California ISO

Market Performance and Planning Forum

Q4

December 12, 2024

Forum Reminders:

- This quarterly forum that engages stakeholders in review of market performance issues and in high level dialogue on release planning, implementation and new market enhancements. This is intended to foster open dialogue and sharing of ideas and perspectives
- This call is being recorded for informational and convenience purposes only. Any related transcriptions should not be reprinted without ISO's permission.
- The meeting is structured to stimulate dialogue and engage different perspectives.
- Please keep comments professional and respectful.
- Please try to be brief and refrain from repeating what has already been said so that we can manage this time efficiently.

Instructions for raising your hand to ask a question

- Open the Participant and Chat panels from the bottom right.
- 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.
  - **Note**: *3 only works if you dialed into the meeting.

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

- You may also send your question via chat to either **Brenda Marquez** or to all panelists.

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

Objective: Enable dialogue on implementation planning and market performance issues

- Review key market performance topics
- Share updates to 2024-2025 release plans, resulting from stakeholders inputs

Market Performance and Planning Forum

Agenda – Dec 12, 2024
9 a.m. – 12 p.m. (PST)

Time:	Topic:	Presenter:
09:00 – 09:05	Introduction, Agenda	Brenda Marquez, Stakeholder Affairs
9:05 – 11:00	Market Performance Update	Market Performance and Advanced Analytics Short Term Forecasting
11:00 – 11:30	Policy Update	Becky Robinson, Market Policy Development
11:30-12:00	Release Update	Trang Vo, Project Management
	2025 MPPF Schedule	Brenda Marquez, Stakeholder Affairs

