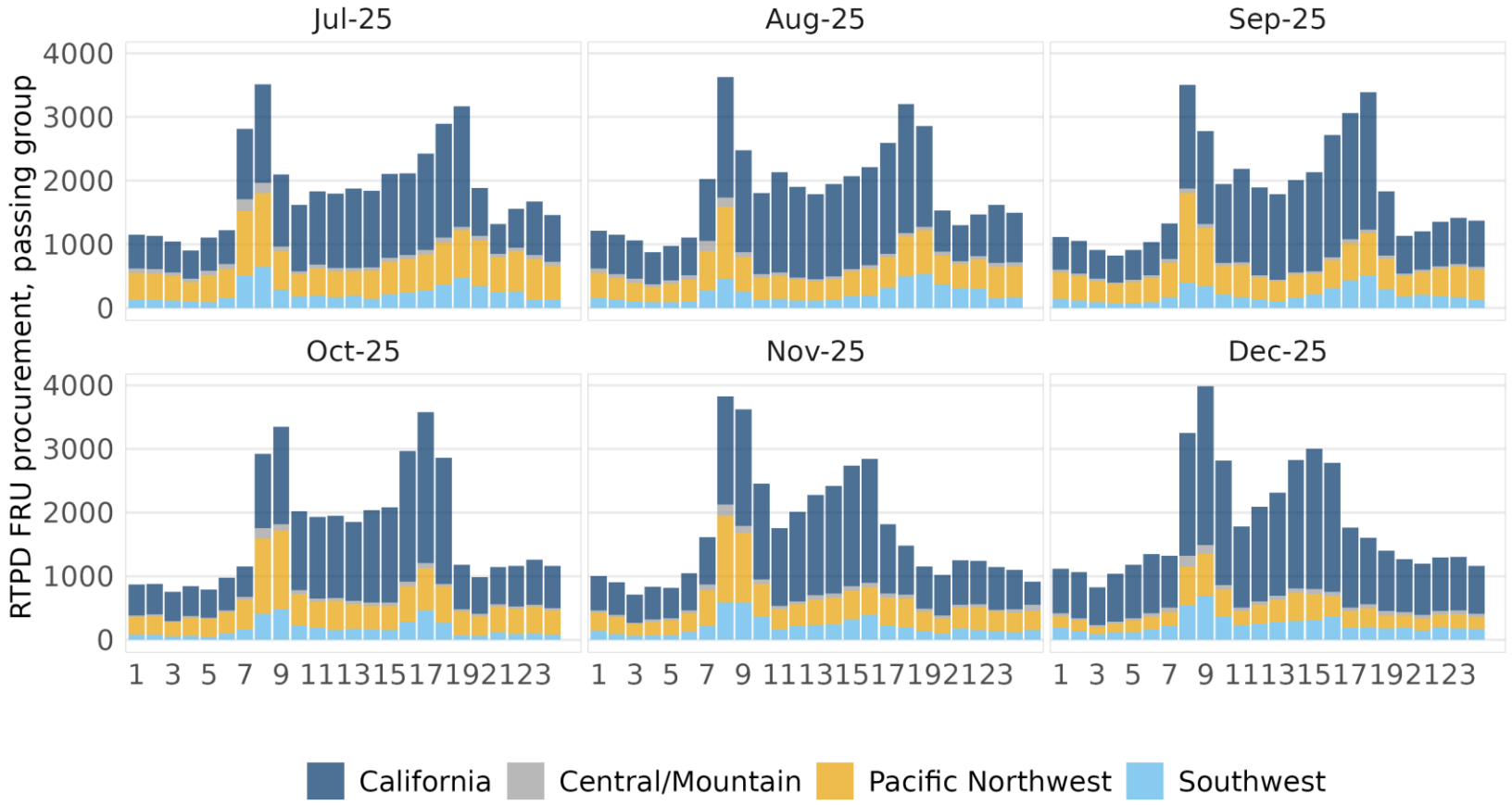
Storage resources tend to support upward FRP procurement throughout the day



Upward FRP is largely procured from areas in the Pacific Northwest and California

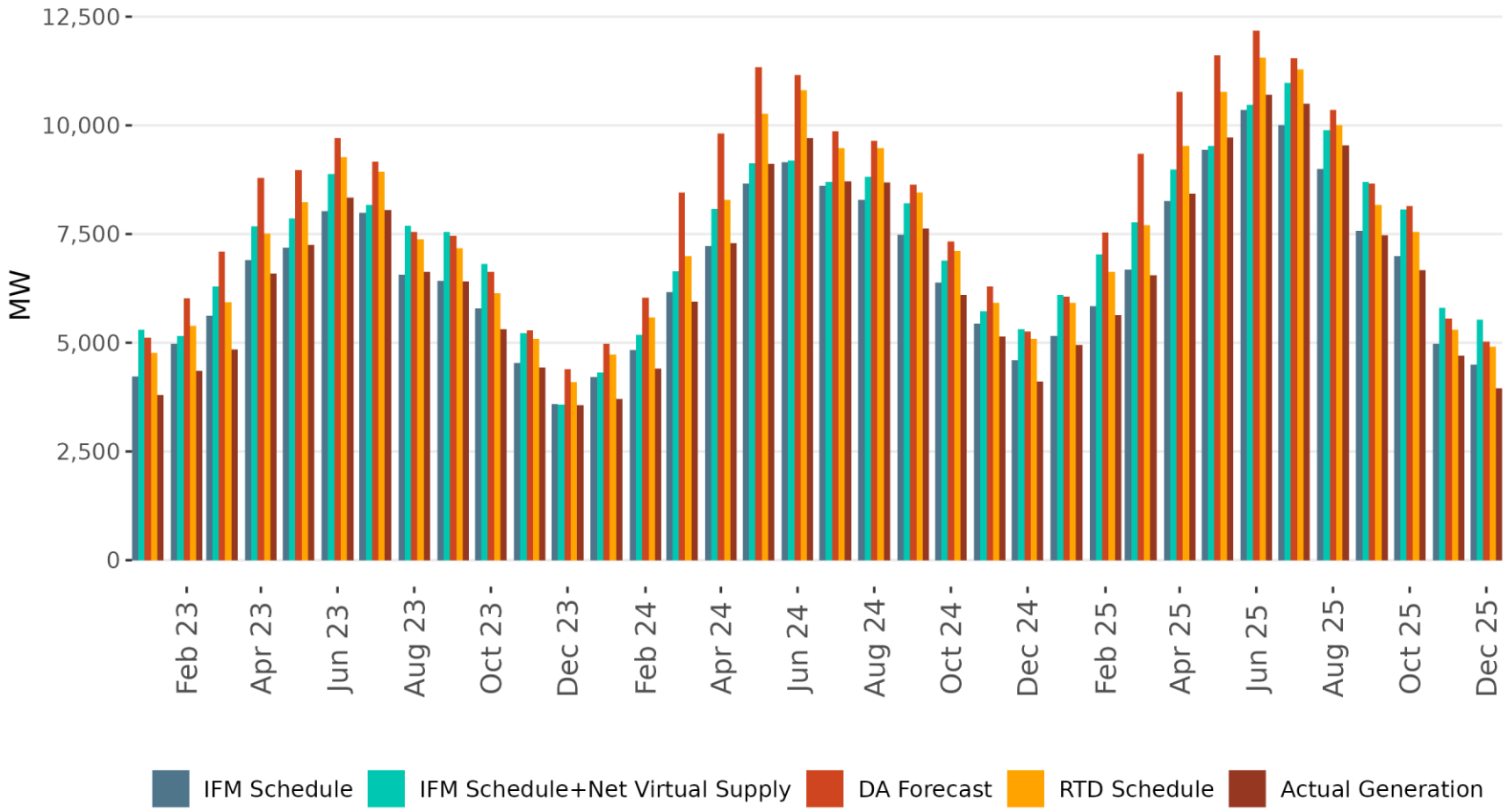


Upward FRP procurement from CAISO area is largely occurring in the peak hours

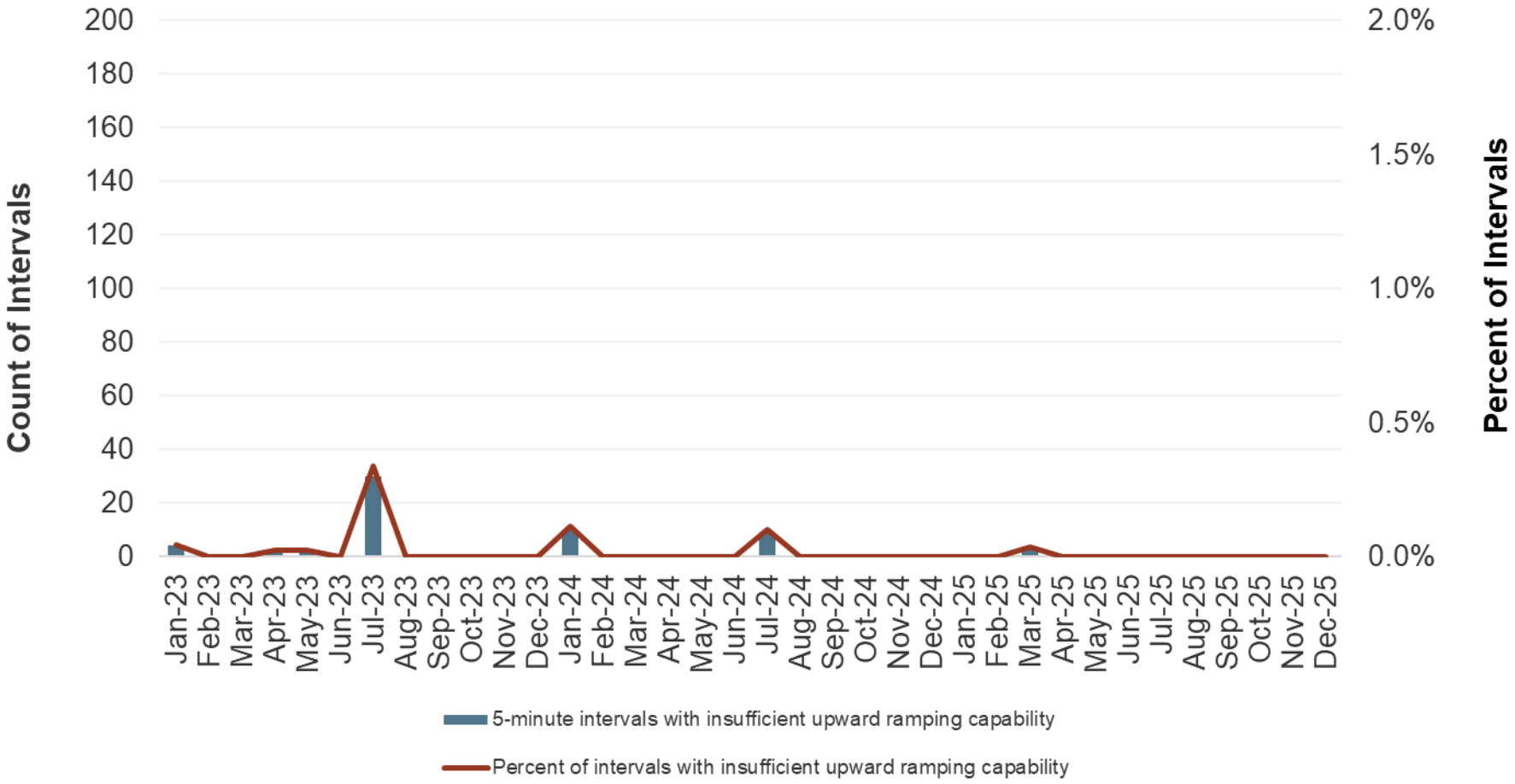


Miscellaneous market metrics

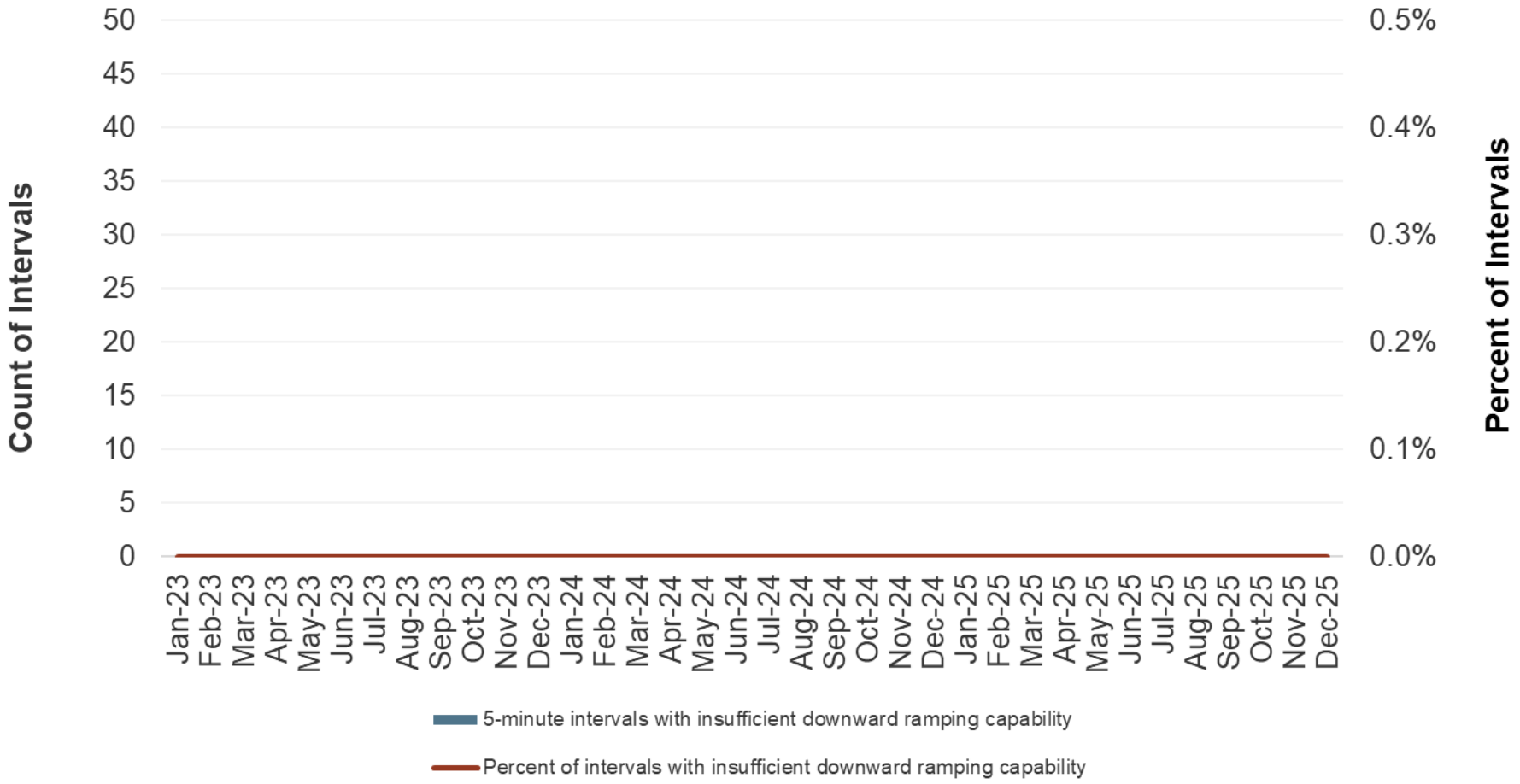
ISO total monthly VERS schedules and forecasts compared to actuals



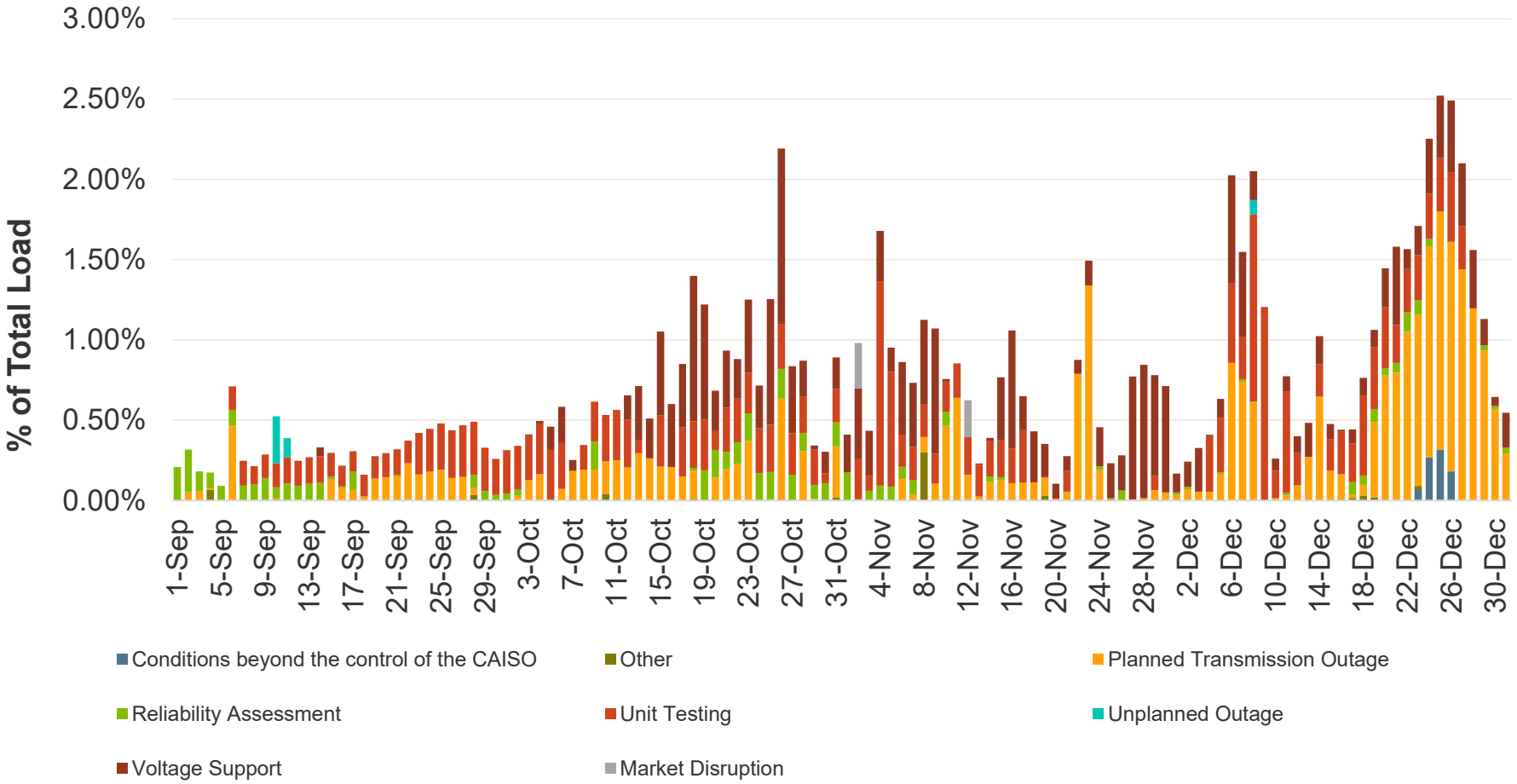
Insufficient upward ramping capacity in ISO real-time stayed at low levels



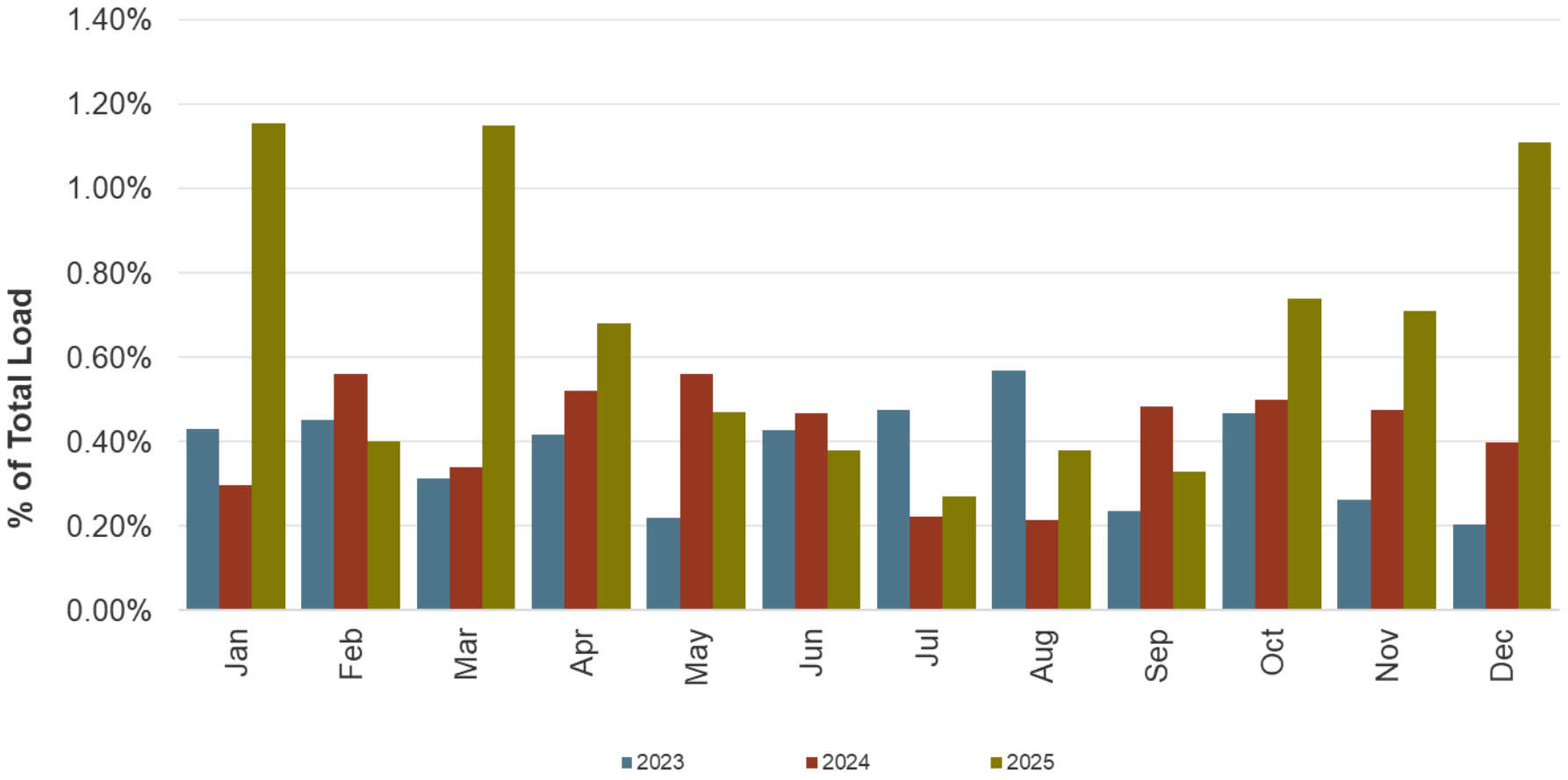
Insufficient downward ramping capacity in real-time remained low



Exceptional dispatches volume is driven by a variety of reasons



Exceptional dispatch volume in the ISO area for Q4 2025 was higher than previous years



Forecasting metrics

Takeaways from STF metrics

Highlights:

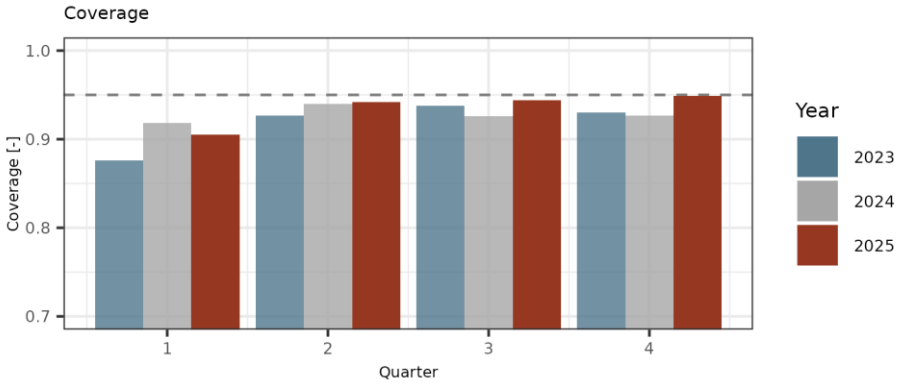
- Real-time accuracy on high load days generally trended well across the WEIM in 2025.
- CAISO DA demand forecast error was relatively high toward the end of 2025. Peak loads tended to be lower than previous years and DA demand forecasts mostly over-predicted peak.
- FRP coverage is near target.