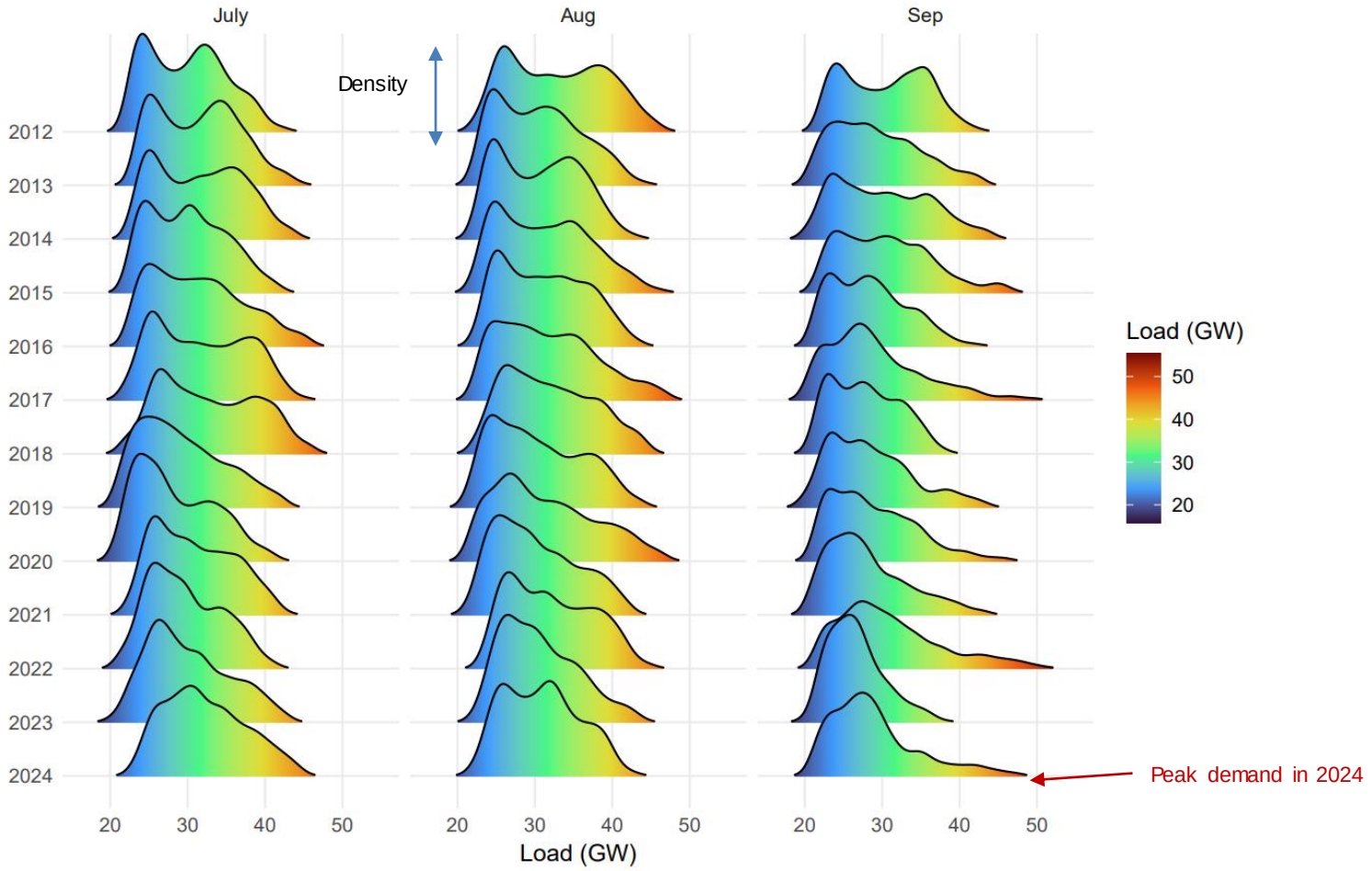
Market Update

Agenda for Market Update

- September 2024 market performance
- Shaping factor enhancement
- Market issues
- Load conformance
- Flexible ramping product
- Energy storage resources
- Gas and power prices
- Wholesale market costs
- General market performance metrics

July 2024 Market Performance

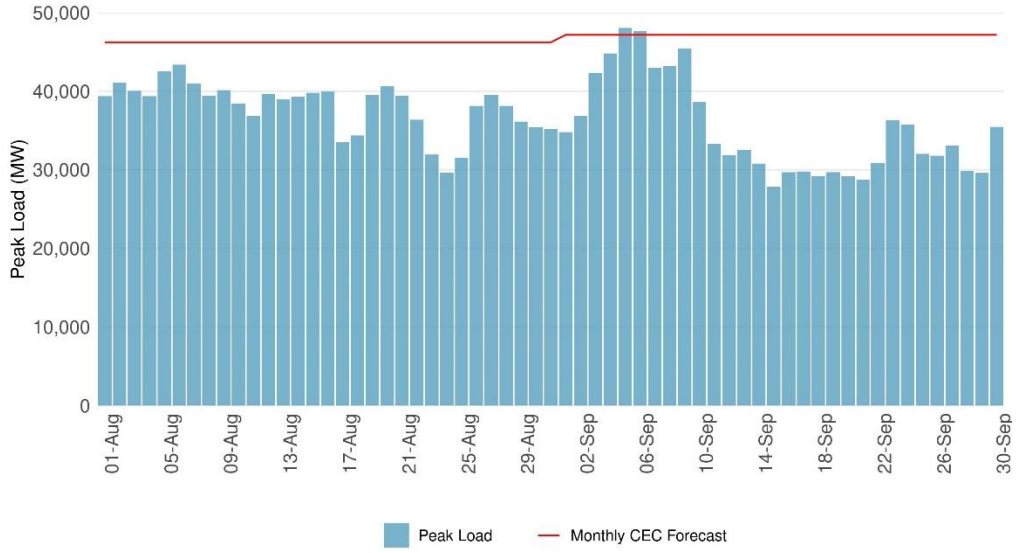
The CAISO's load peak occurred on September 5 at 48,353 MW