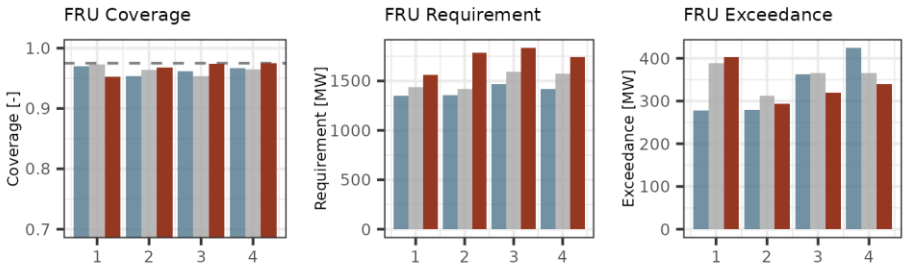
Areas for additional monitoring:

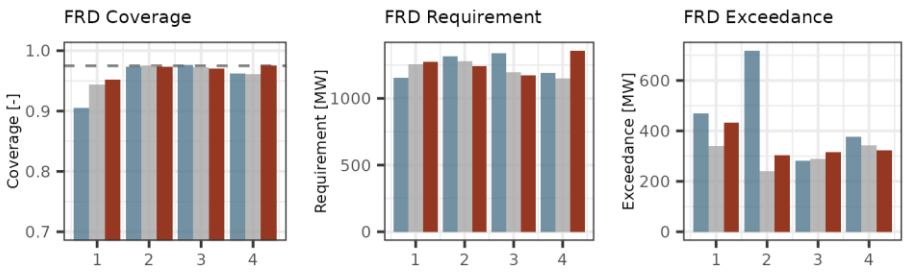
- Capacity-weighted VER forecast metrics generally trend well, but we are working to address MW error, especially in solar ramps.
- Data quality is important to creation of demand forecast and uncertainty products. We are working with entities to review.

FRP Requirements

EIM AREA

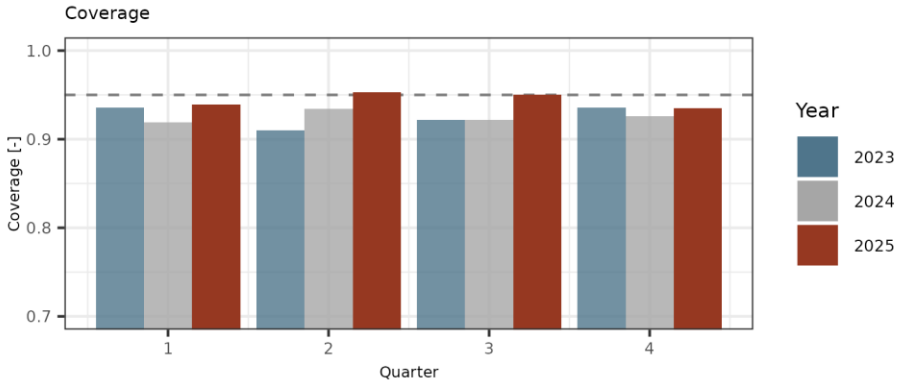


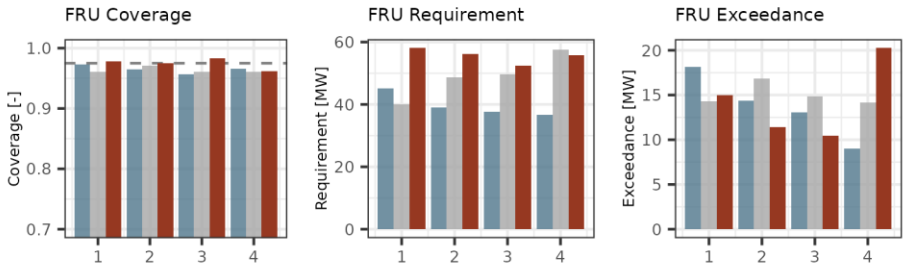


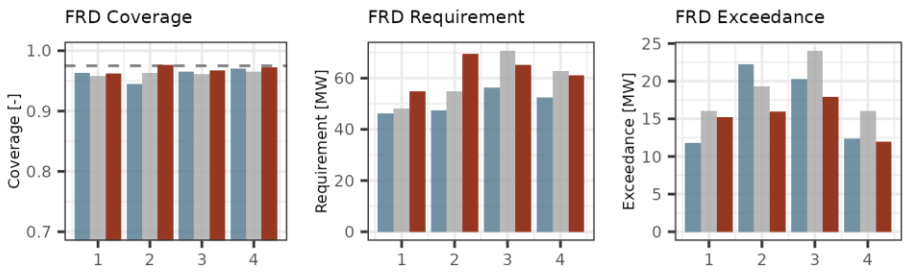


Data current to 2025-12-31

AVA







Data current to 2025-12-31

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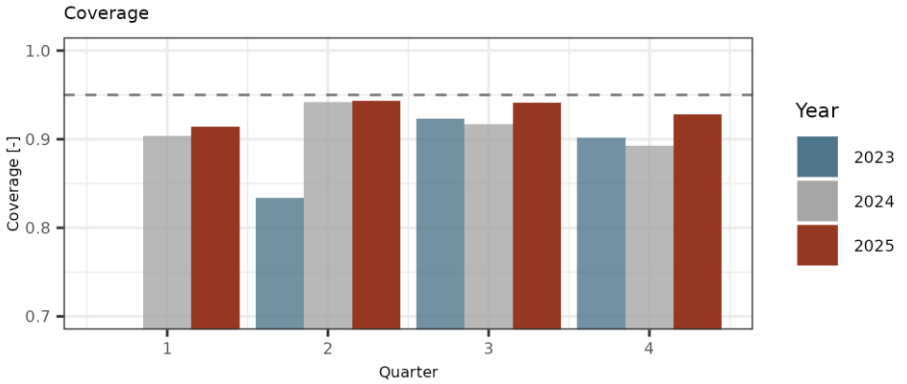

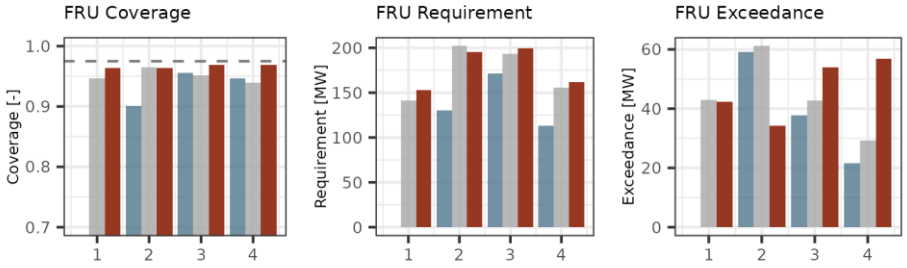

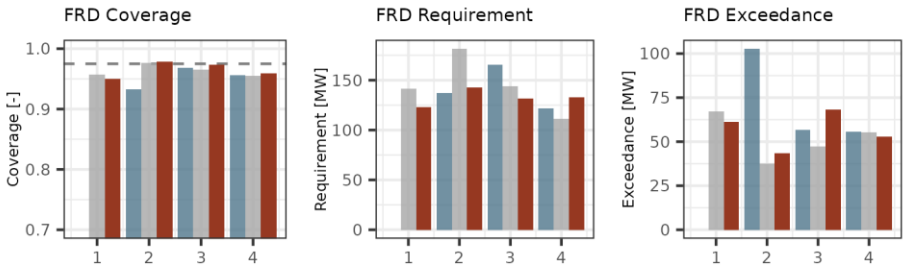

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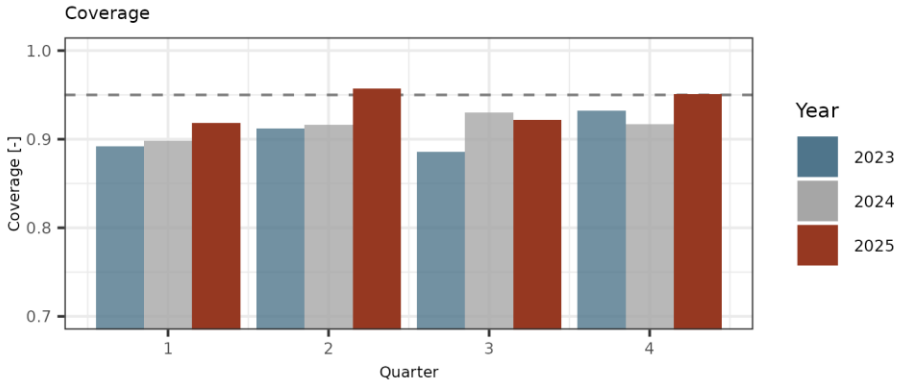

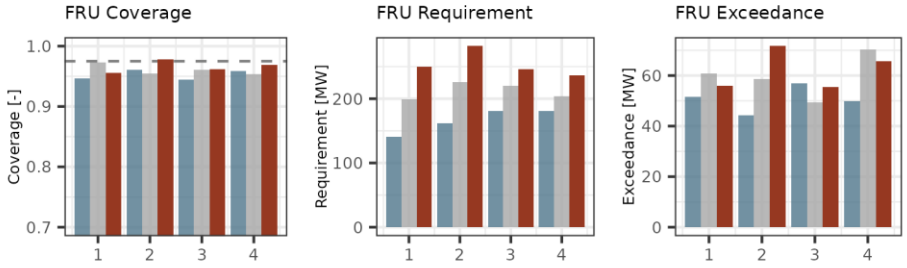

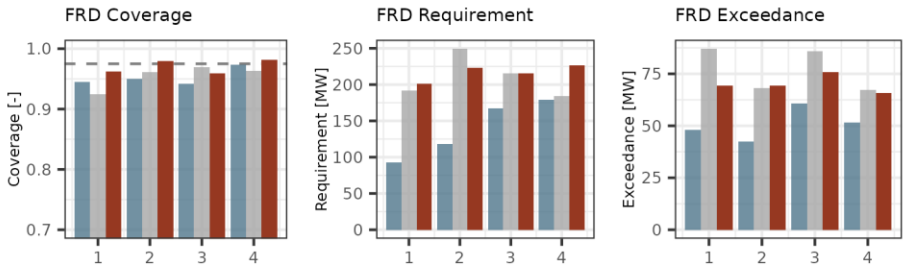

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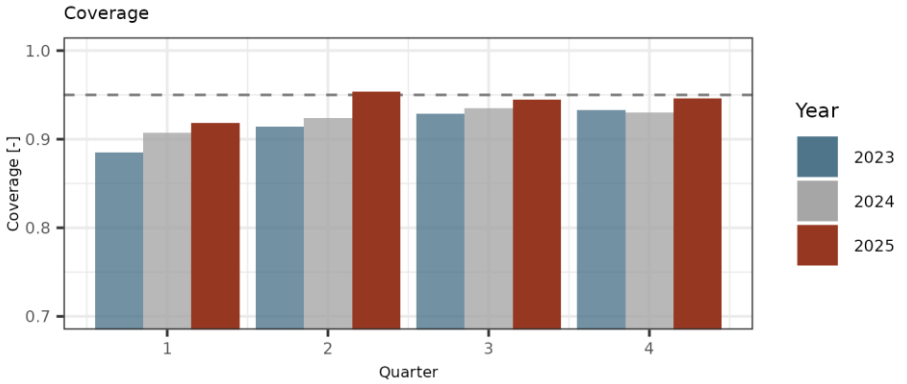

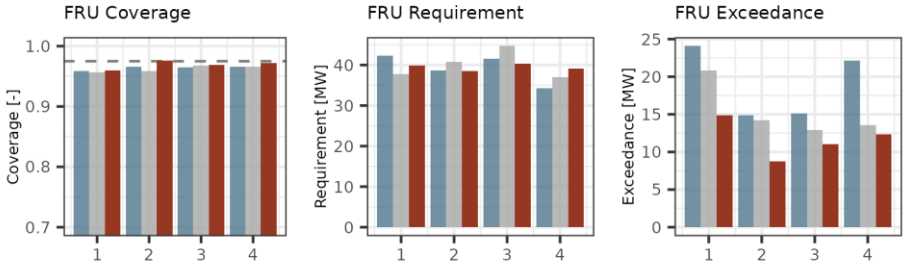

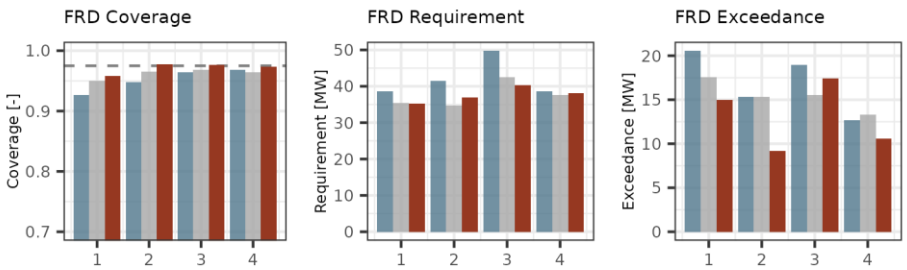

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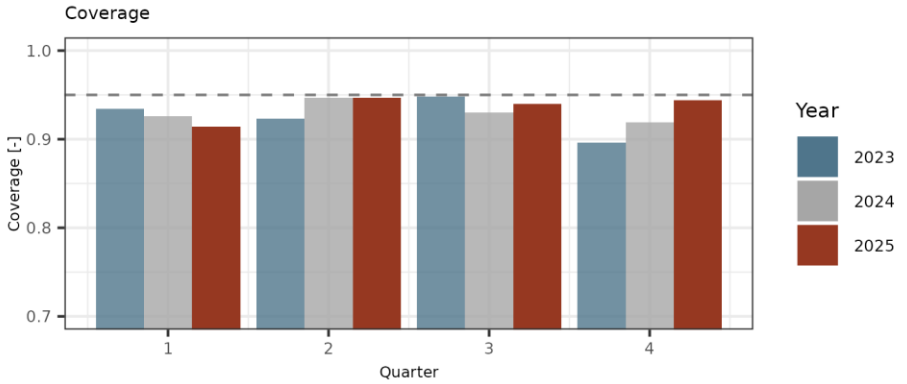

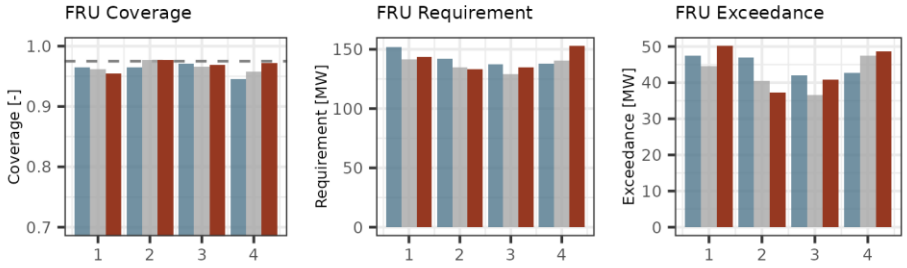

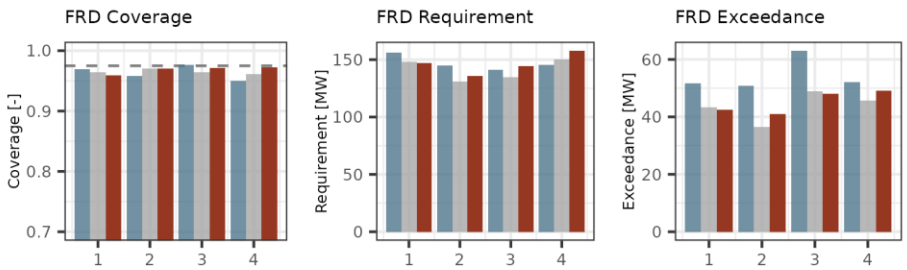

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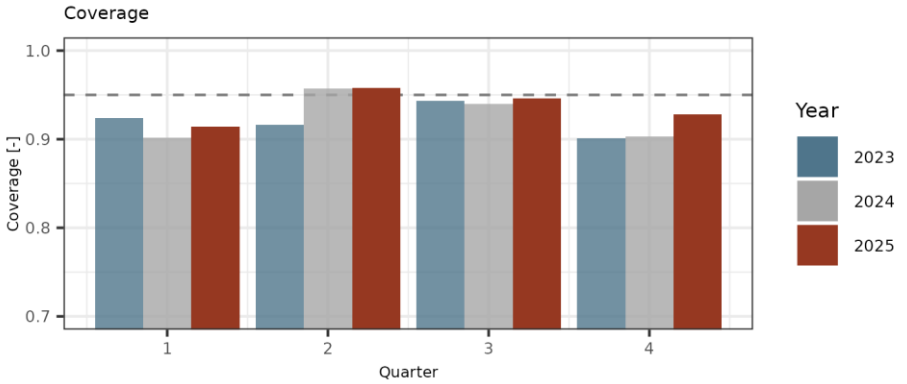
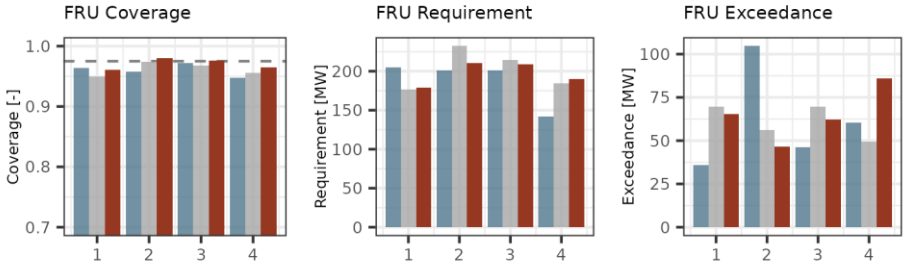
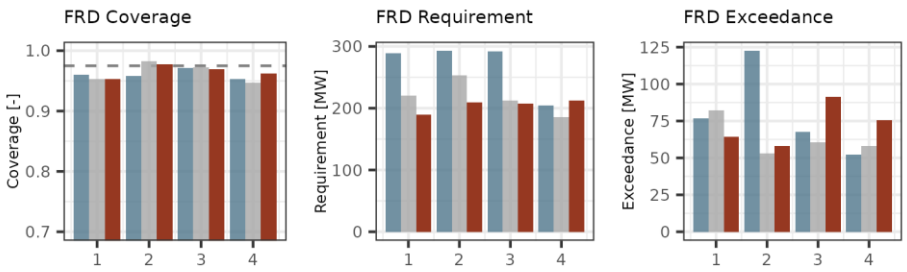
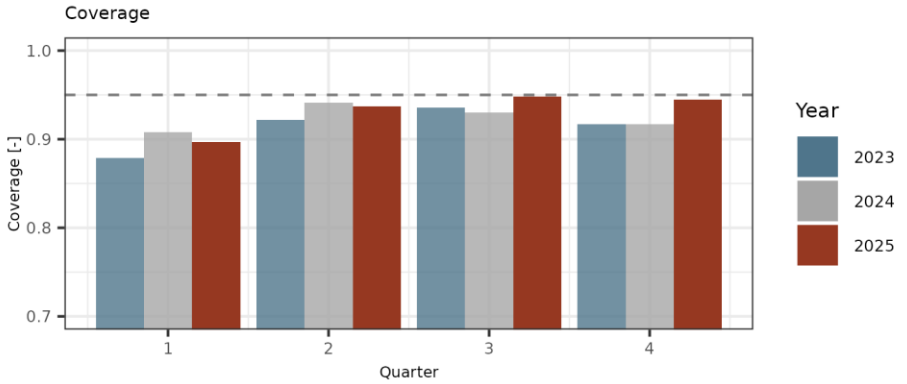


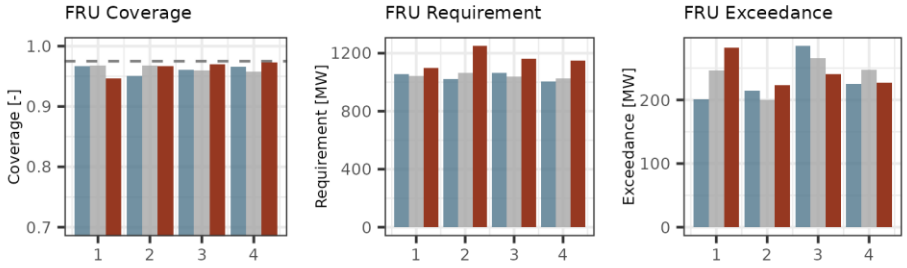


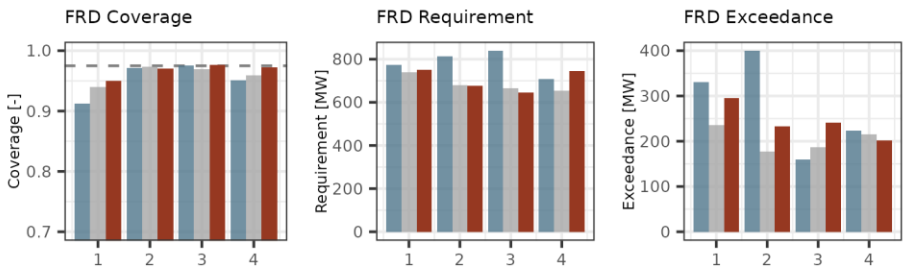


Data current to 2025-12-31

CAISO







Data current to 2025-12-31

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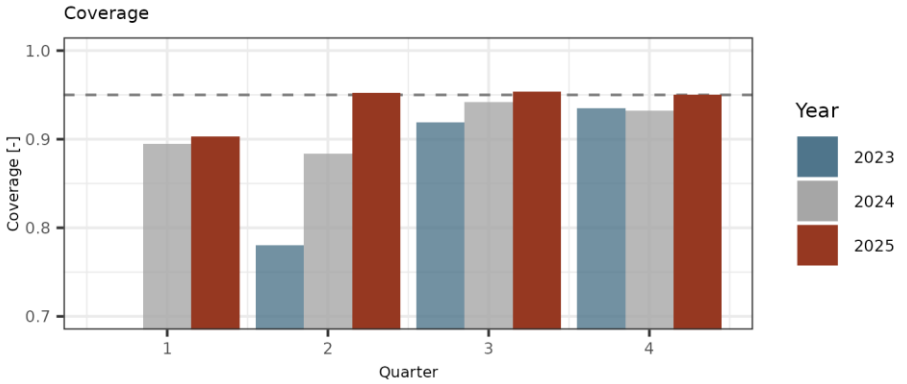
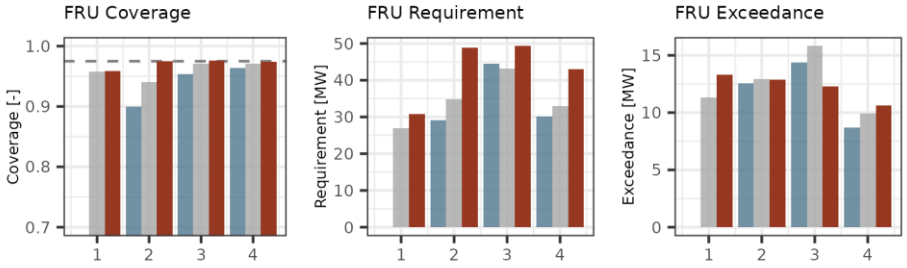
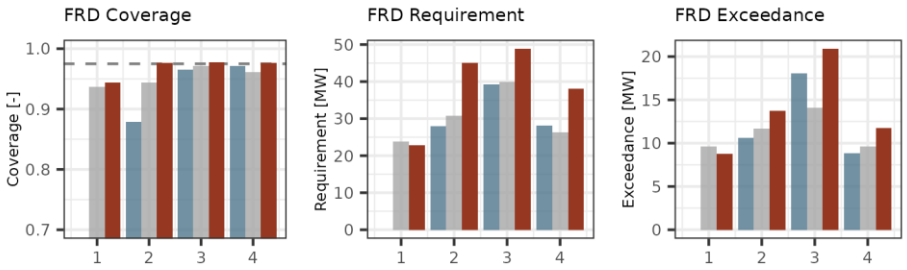
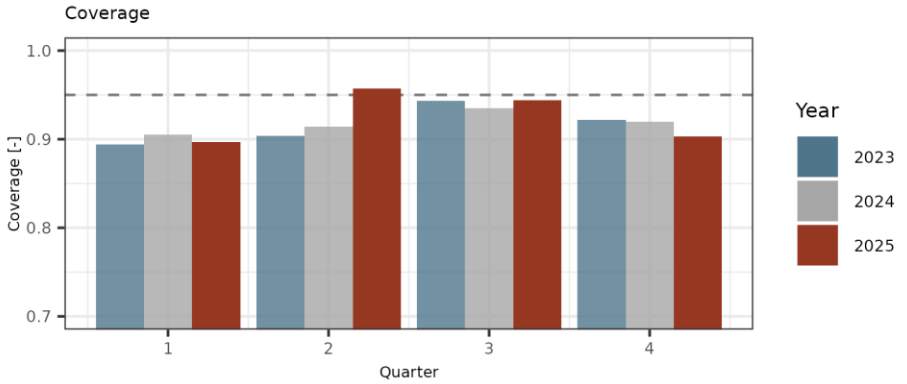


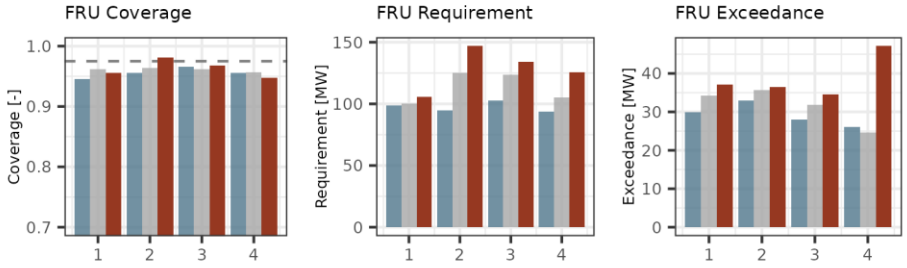


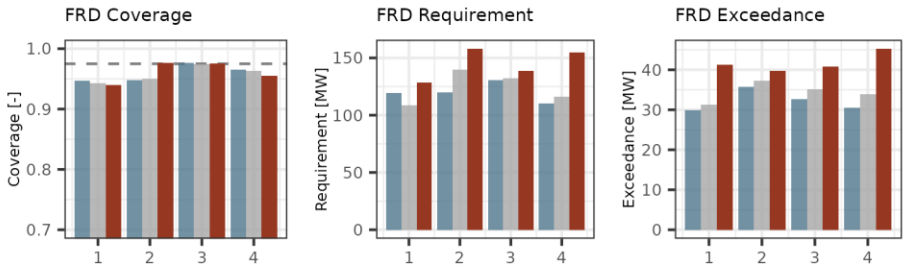


Data current to 2025-12-31

IPCO

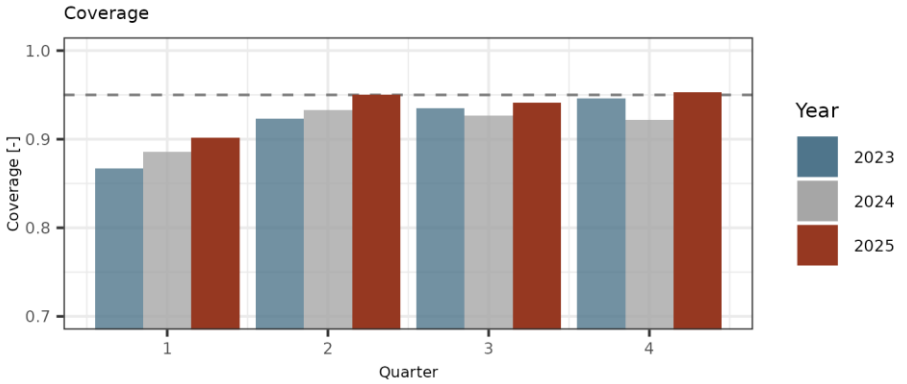


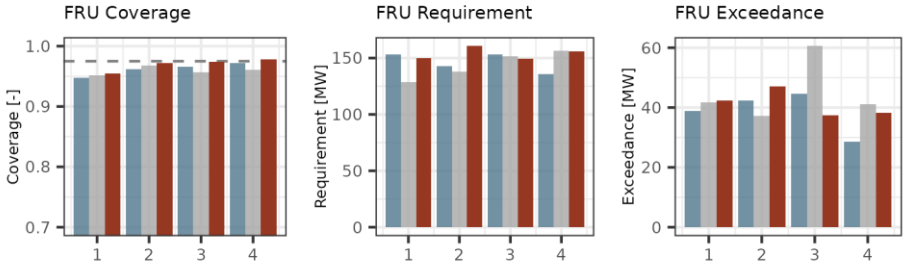


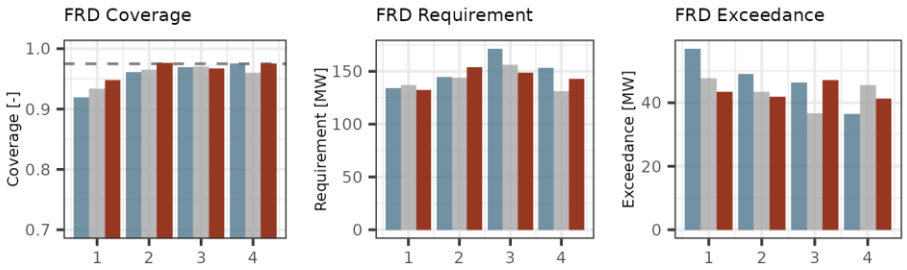


Data current to 2025-12-31

LADWP







Data current to 2025-12-31

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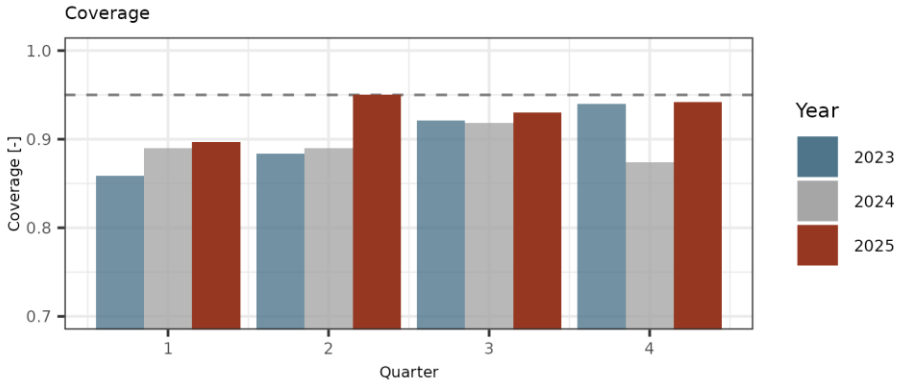
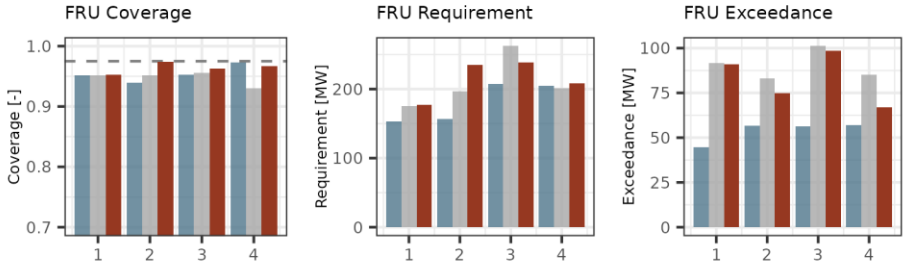
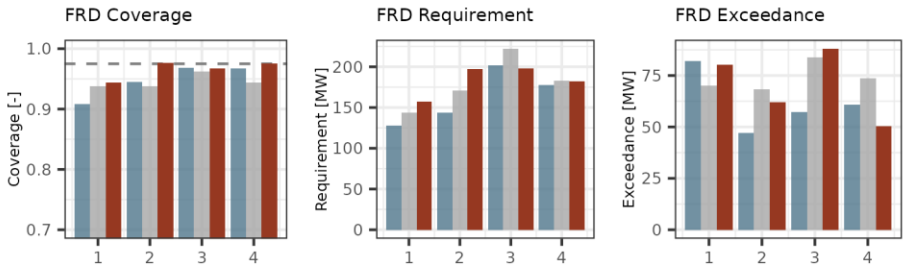
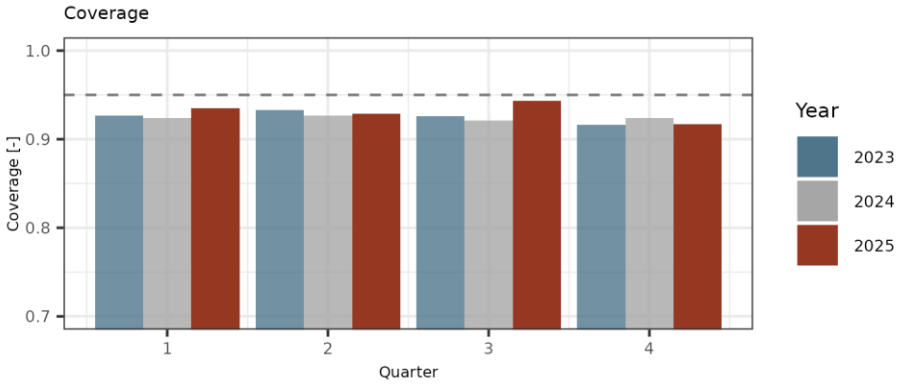


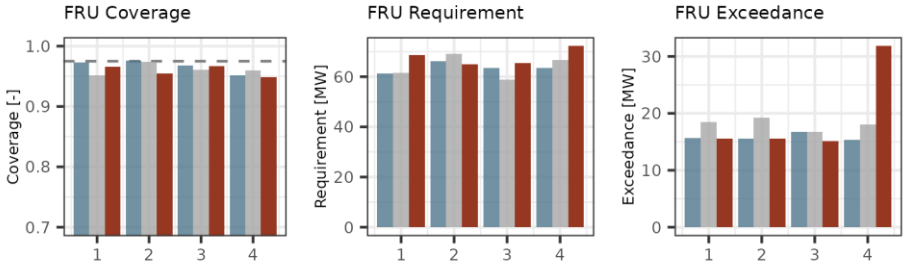


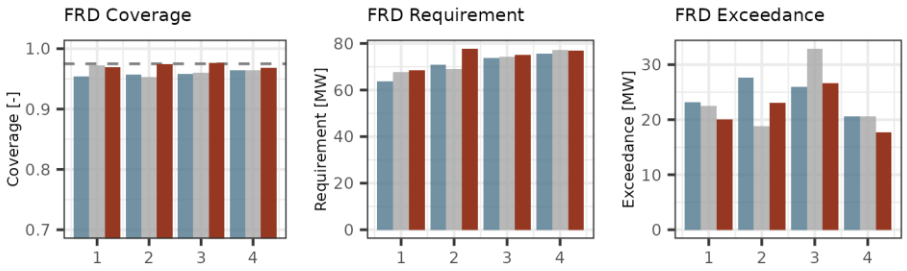


Data current to 2025-12-31

NWMT







Data current to 2025-12-31

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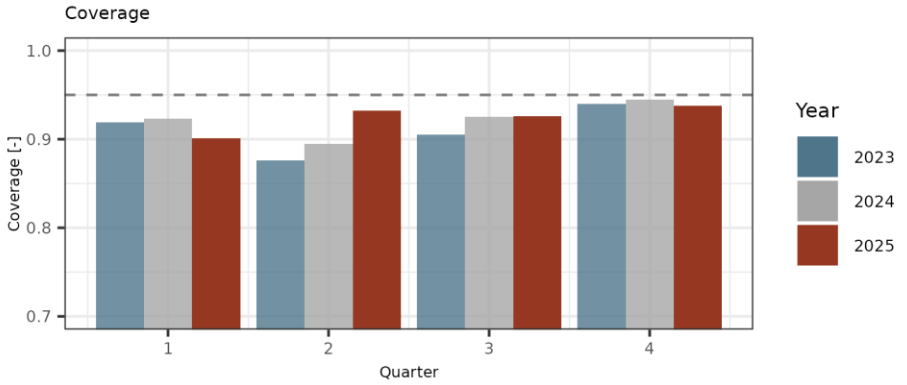

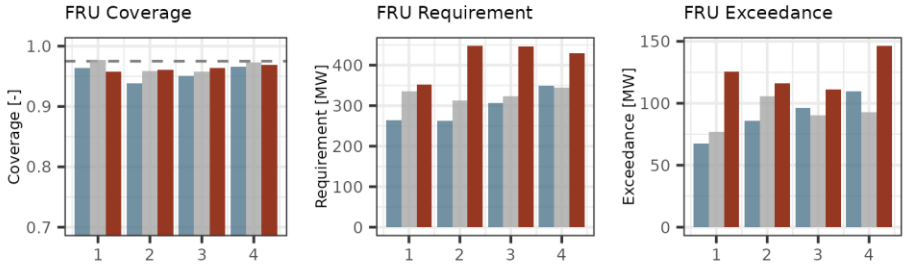

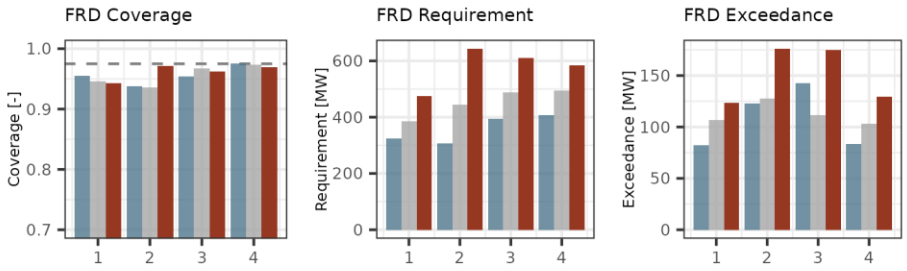

Data current to 2025-12-31

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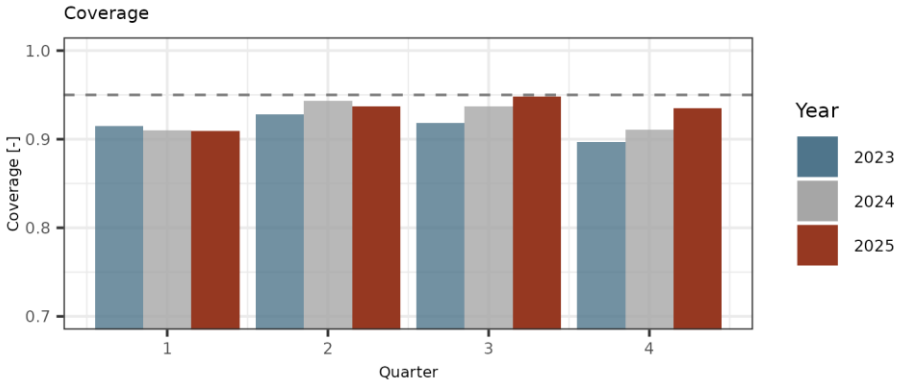

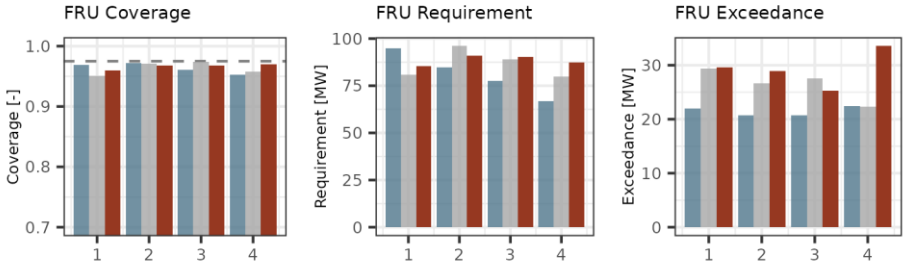

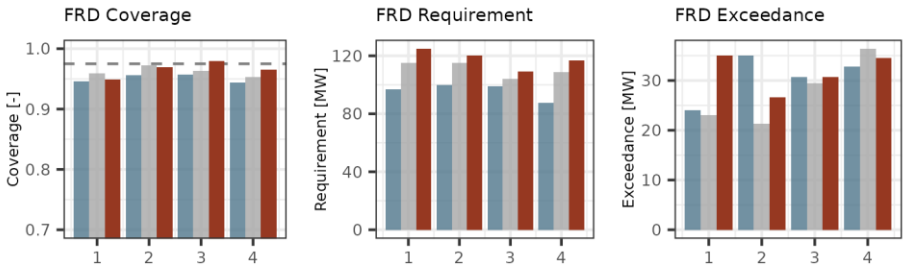

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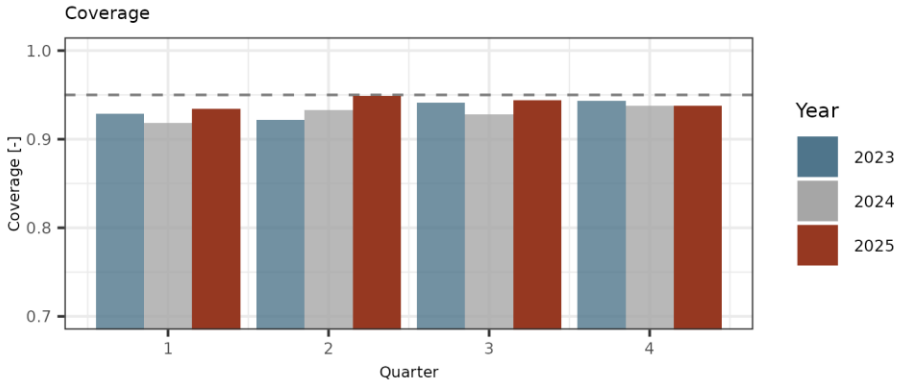
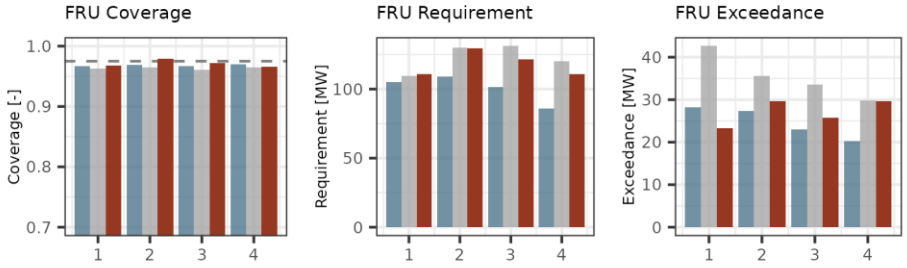
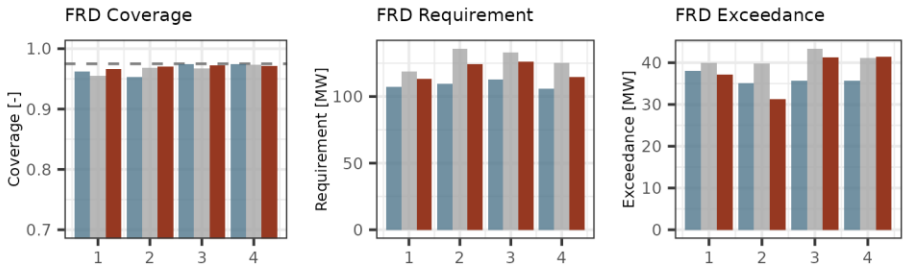
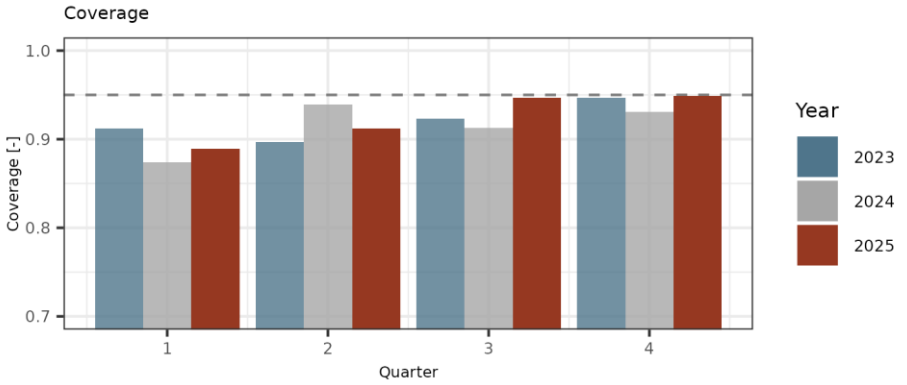