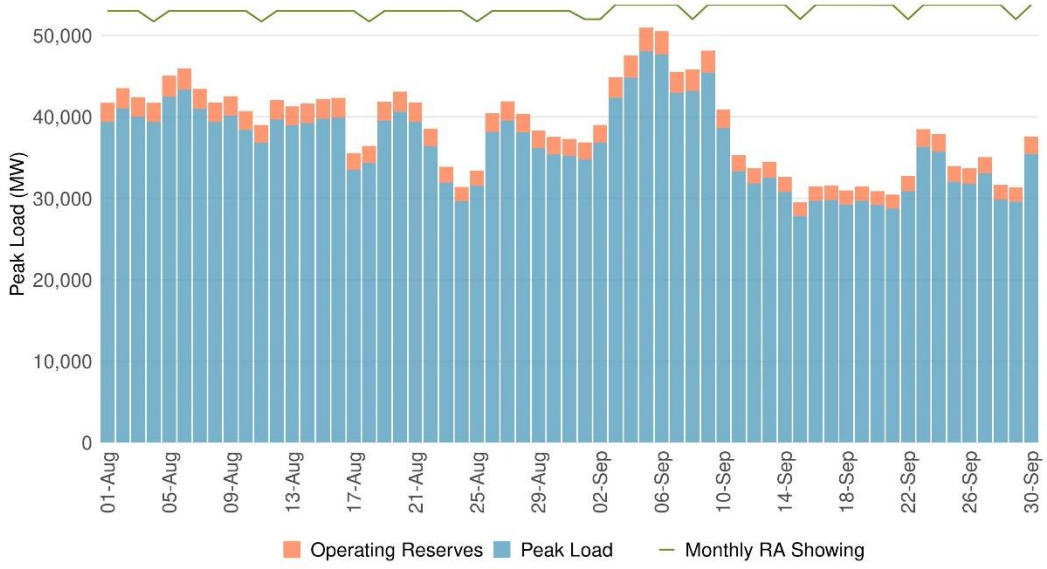
The peak in 2024 was still significantly below the all-time record of 52,061 in 2022

CAISO's loads in September reached the highest level in the year

The CAISO's load peak happened on September 5 at 48,353 MW, higher than the CEC forecast of 47,160 MW