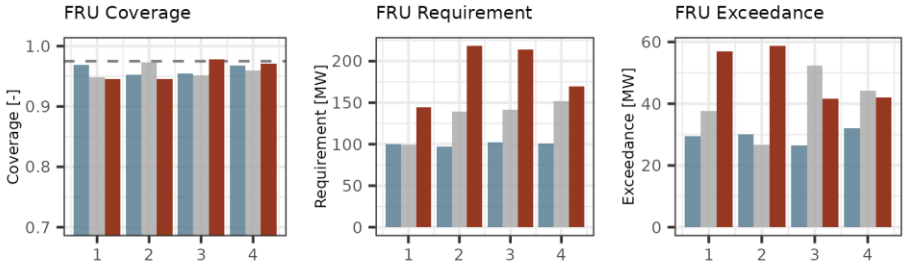


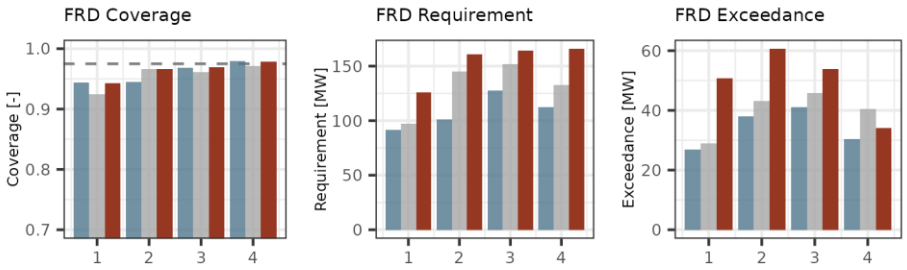


Data current to 2025-12-31

PNM







Data current to 2025-12-31

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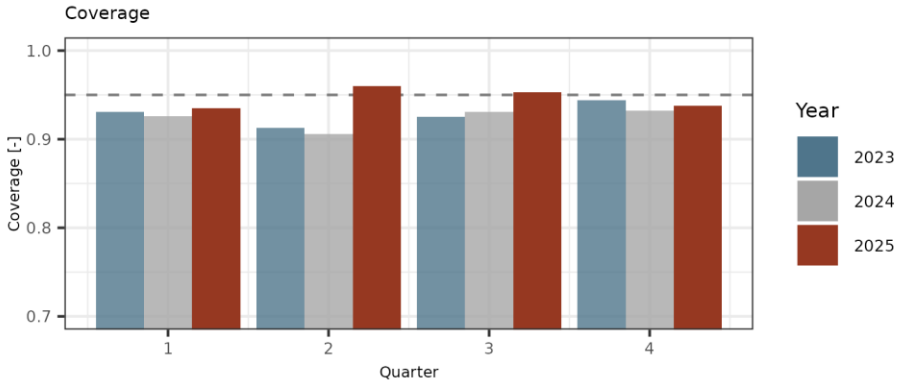
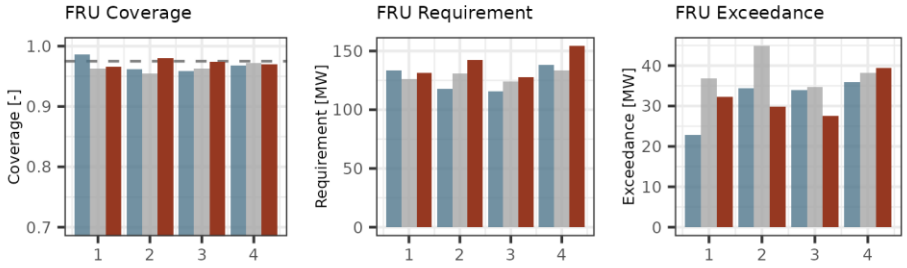
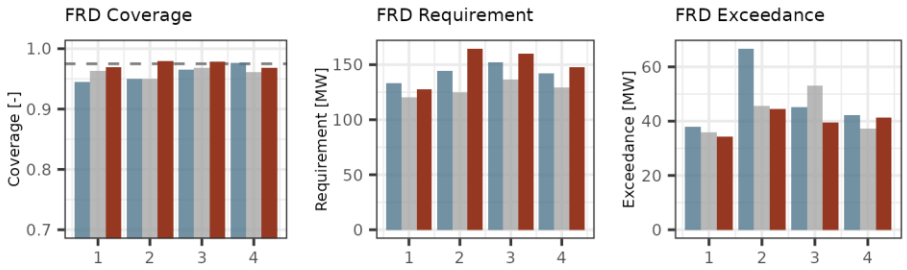
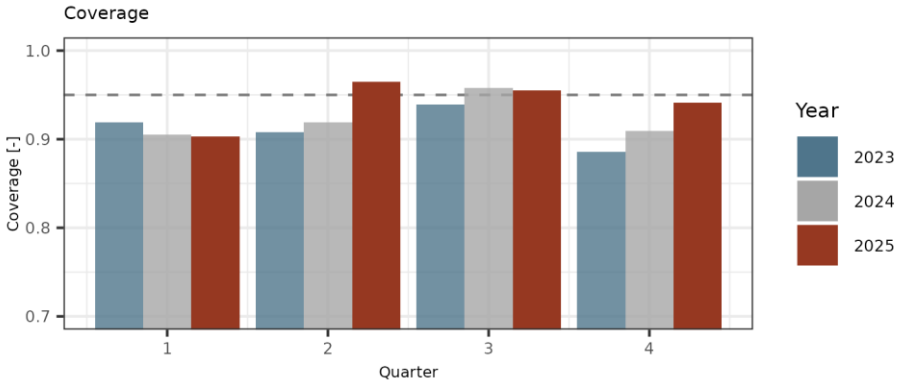


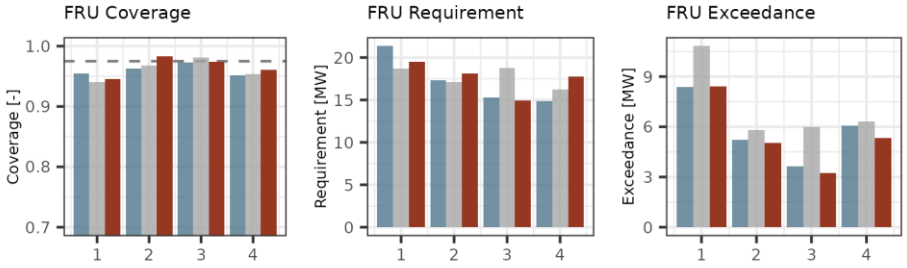


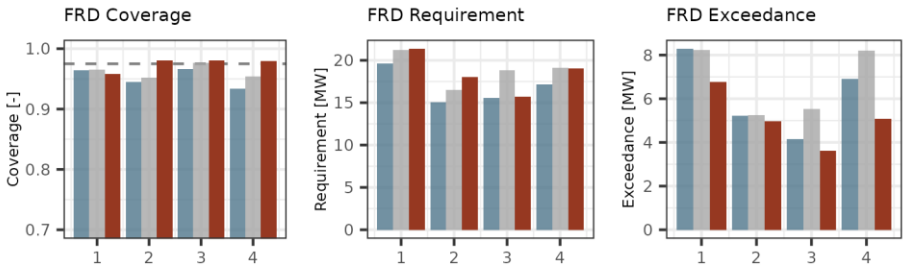


Data current to 2025-12-31

SCL

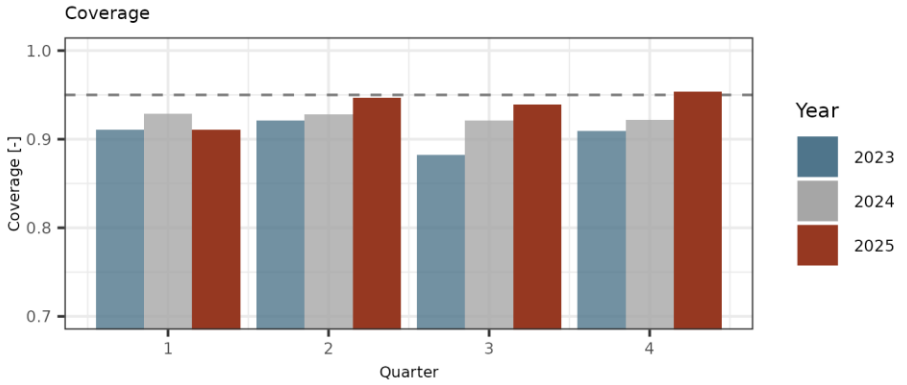


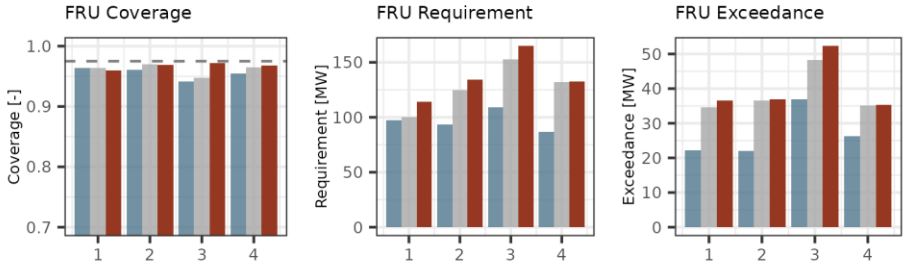


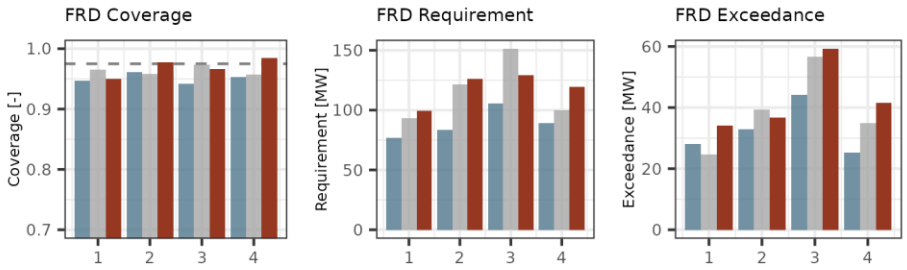


Data current to 2025-12-31

SRP

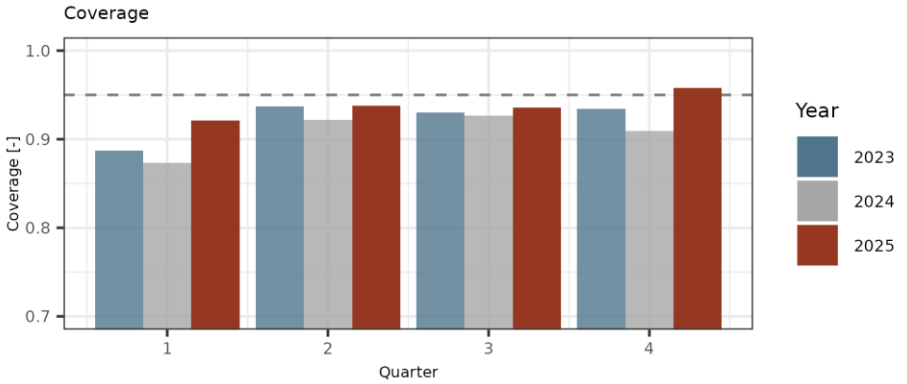


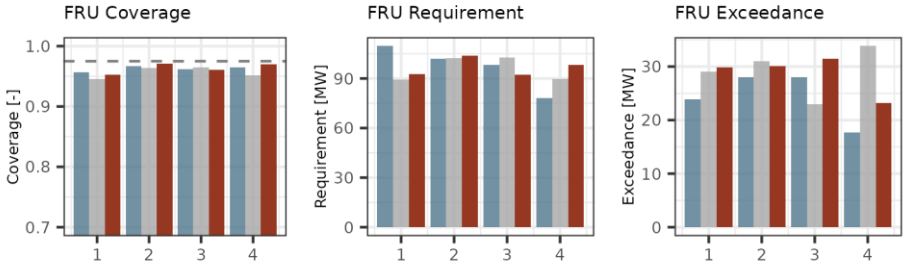


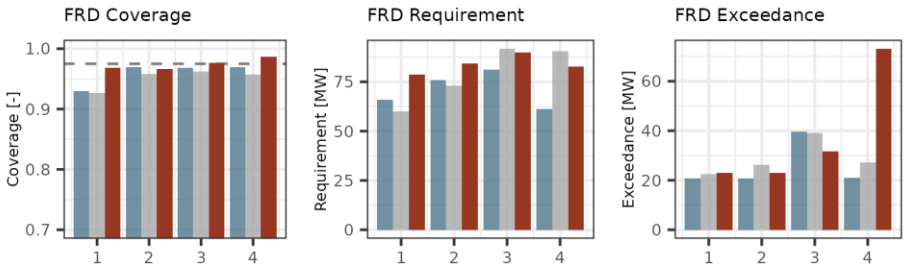


Data current to 2025-12-31

TEP

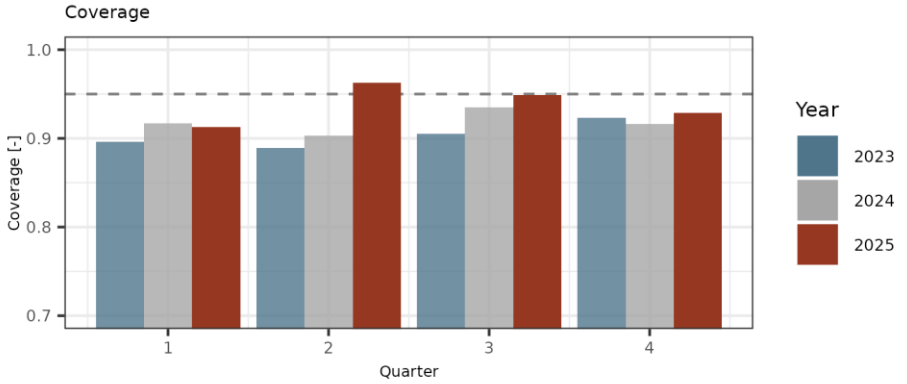


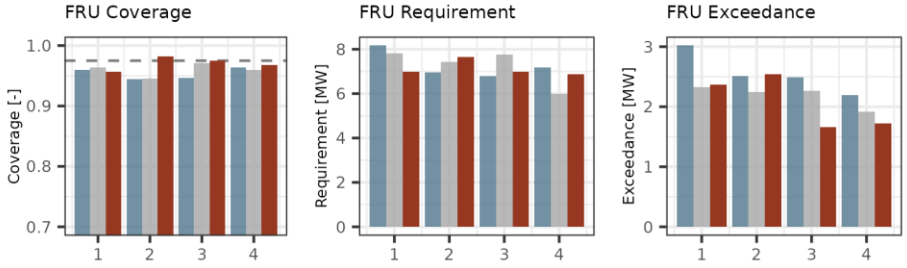


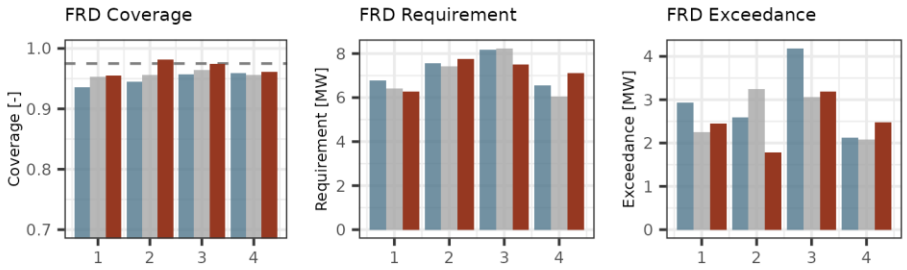


Data current to 2025-12-31

TID



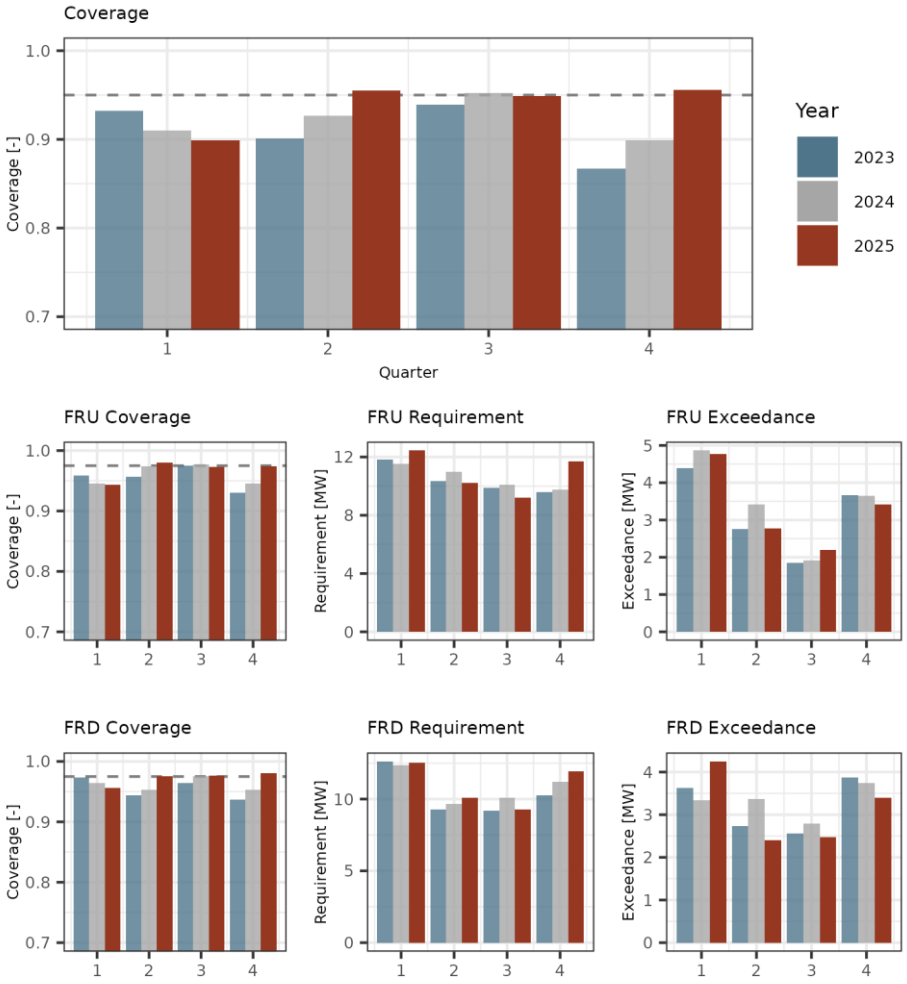




Data current to 2025-12-31

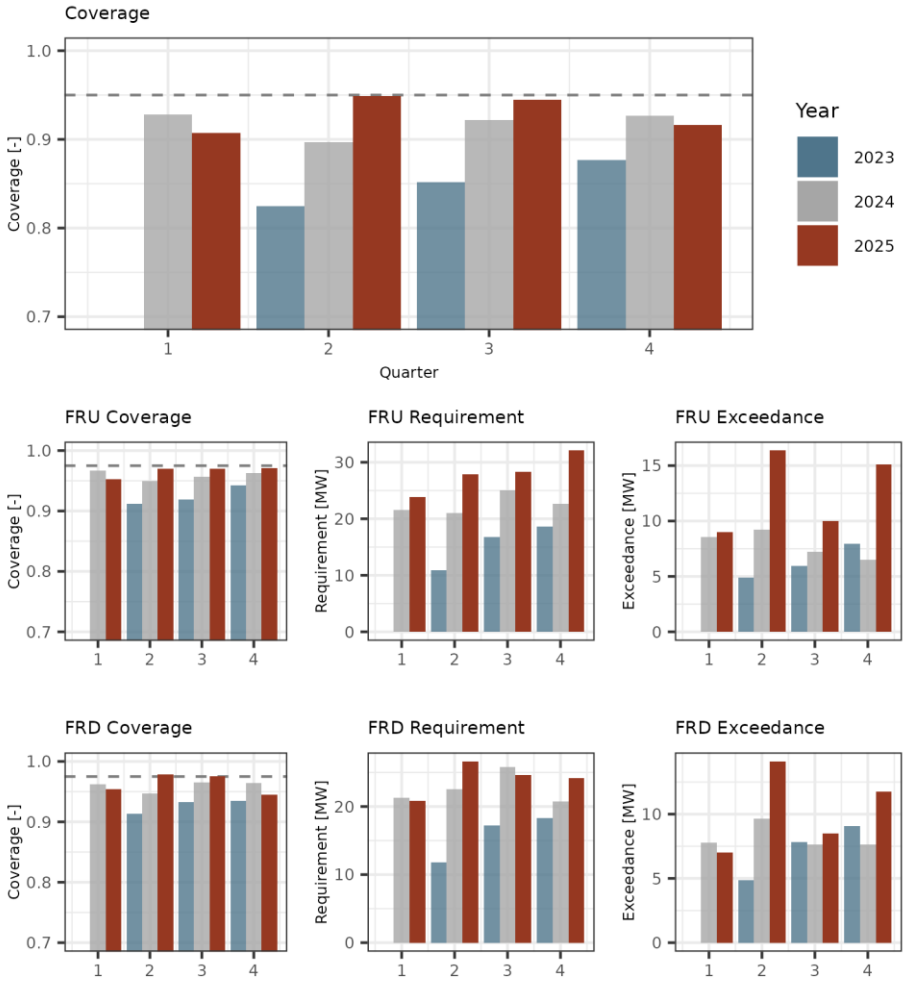
* FRD requirement and exceedance is impacted by VER submission issue. Forecasting is reviewing for potential discard.

TPWR



Data current to 2025-12-31

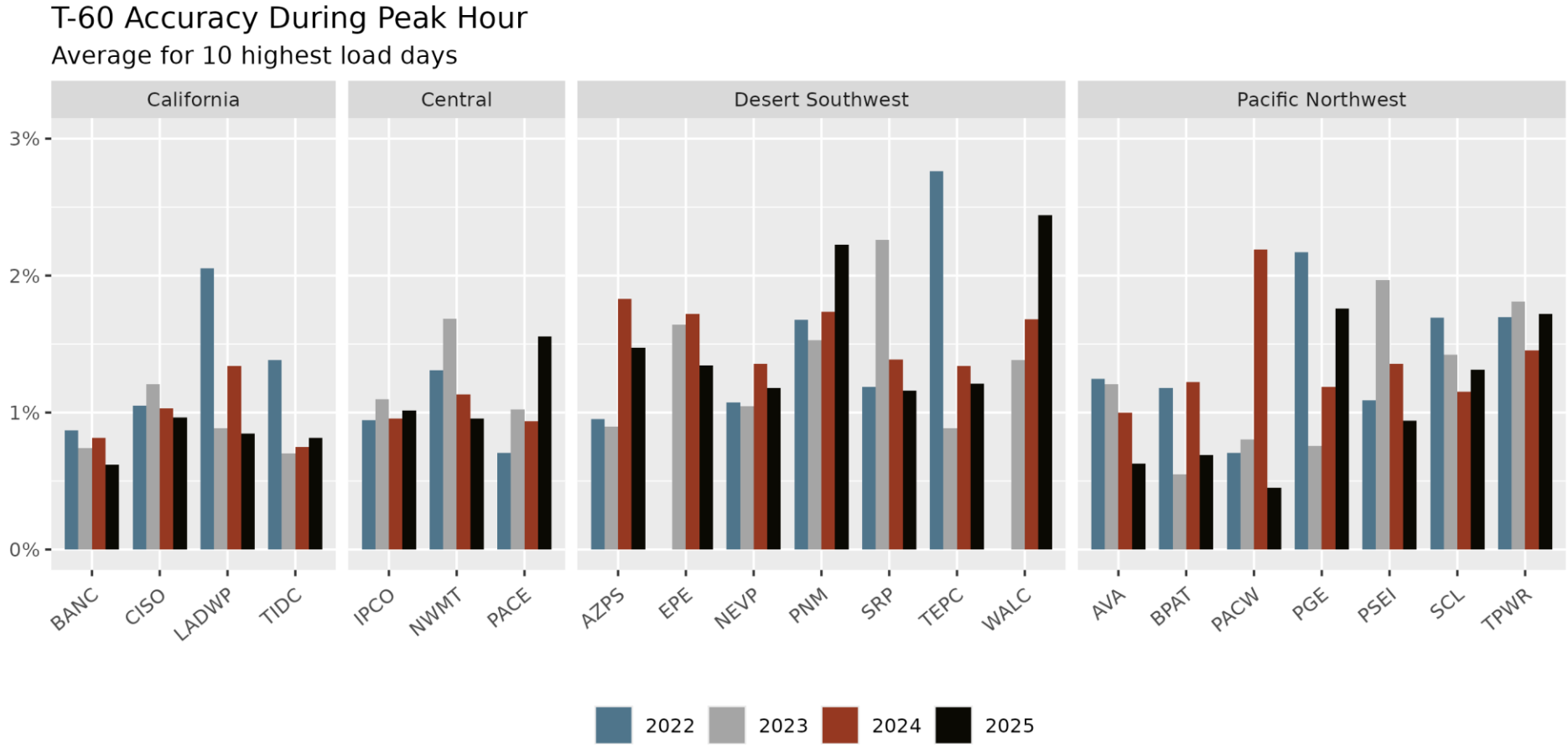
WALC



Data current to 2025-12-31

Demand Forecasting

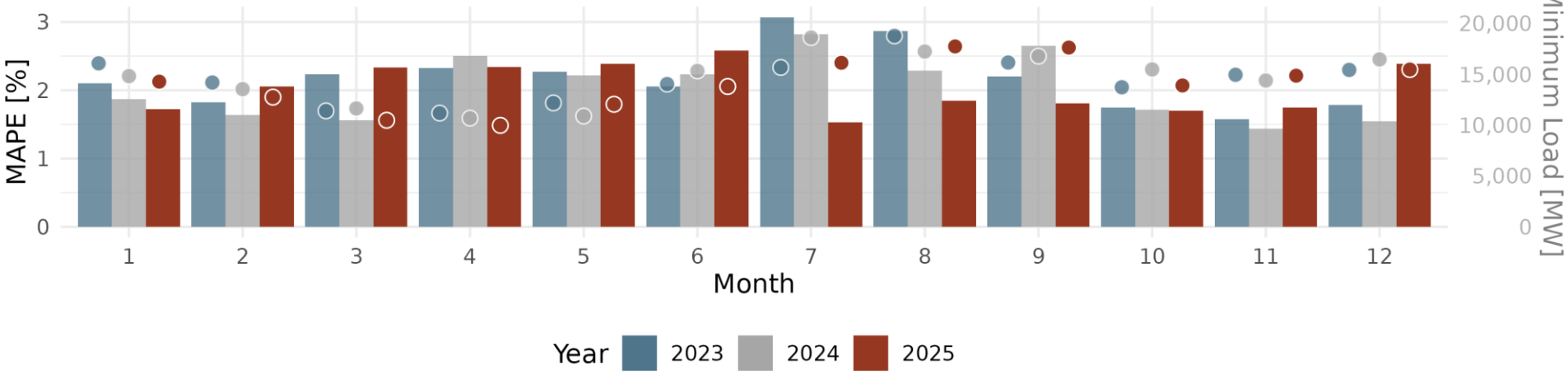
2025 accuracy on highest load days



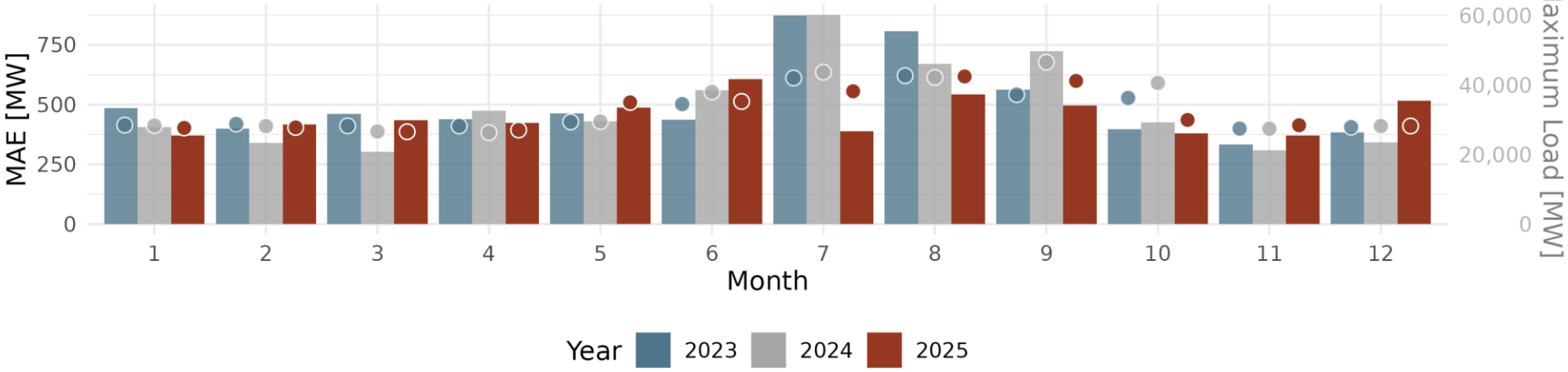
Sample current through 2025-12-31

Minor change from graph presented in Q3 2025. Most regions did not see higher peak loads Oct through Dec.

CAISO DA MAPE



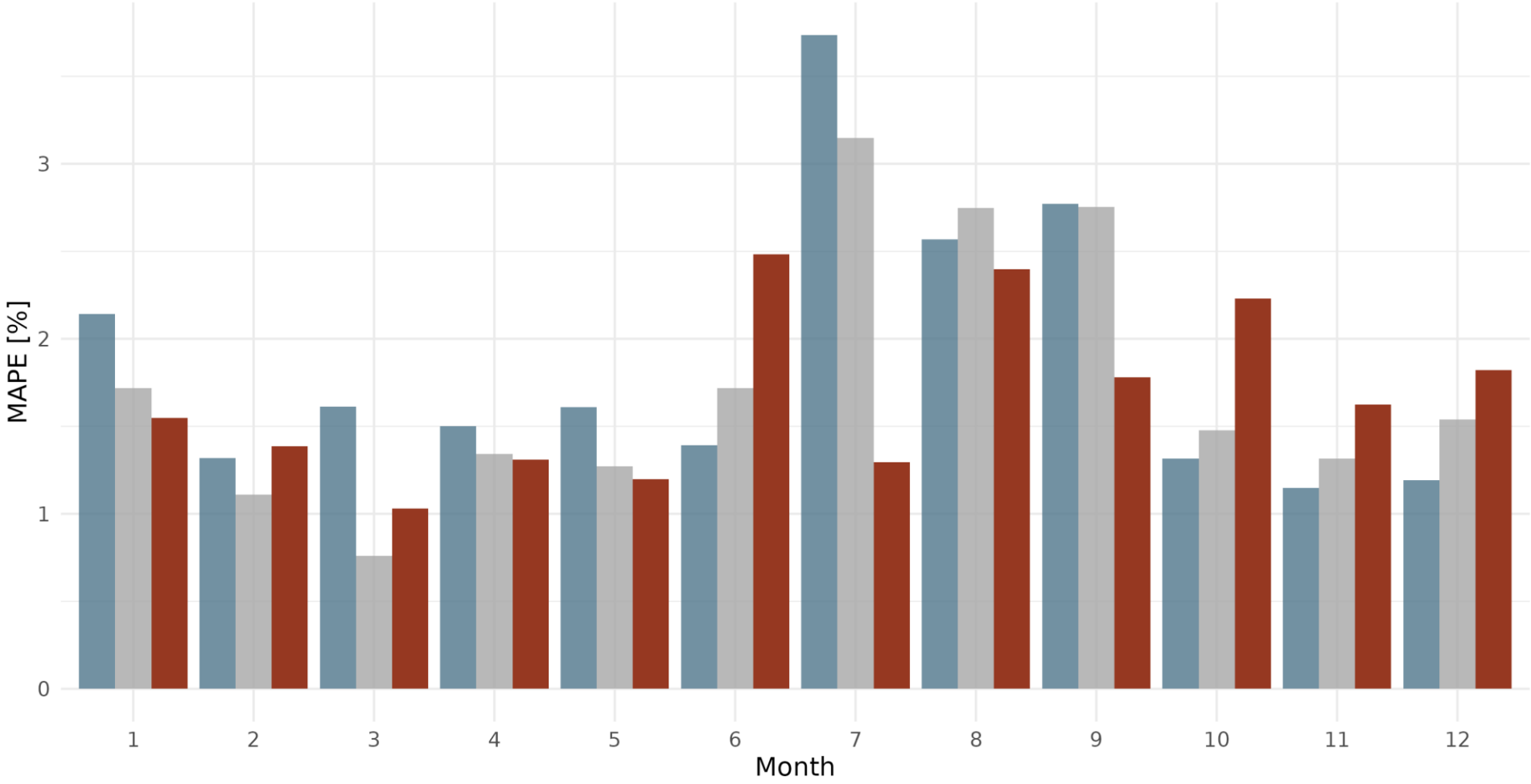
CAISO DA MAE



MAPE = abs(Forecast – Actual)/Actual
MAE = abs(Forecast – Actual)

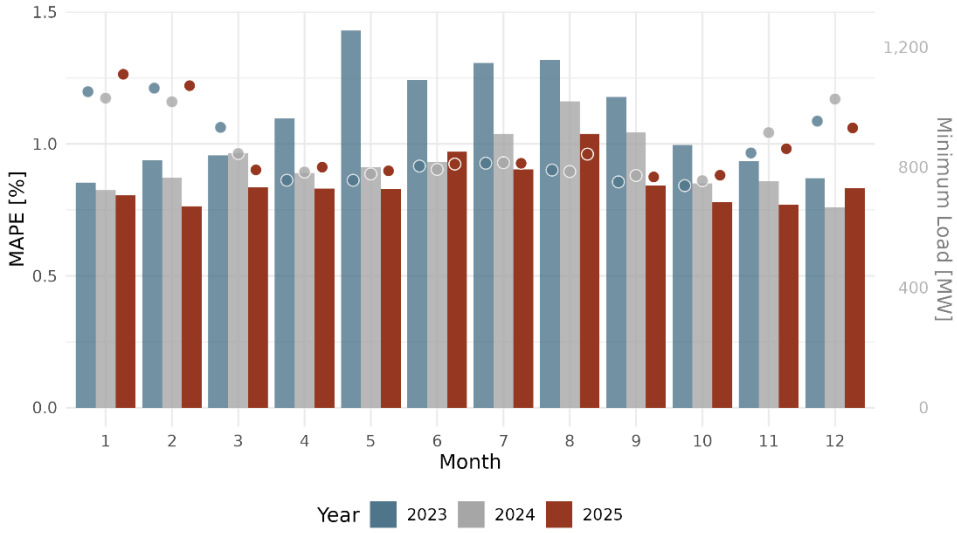
Bars use primary y-axis at left. Points use secondary y-axis at right.

CAISO DA Peak Forecast

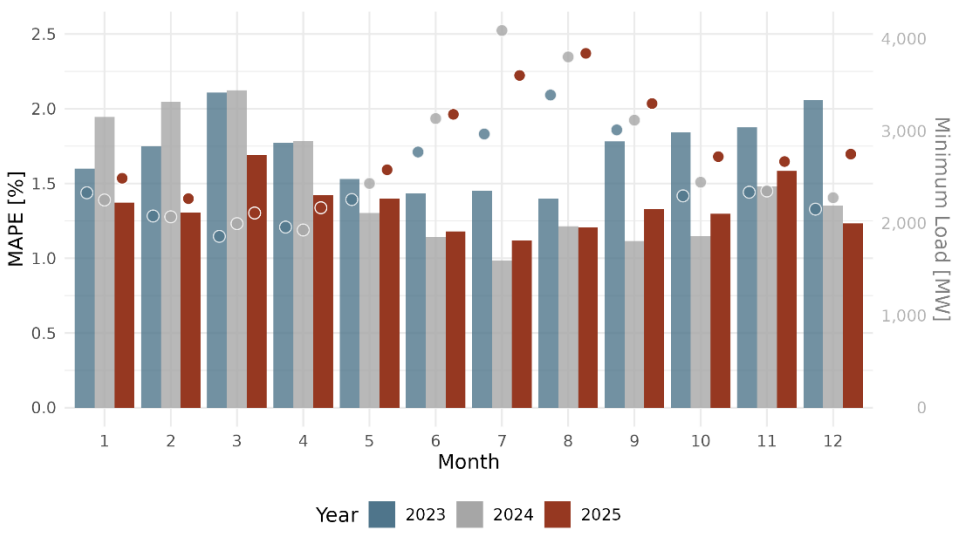


In Q4 2025, most peak MAPE came from overforecast error (forecast > actual).

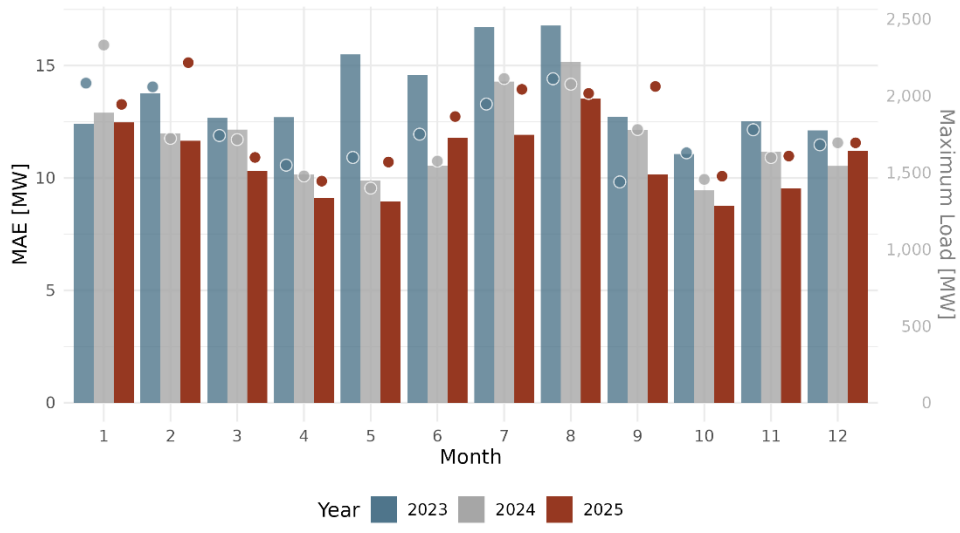
AVA T-60 MAPE



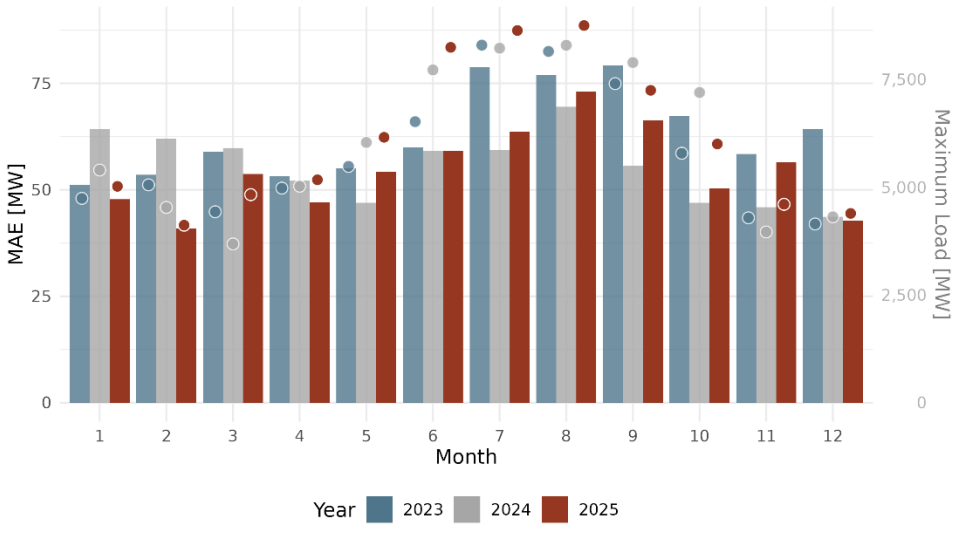
APS T-60 MAPE



AVA T-60 MAE



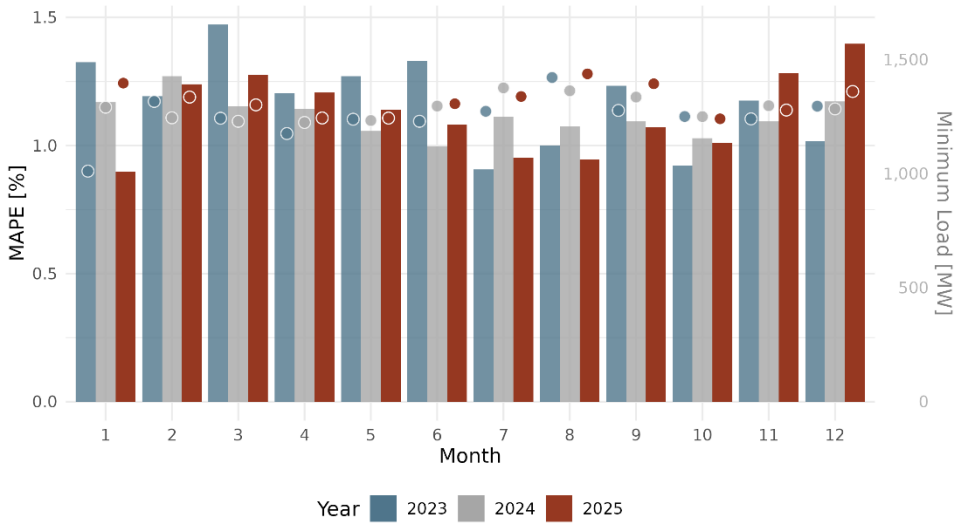
APS T-60 MAE



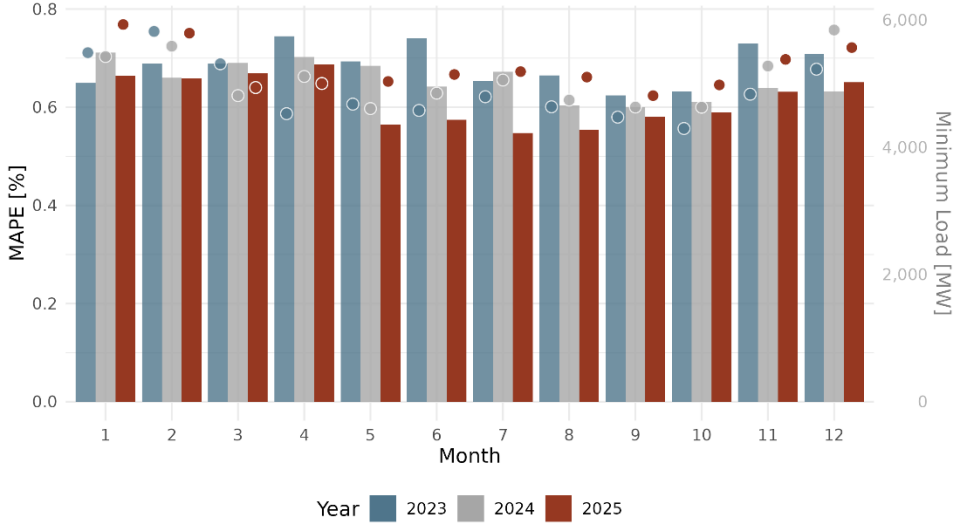
Bars use primary y-axis at left. Points use secondary y-axis at right.

Bars use primary y-axis at left. Points use secondary y-axis at right.

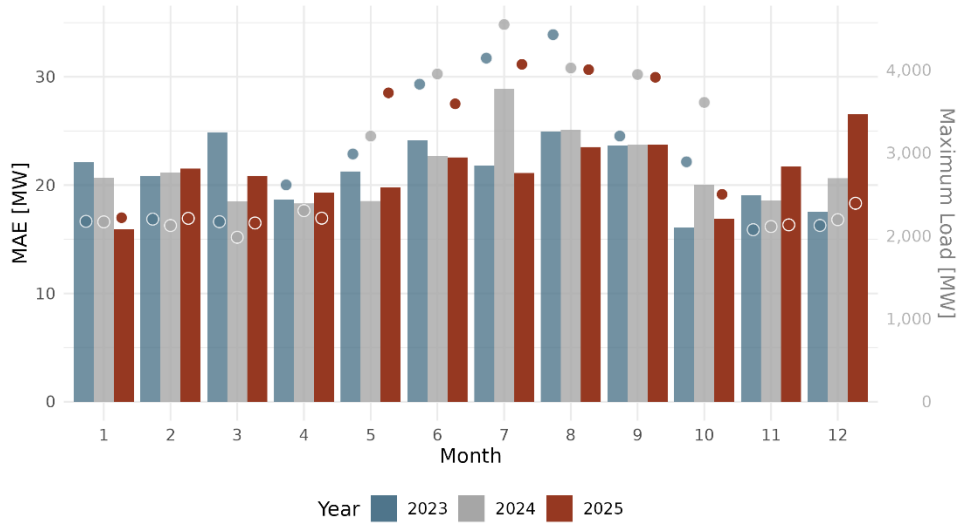
BANC T-60 MAPE



BPA T-60 MAPE

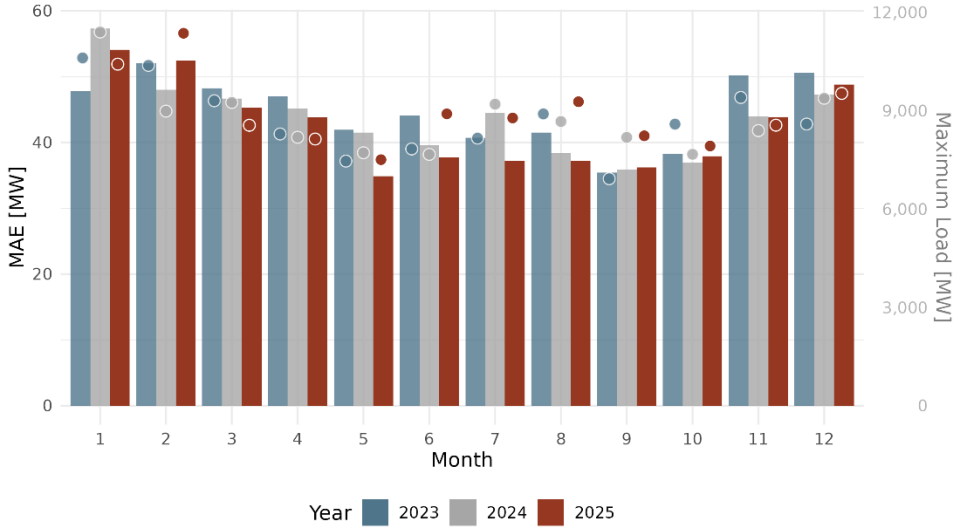


BANC T-60 MAE



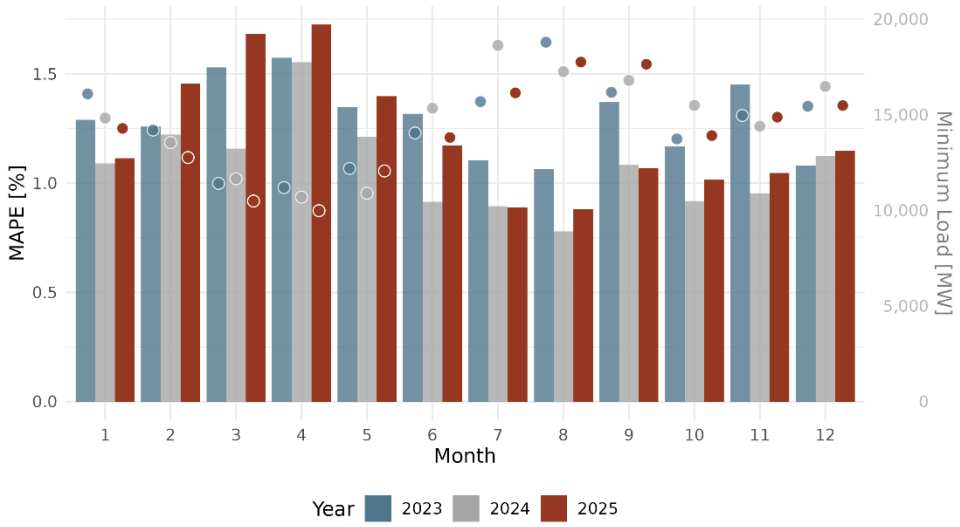
Bars use primary y-axis at left. Points use secondary y-axis at right.

BPA T-60 MAE

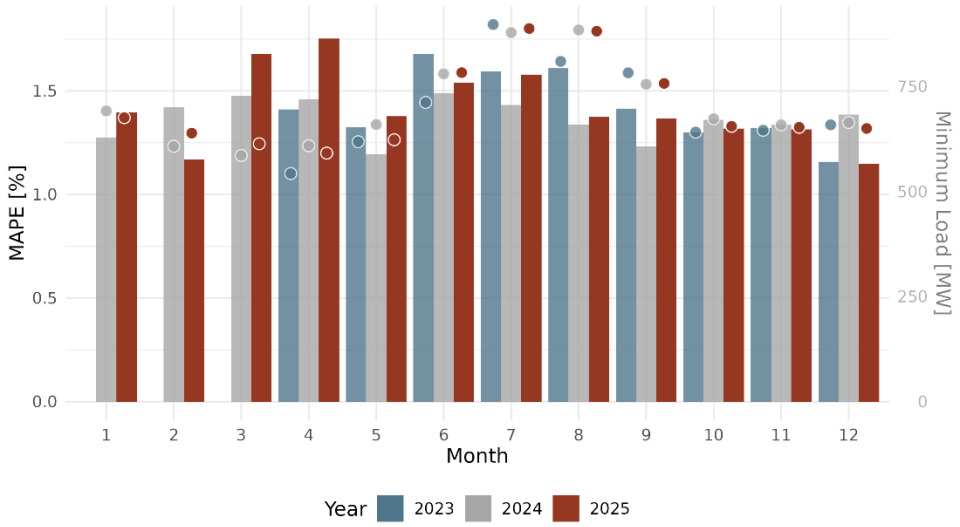


Bars use primary y-axis at left. Points use secondary y-axis at right.