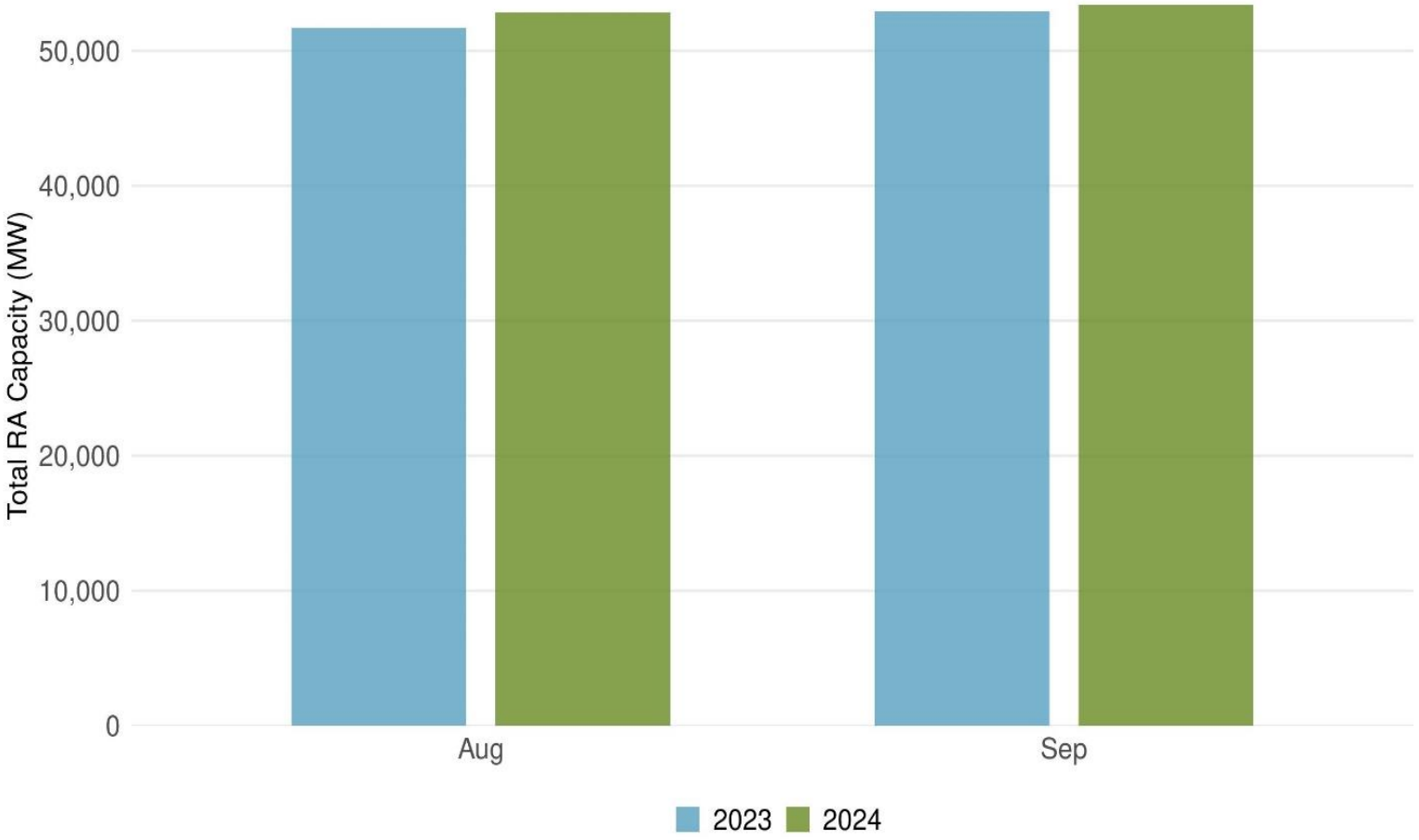


The monthly RA showings were sufficient to cover CAISO's load plus operating reserves in September