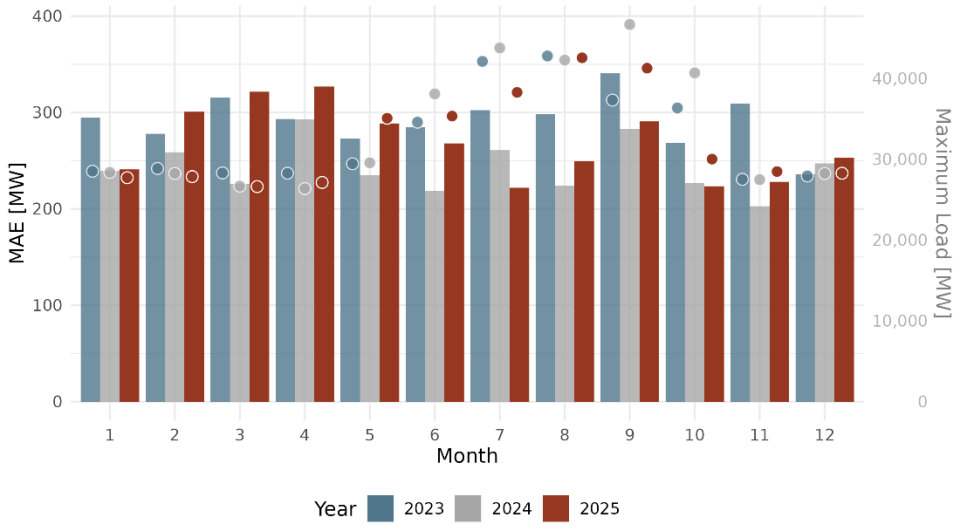
CAISO HASP MAPE



EPE T-60 MAPE



CAISO HASP MAE



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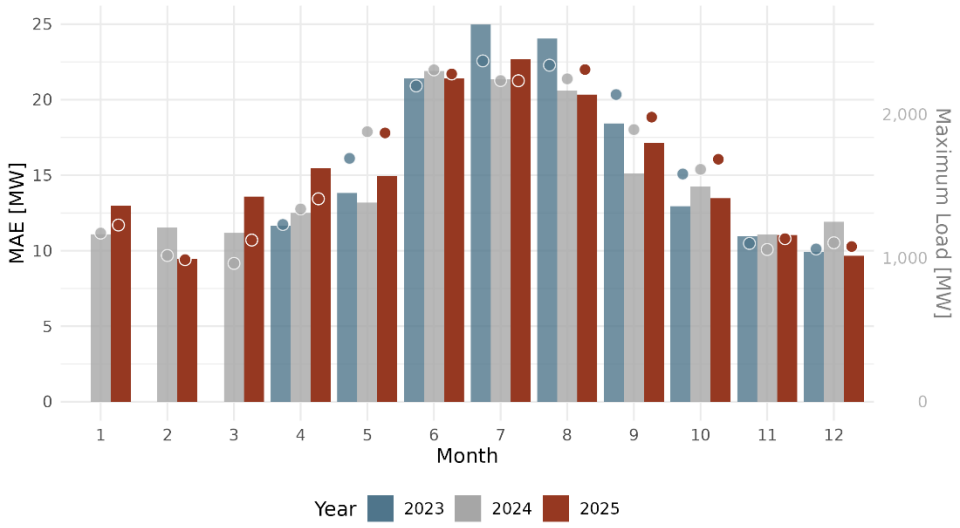
EPE T-60 MAE



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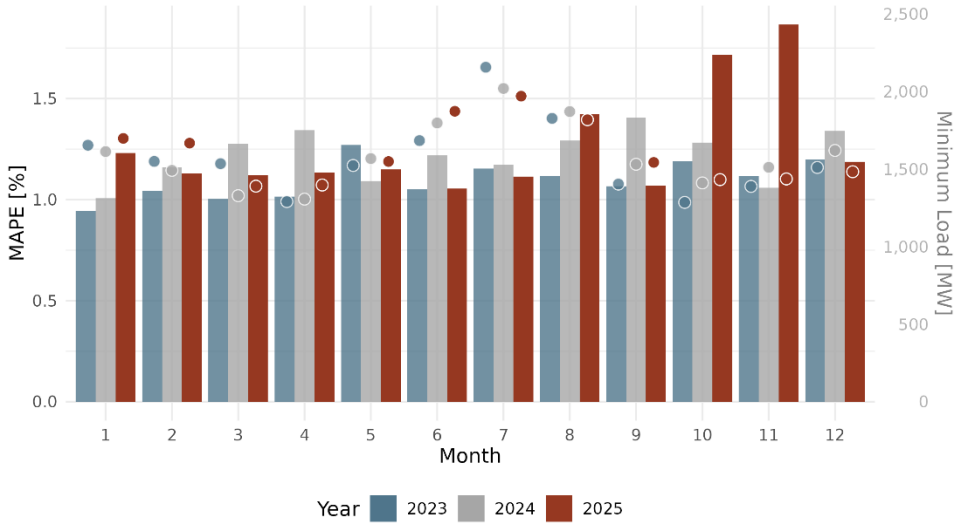
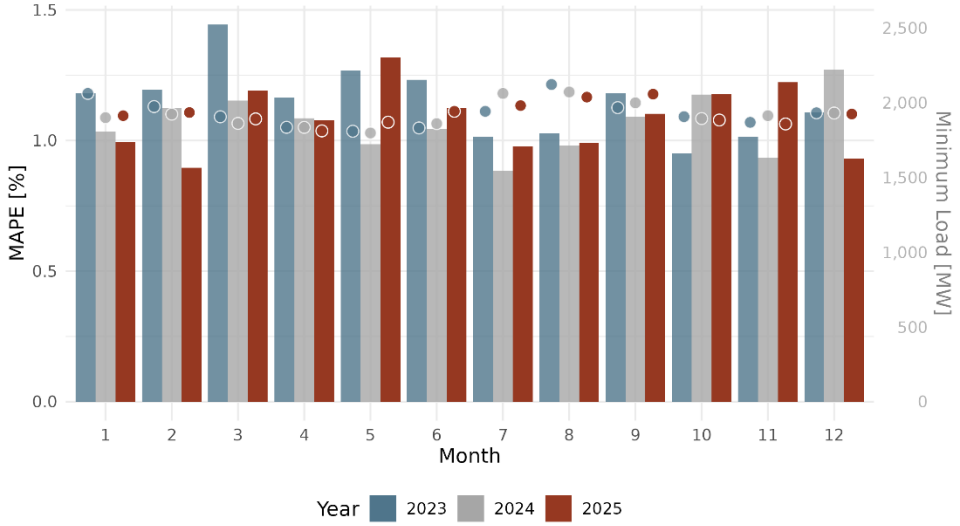
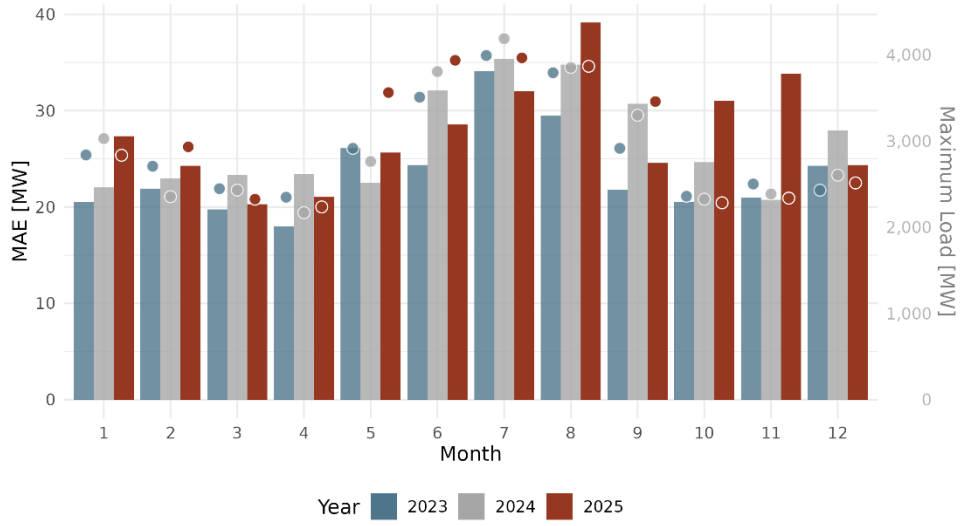
IPCO T-60 MAPE



LADWP T-60 MAPE

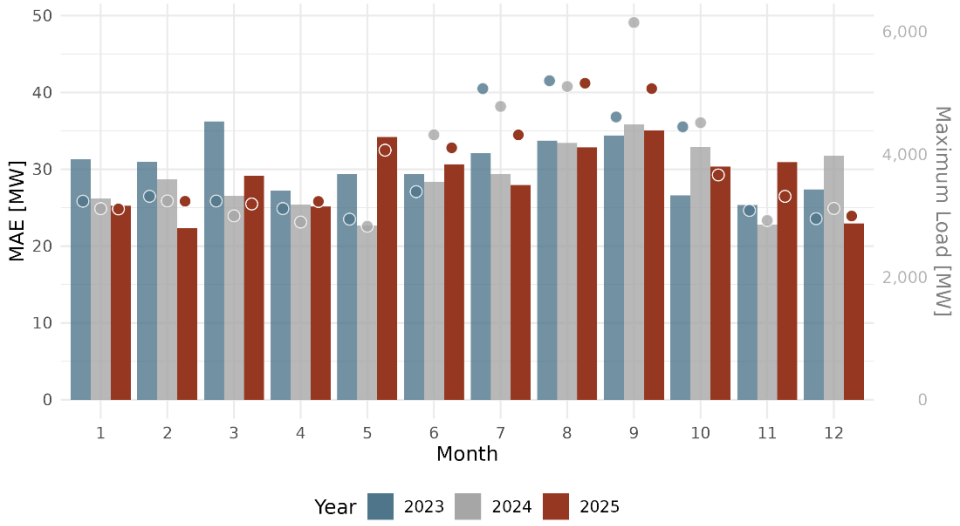


IPCO T-60 MAE



Bars use primary y-axis at left. Points use secondary y-axis at right.

LADWP T-60 MAE



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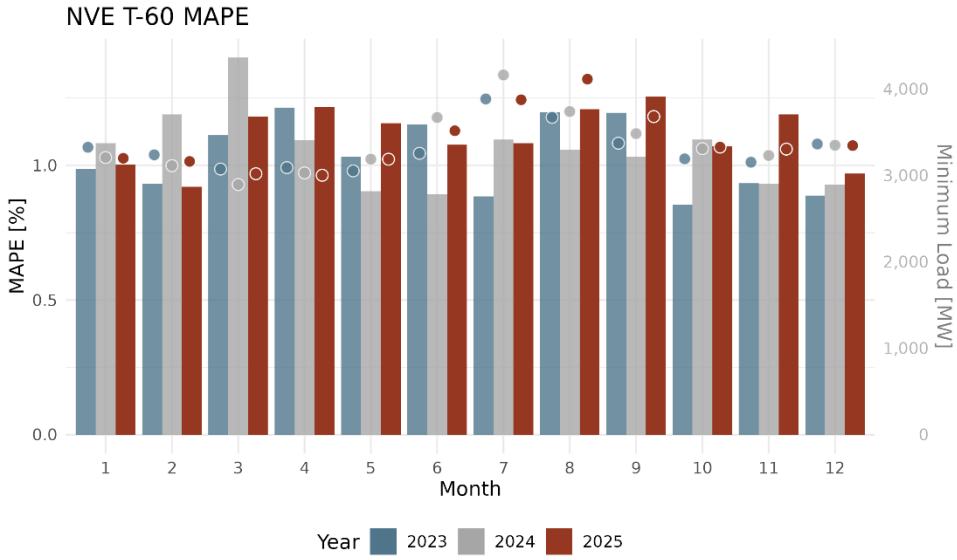

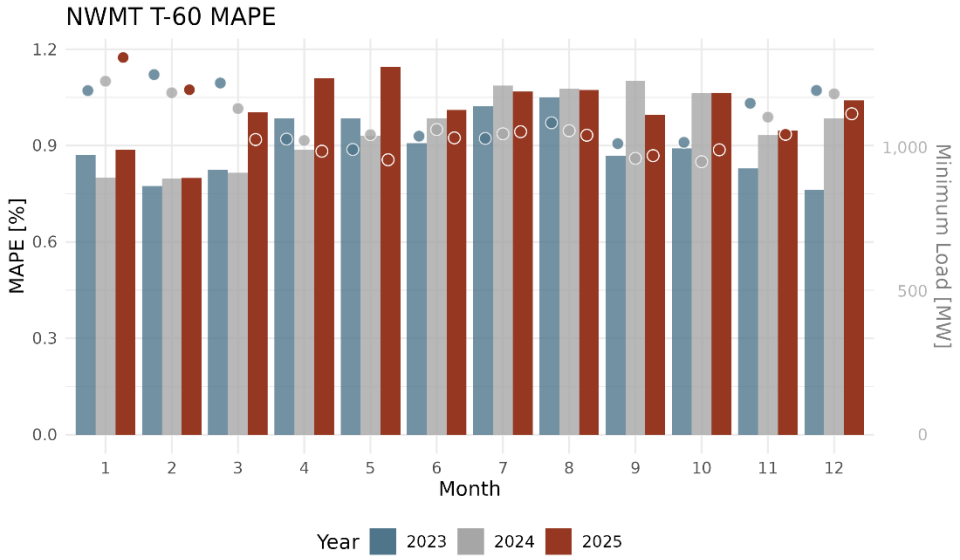

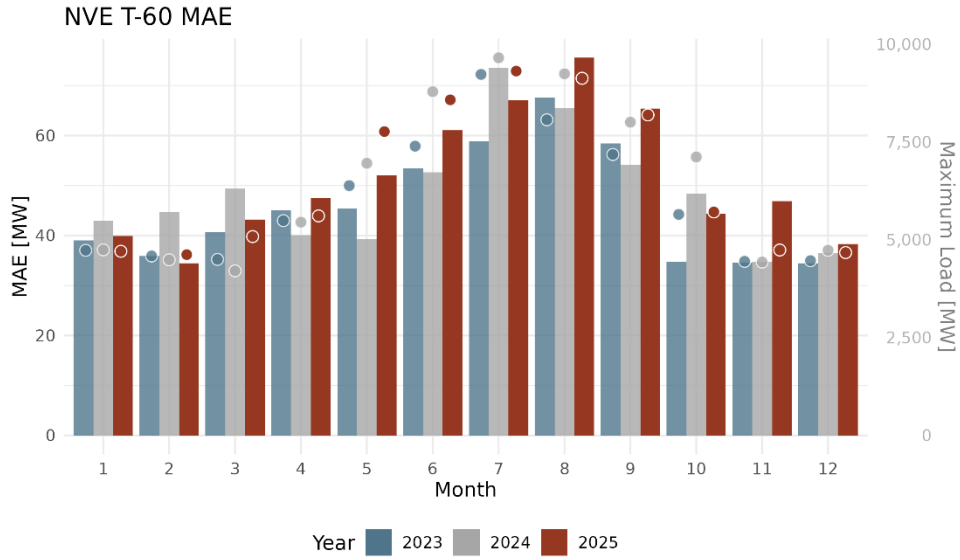

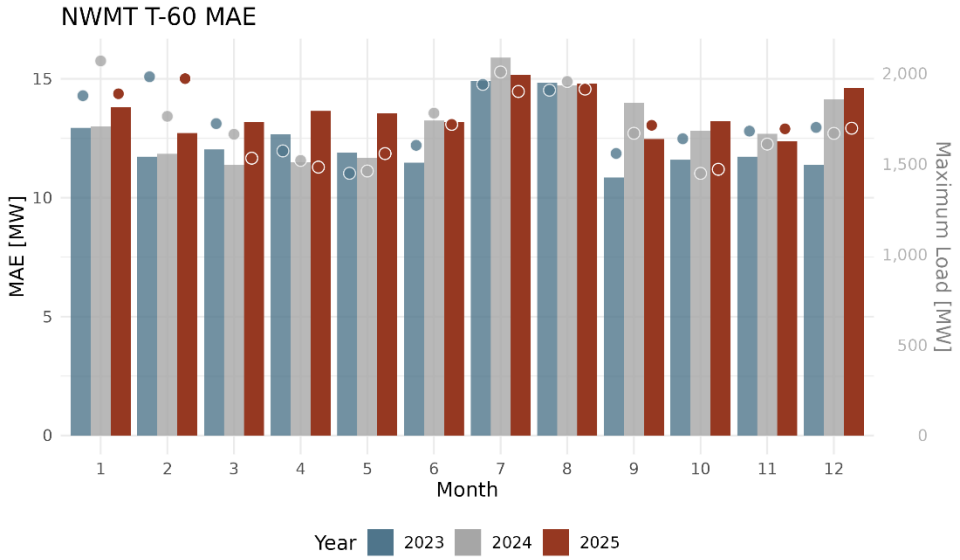

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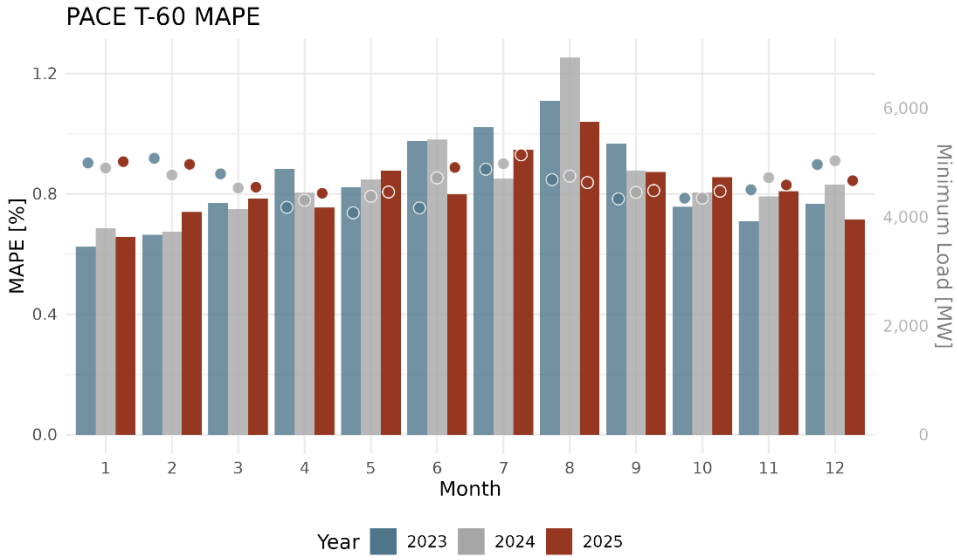

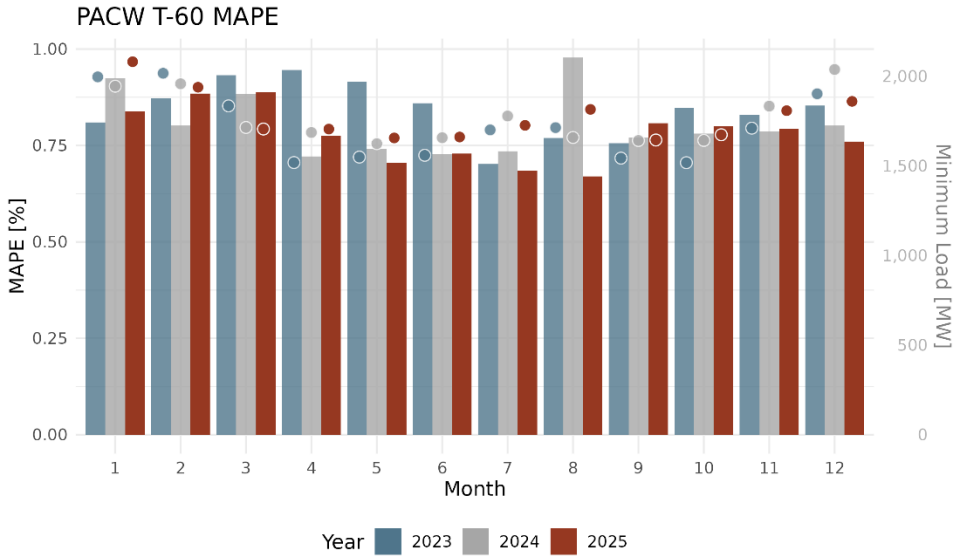

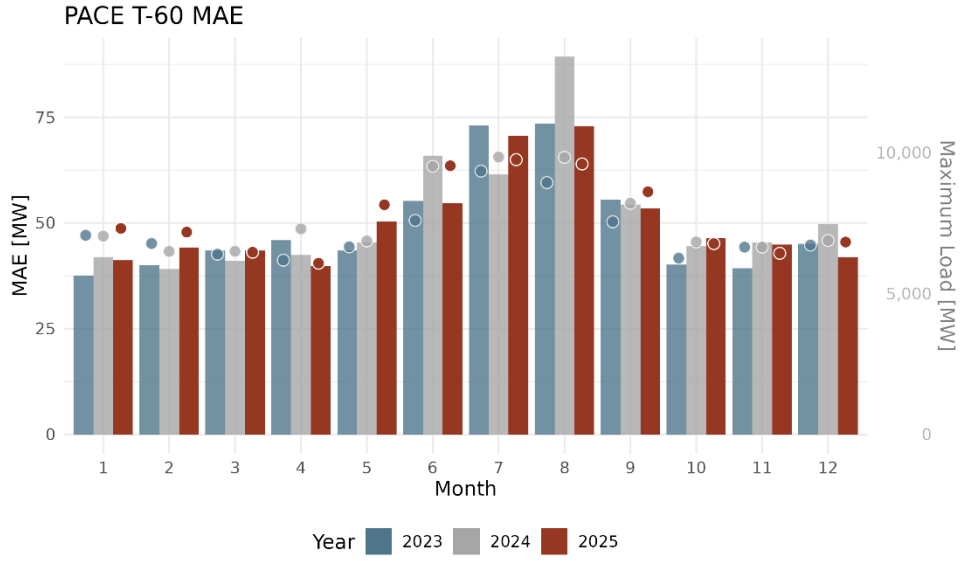

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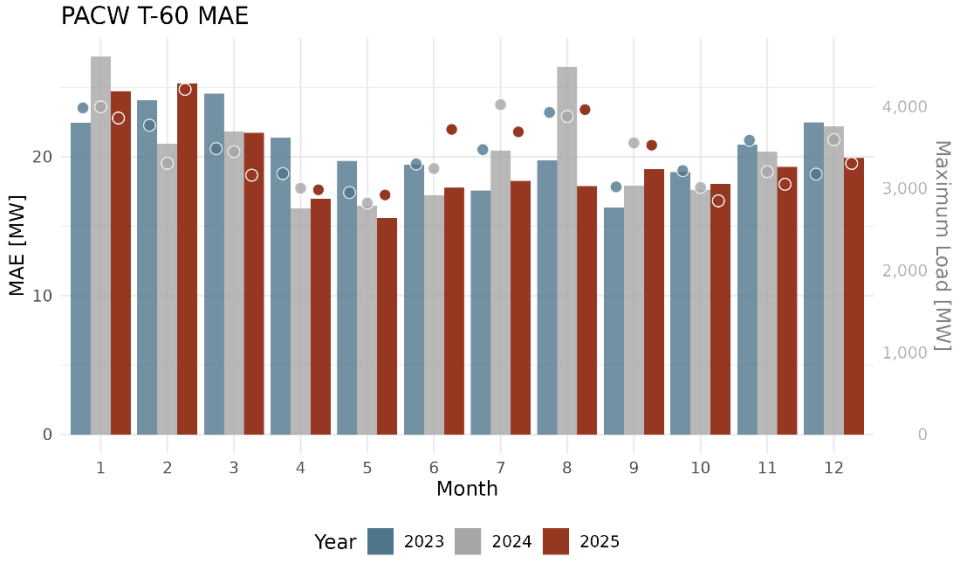