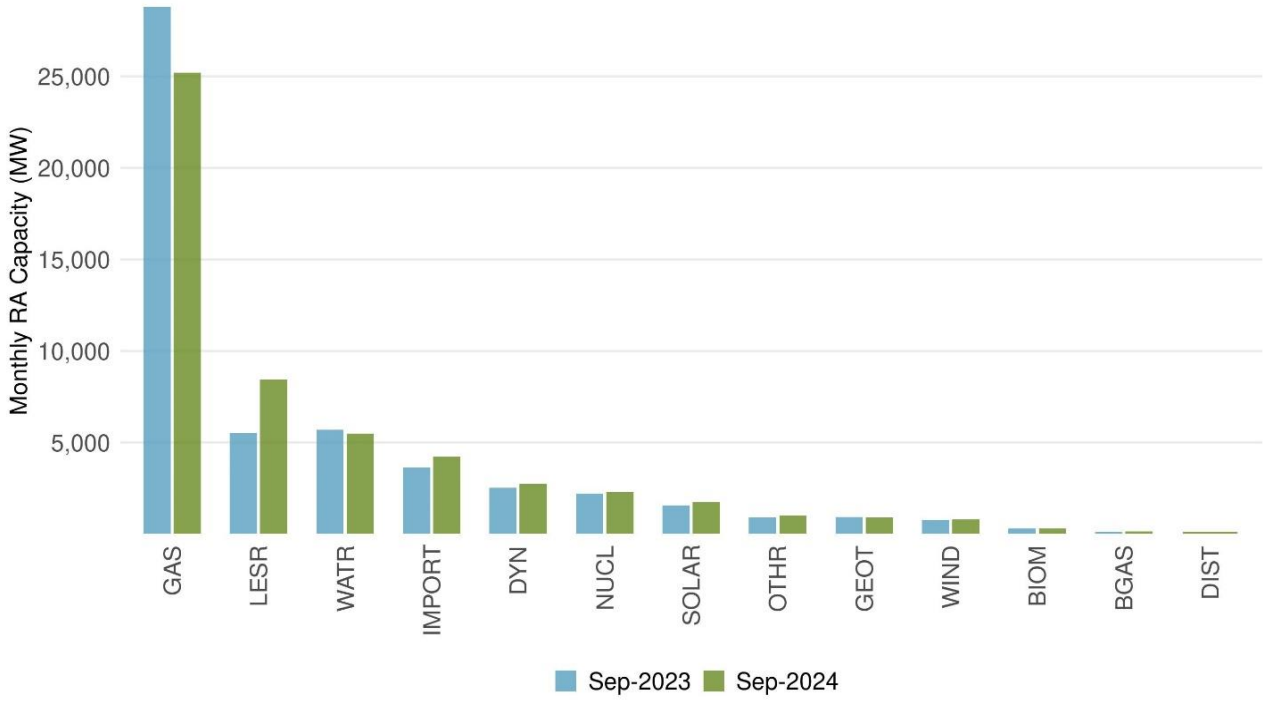


California ISO

The monthly RA showing for September 2024 was 53,403 MW, which was slightly higher than September 2023's monthly showing of 52,920MW



The RA composition for the monthly RA showings for July 2024 saw moderate changes relative to July's 2023



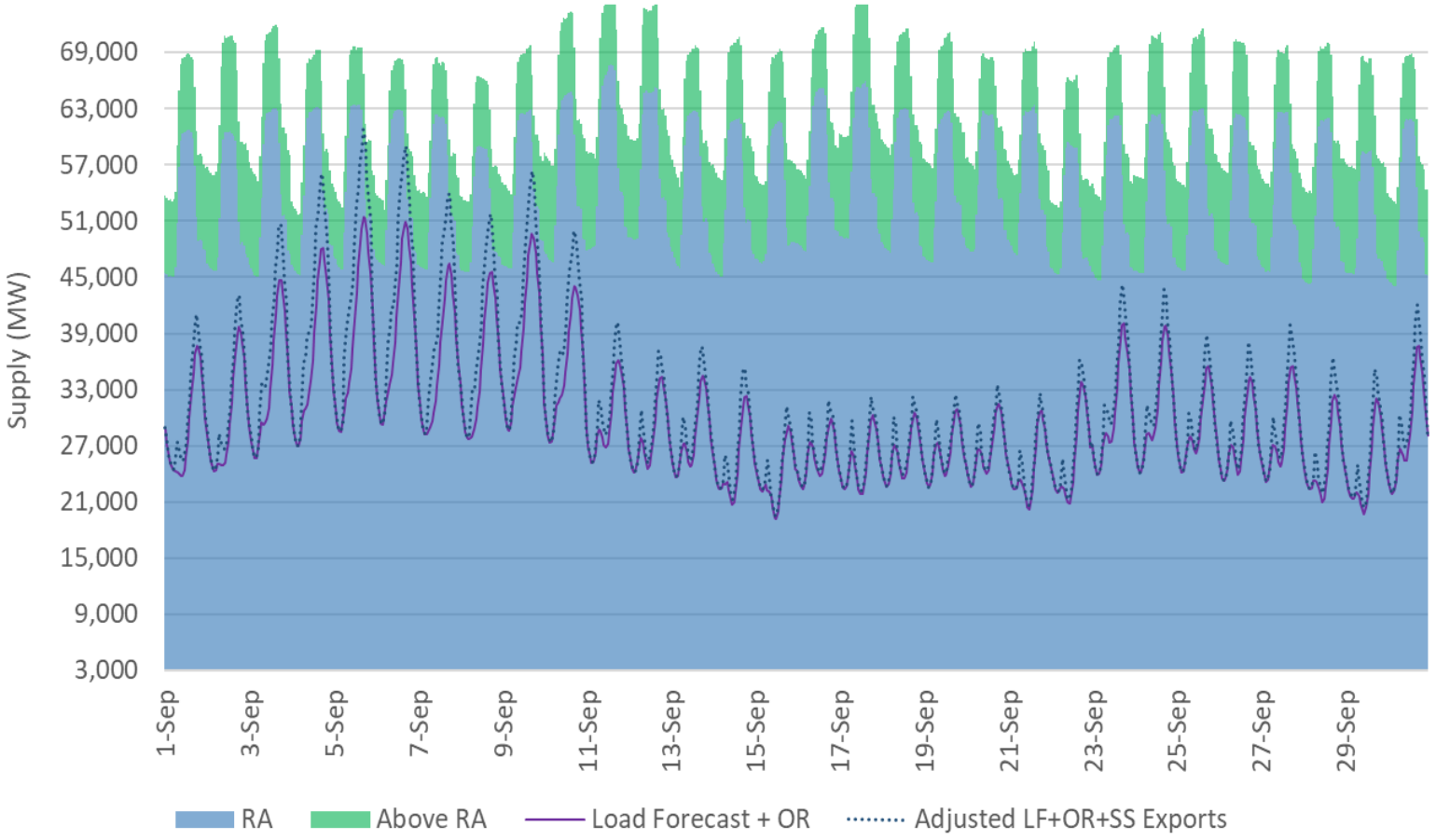
Gas: -3,593 MW

Hydro: -206 MW

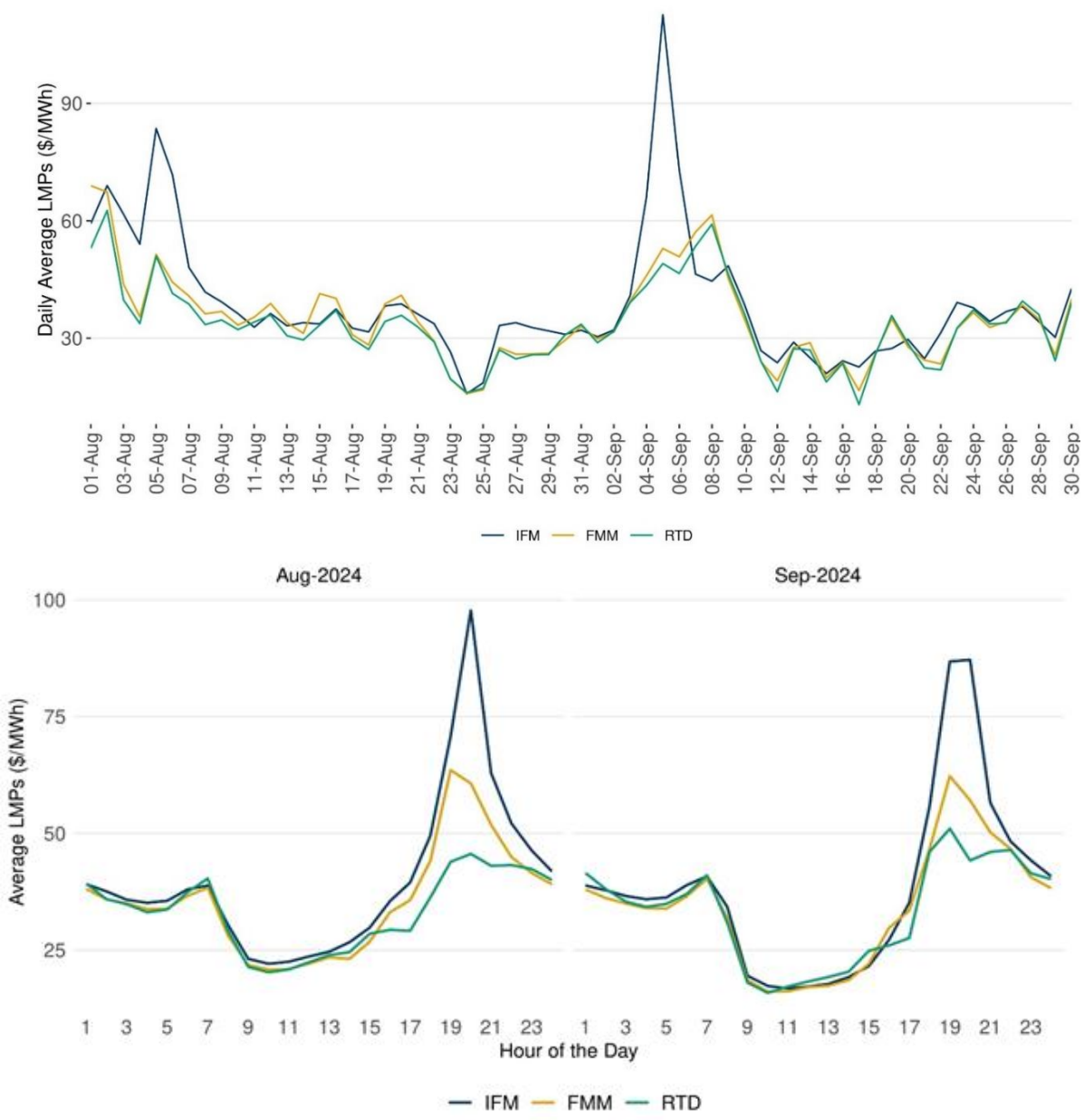
Storage: +5,500 MW

Imports: +613 MW

RA capacity was sufficient in September to meet load needs, including September 5 when CAISO observed the monthly peak load