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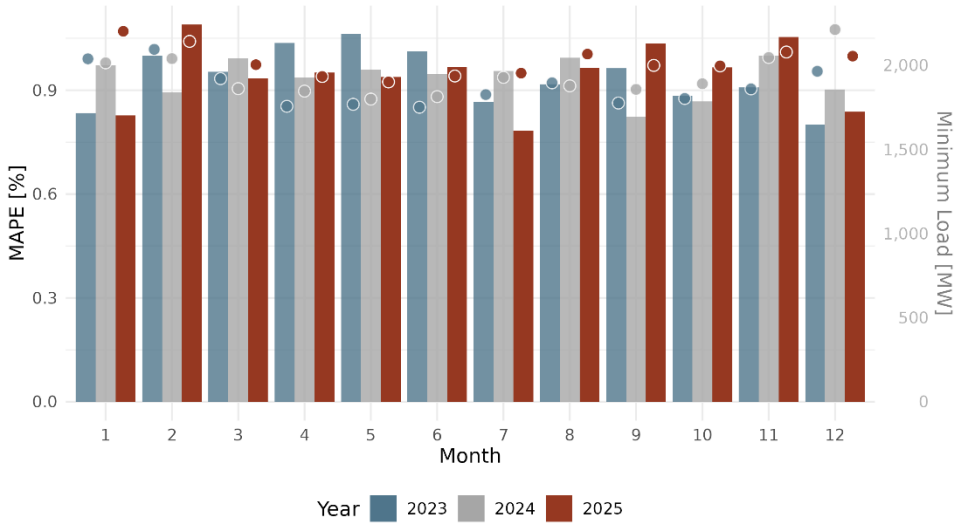
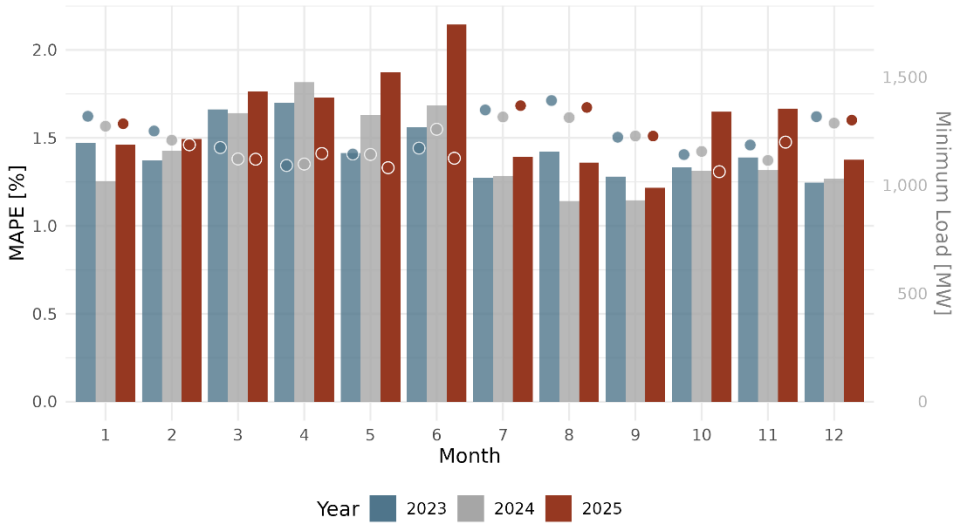
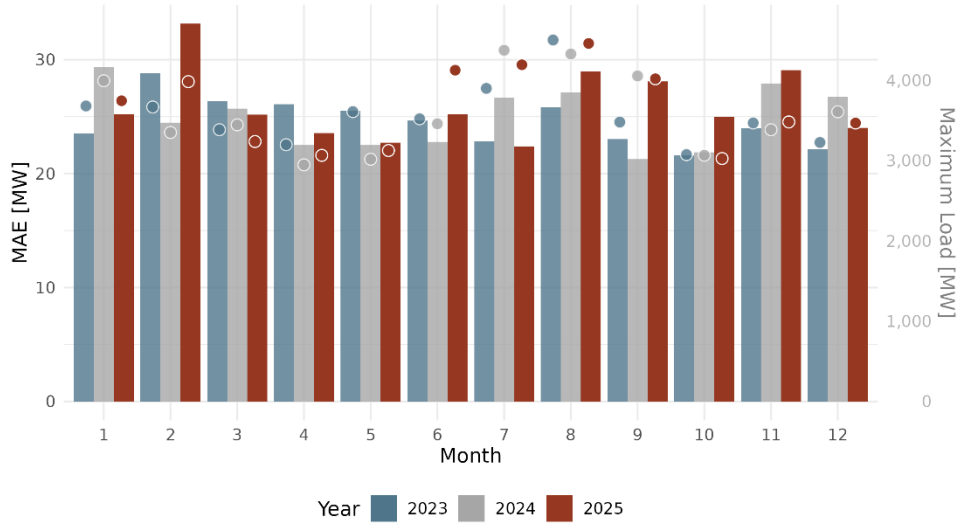
PGE T-60 MAPE



PNM T-60 MAPE



PGE T-60 MAE



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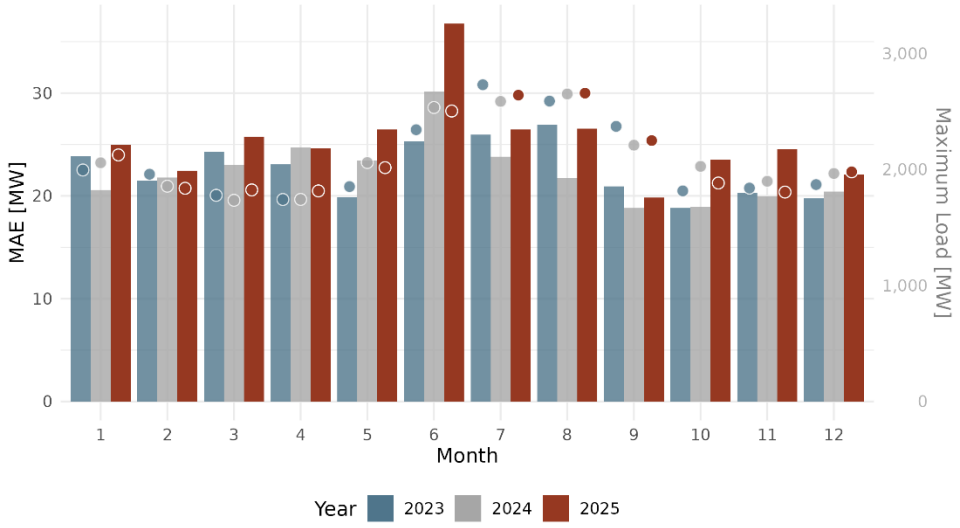

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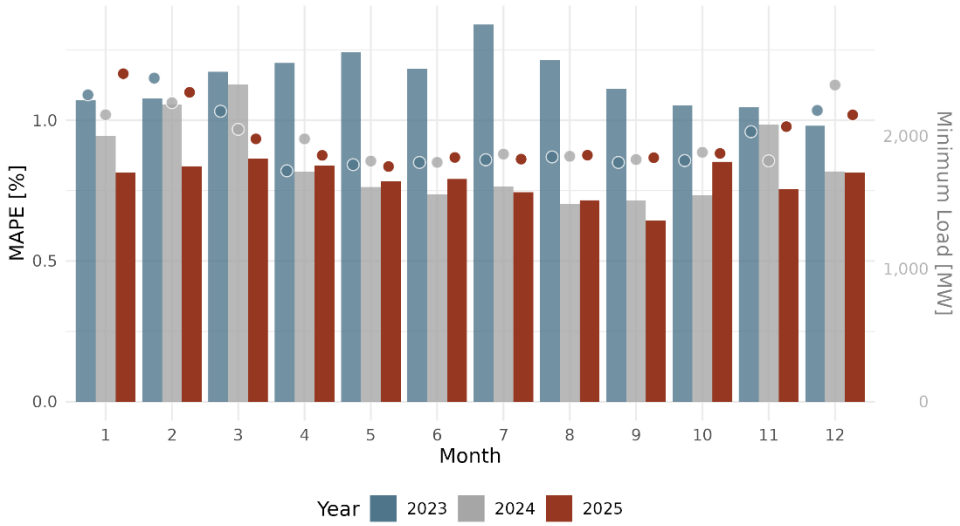
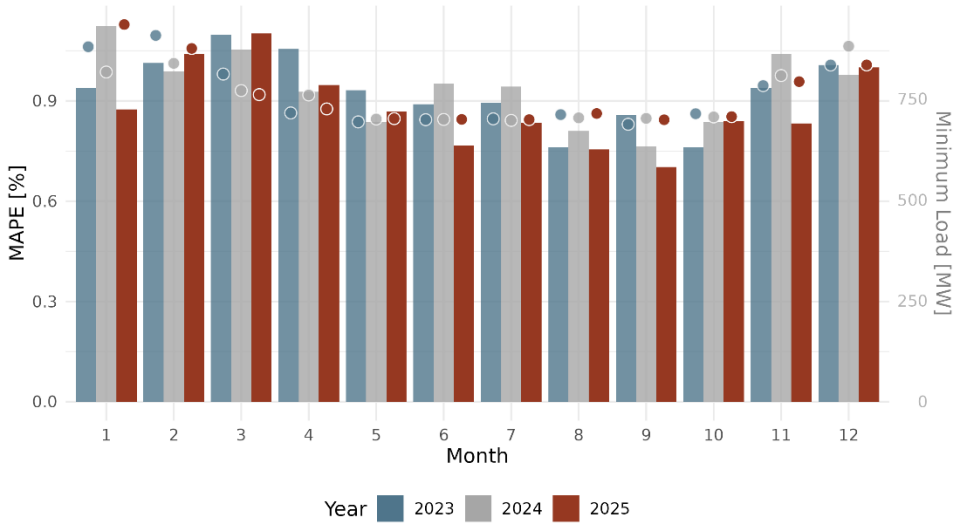
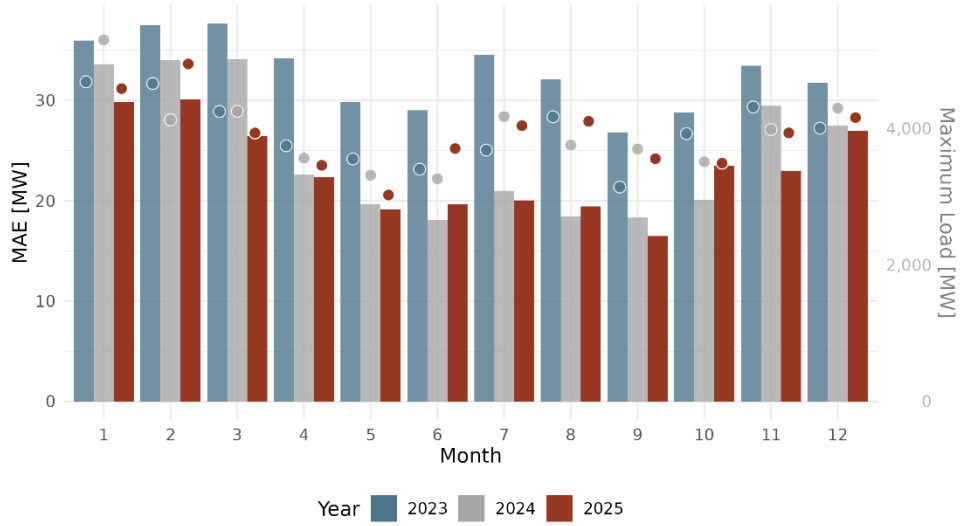
PSE T-60 MAPE



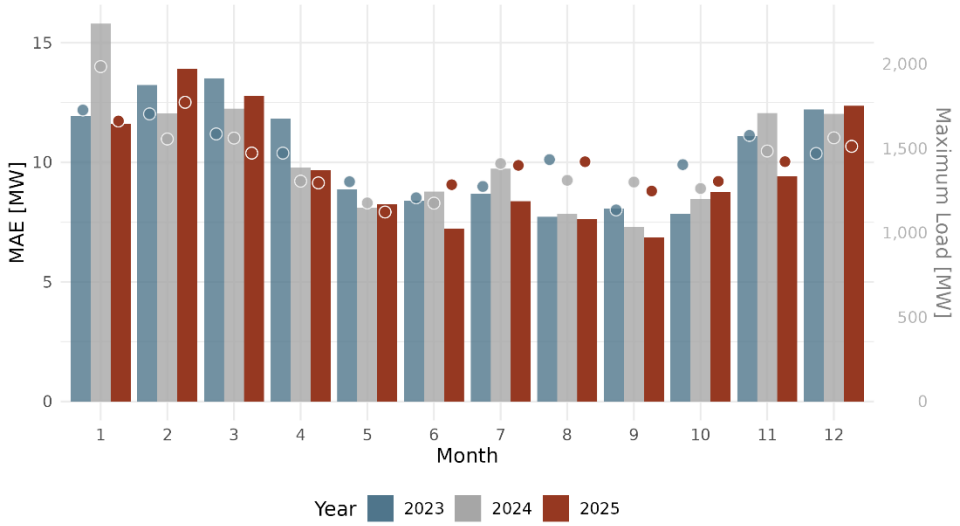
SCL T-60 MAPE



PSE T-60 MAE



SCL T-60 MAE



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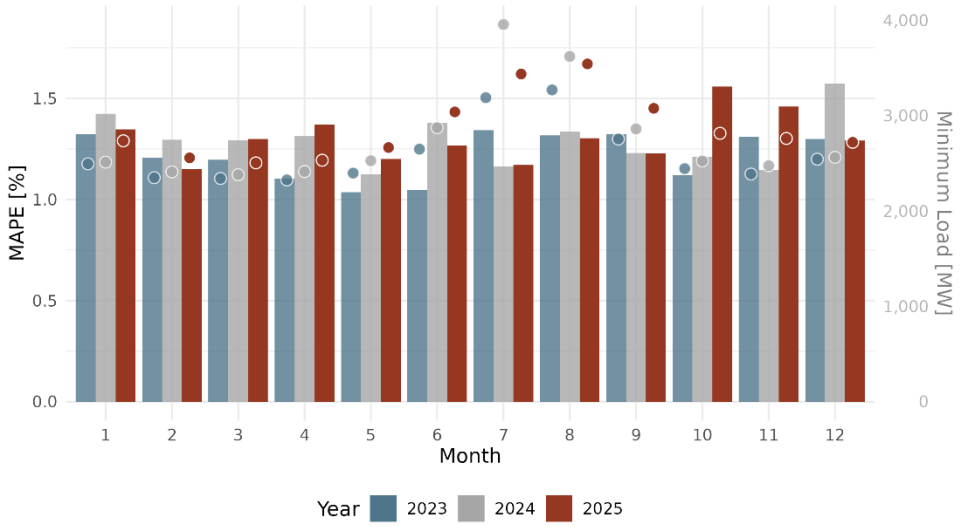
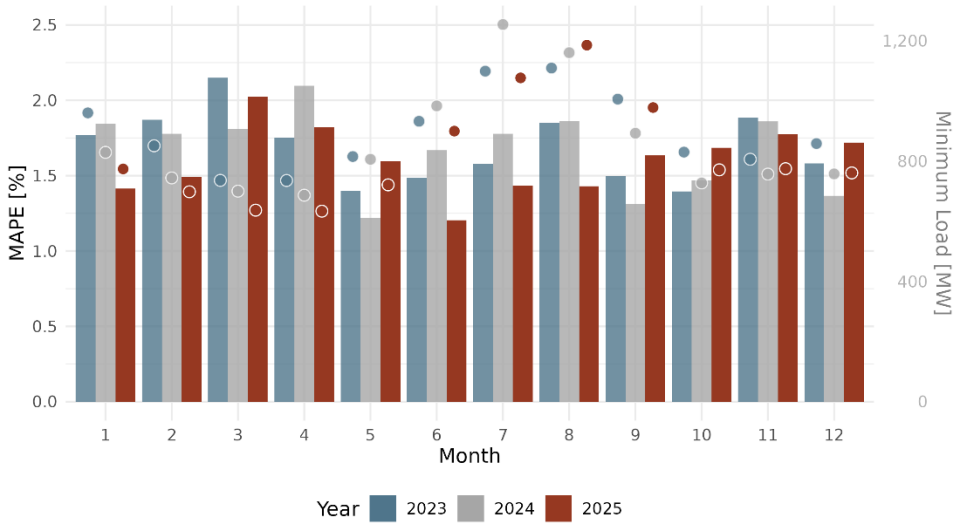
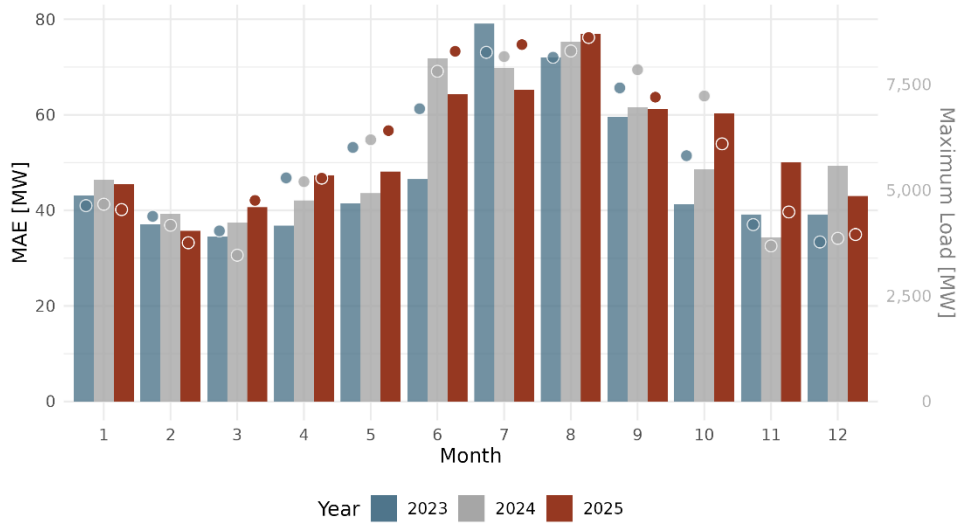
SRP T-60 MAPE



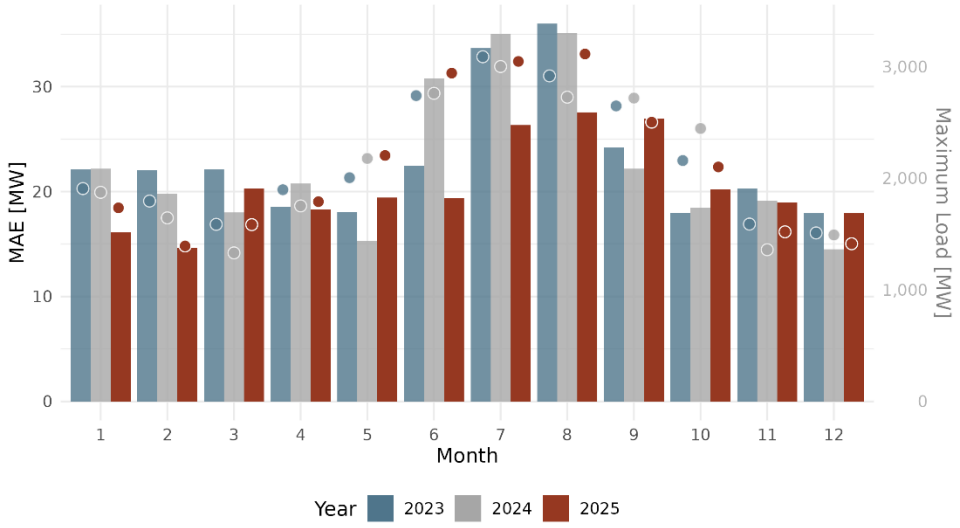
TEP T-60 MAPE



SRP T-60 MAE



TEP T-60 MAE



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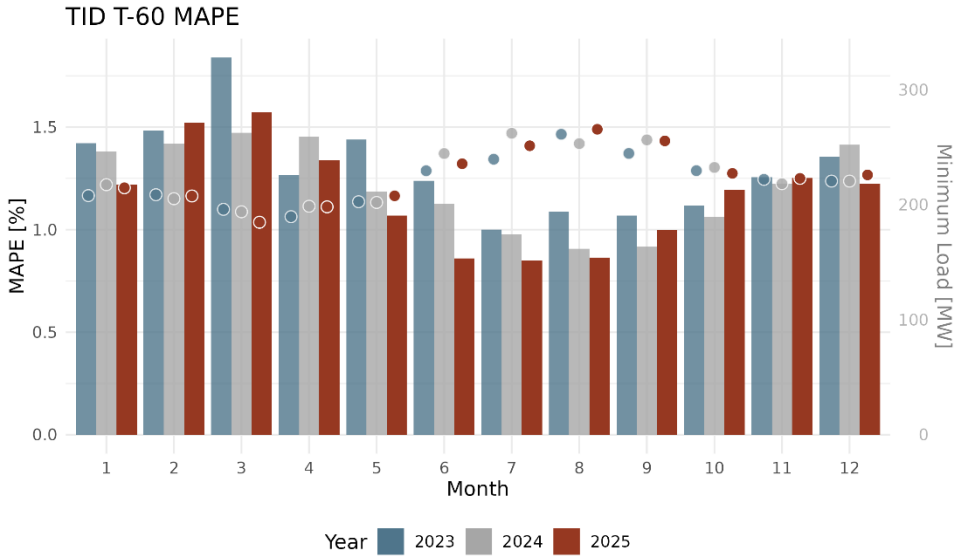
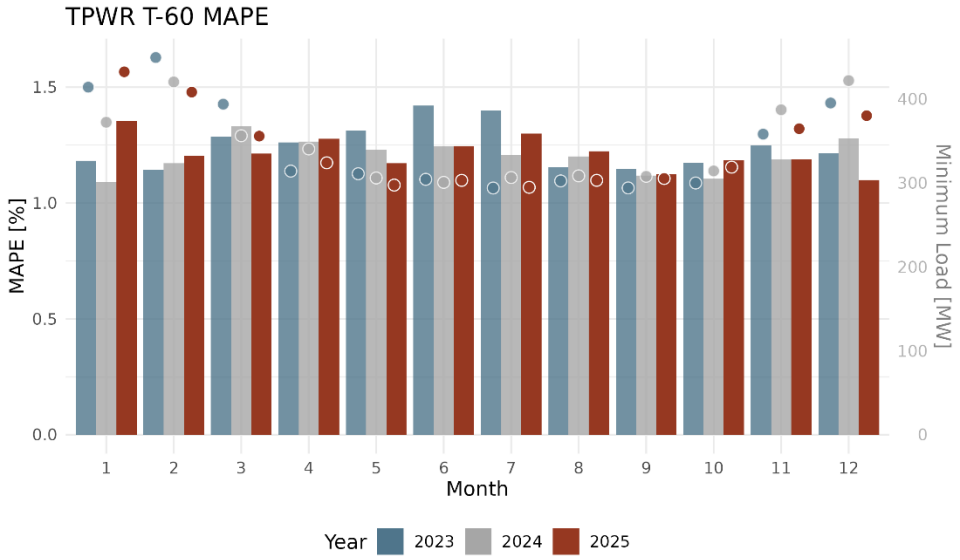
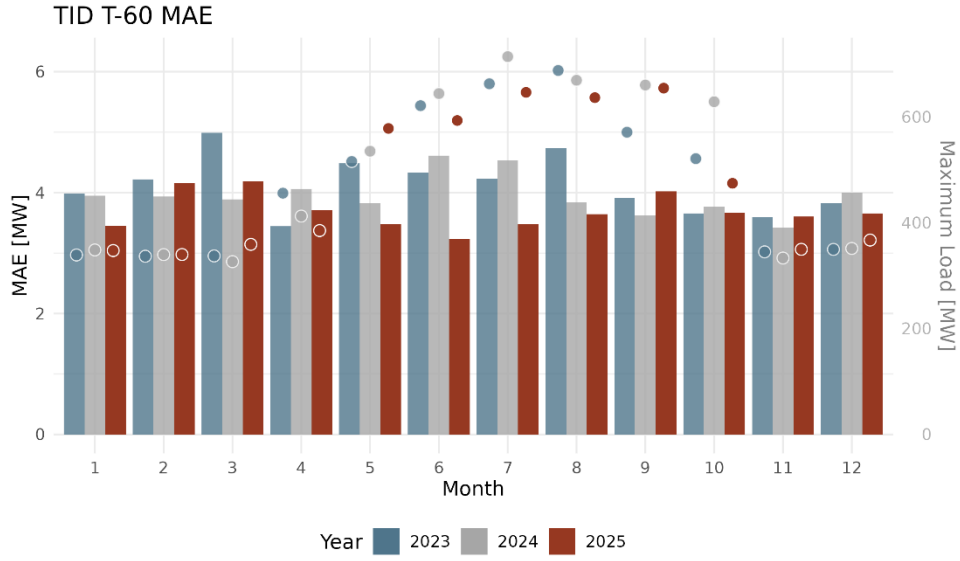
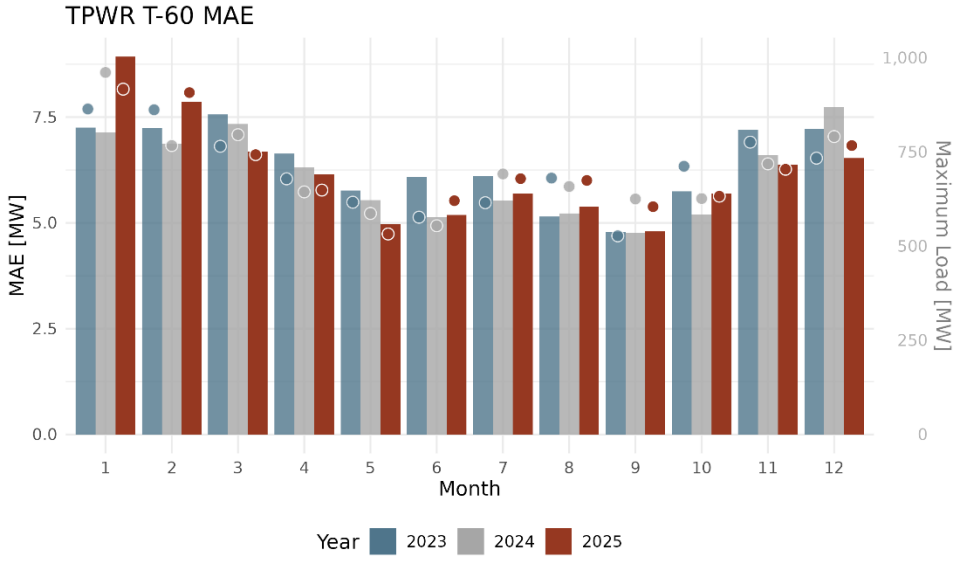




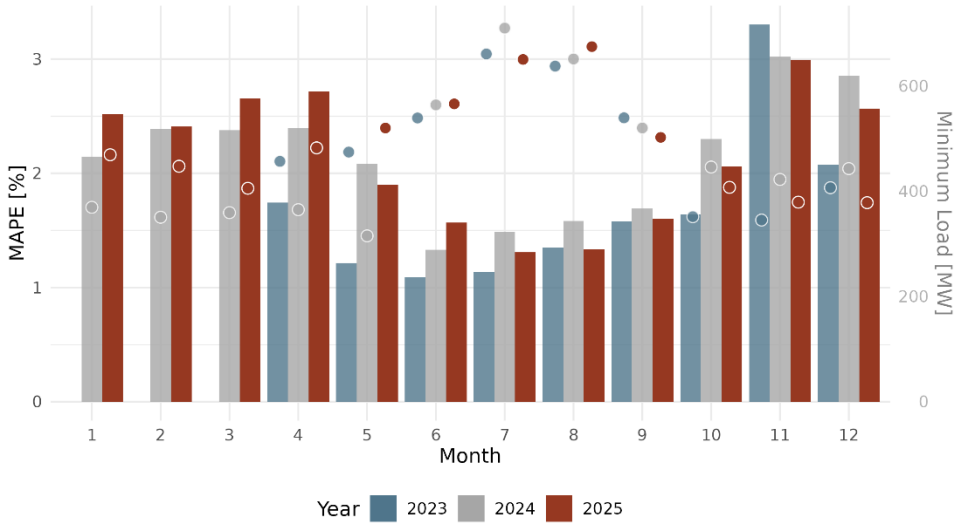


Bars use primary y-axis at left. Points use secondary y-axis at right.

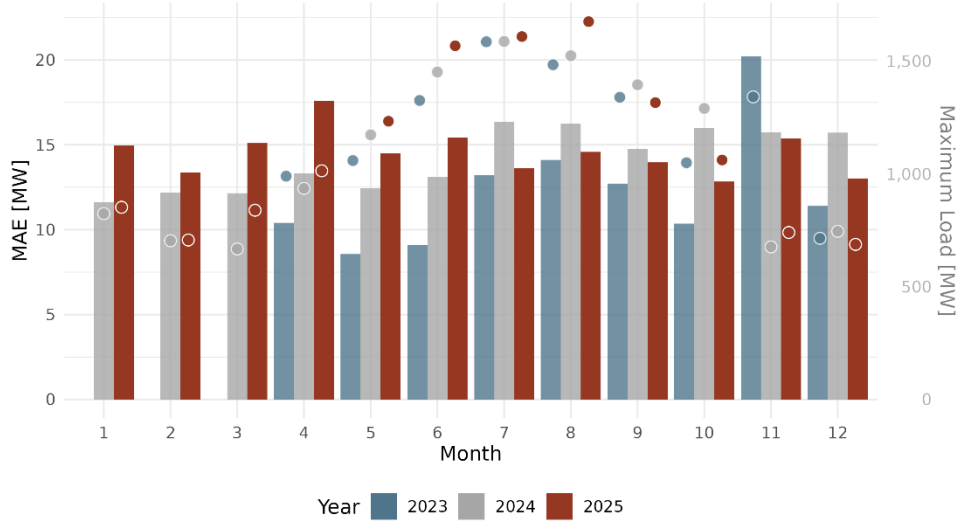


Bars use primary y-axis at left. Points use secondary y-axis at right.

WALC T-60 MAPE



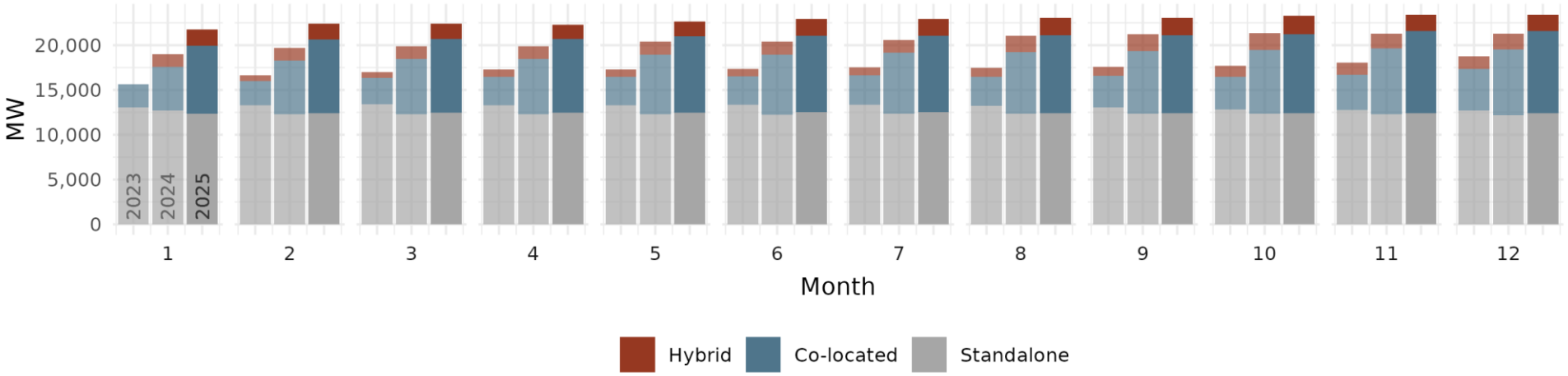
WALC T-60 MAE



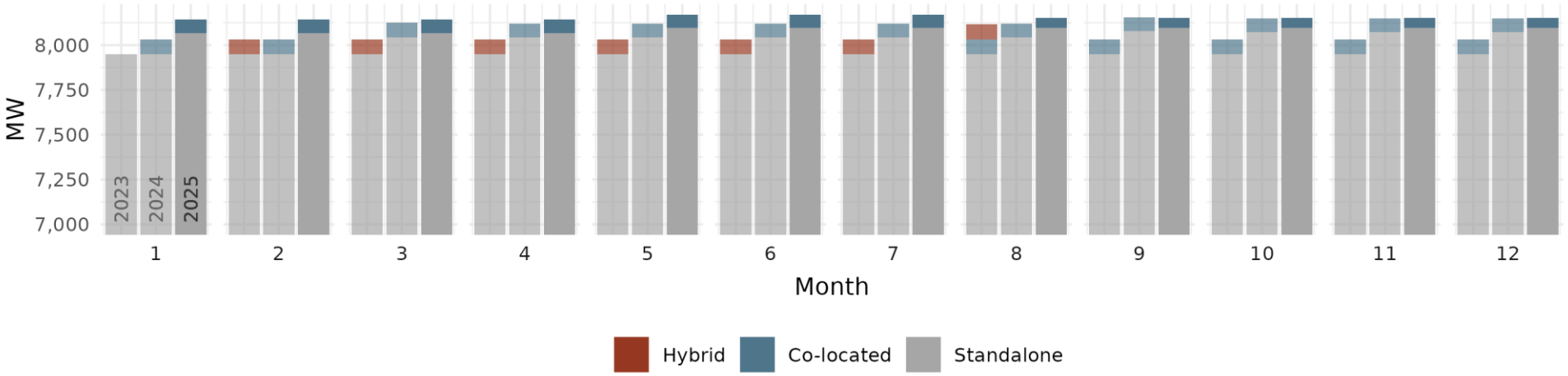
Bars use primary y-axis at left. Points use secondary y-axis at right.

Renewable Forecasting

CAISO solar capacity

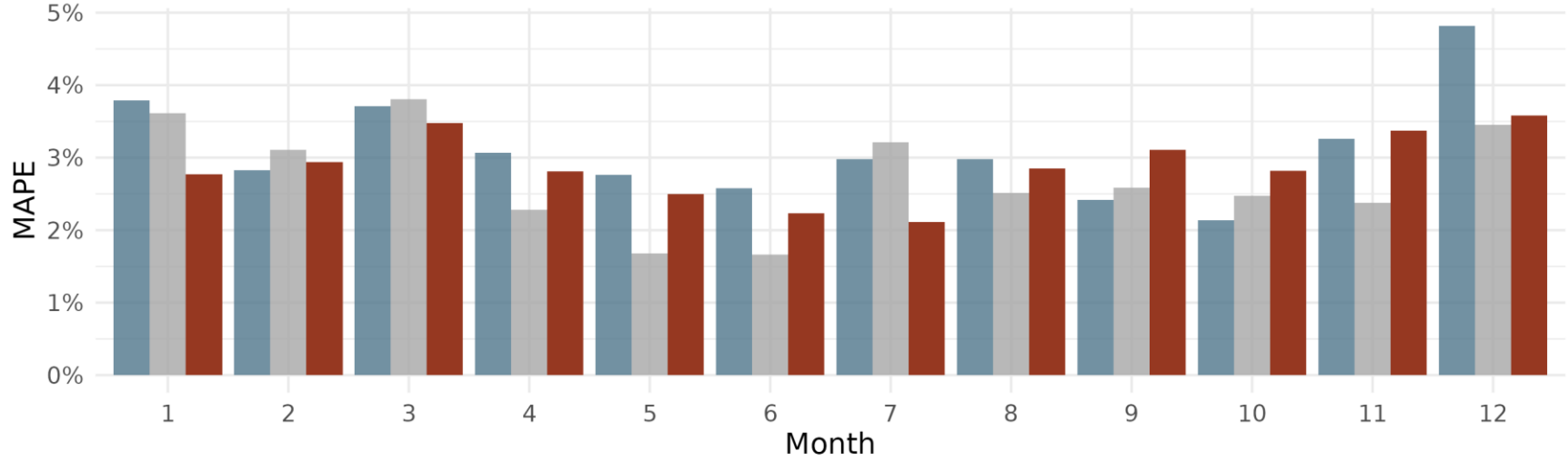


CAISO wind capacity

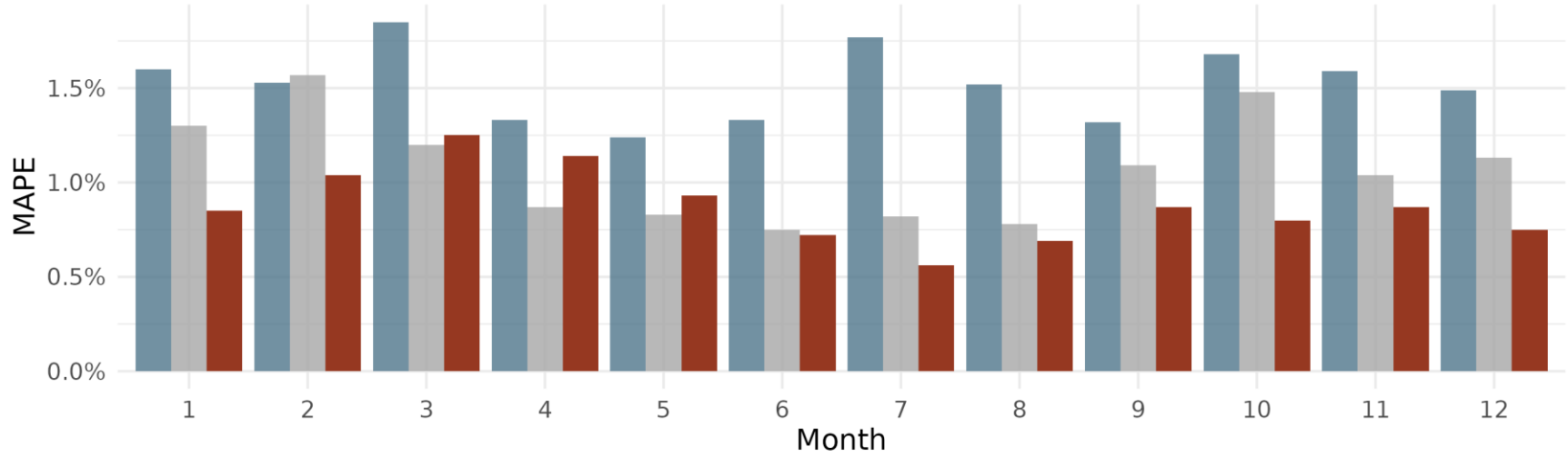


Note, the y-axis uses a non-zero baseline.

DA solar forecast

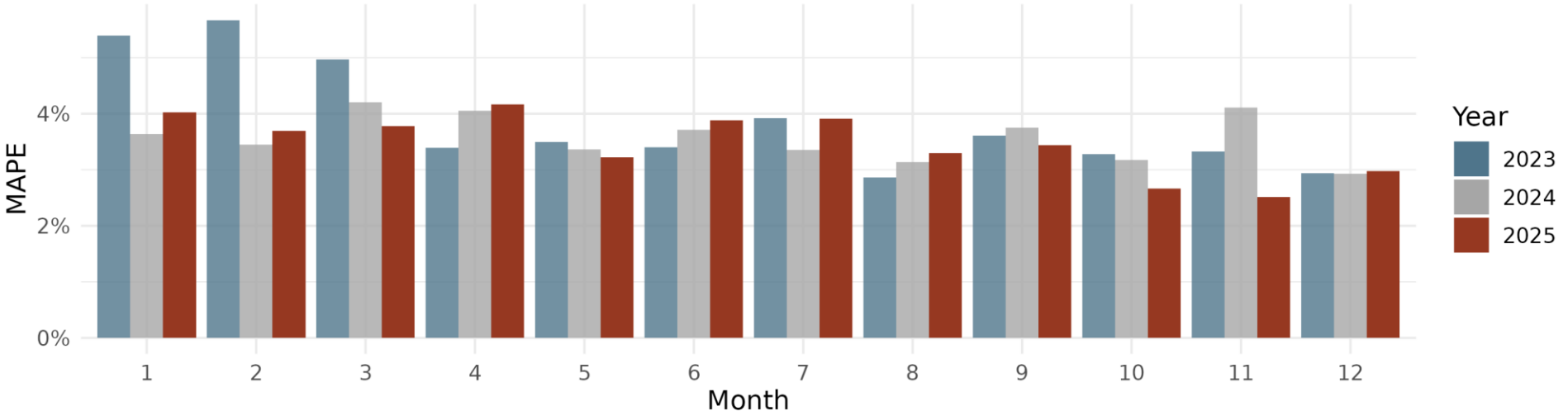


RTD solar forecast

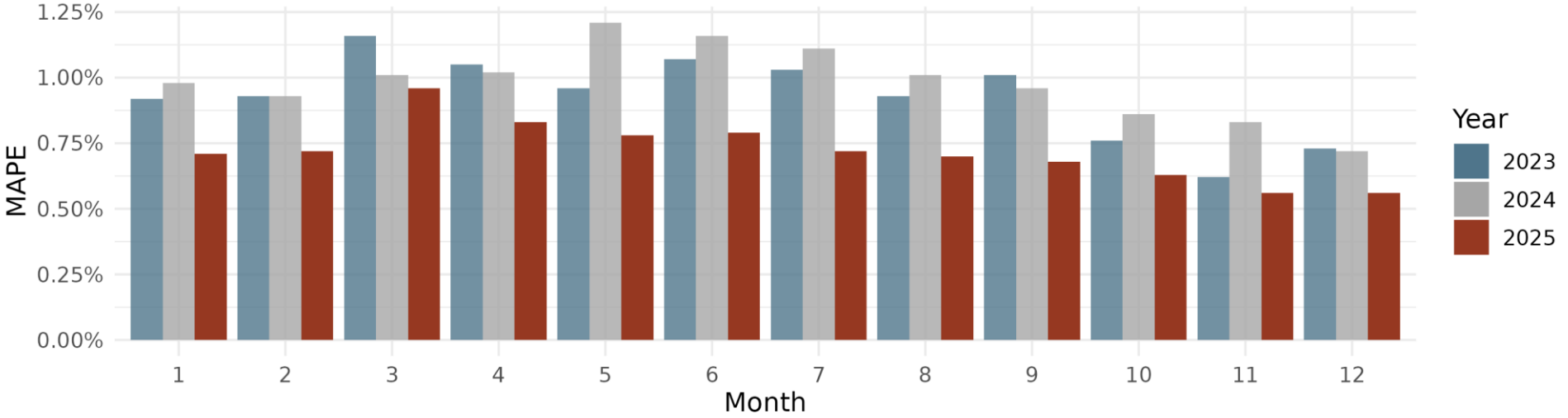


*MAPE = abs(Forecast – Actual)/Actual
**MAPE only calculated for intervals where Forecast > 0

DA wind forecast



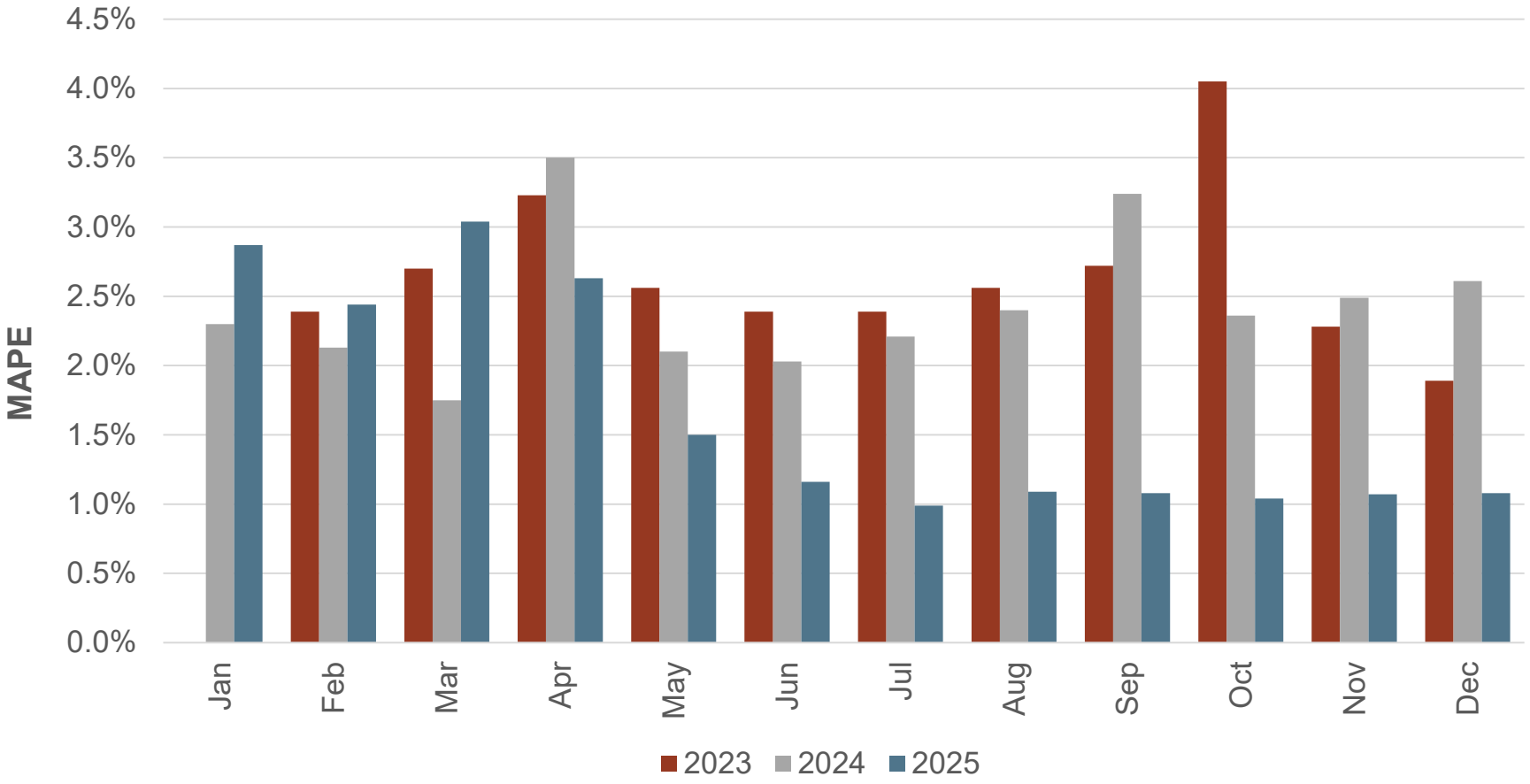
RTD wind forecast



*MAPE = abs(Forecast – Actual)/Actual

Real Time Solar Hybrid Performance

*Comparison of DOT to MW Production



*MAPE = abs(DOT – Actual)/Capacity