CAISO prices increased in early September, reaching maximum levels on September 5 when system reach peak conditions



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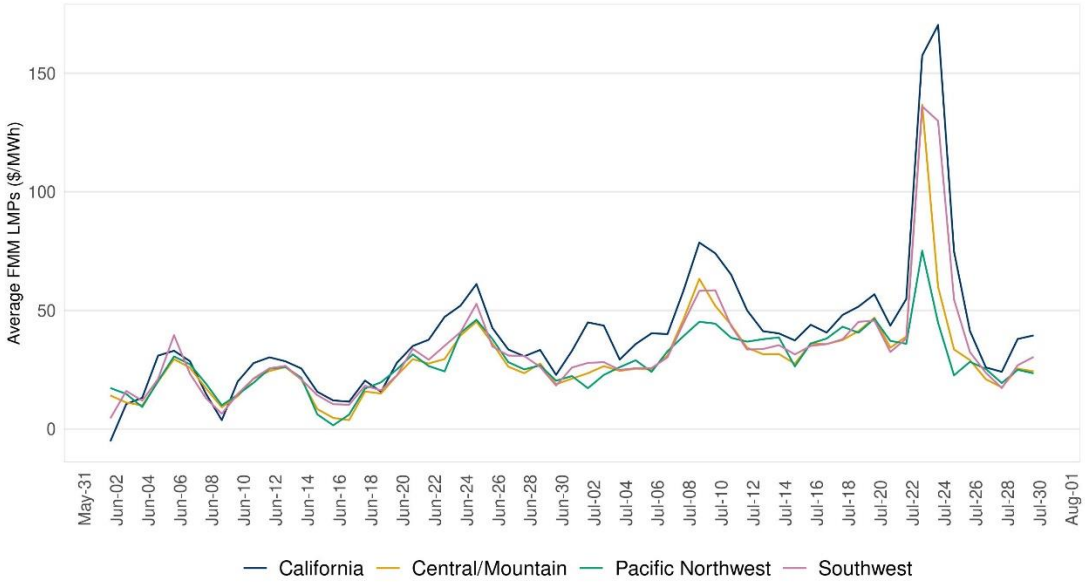
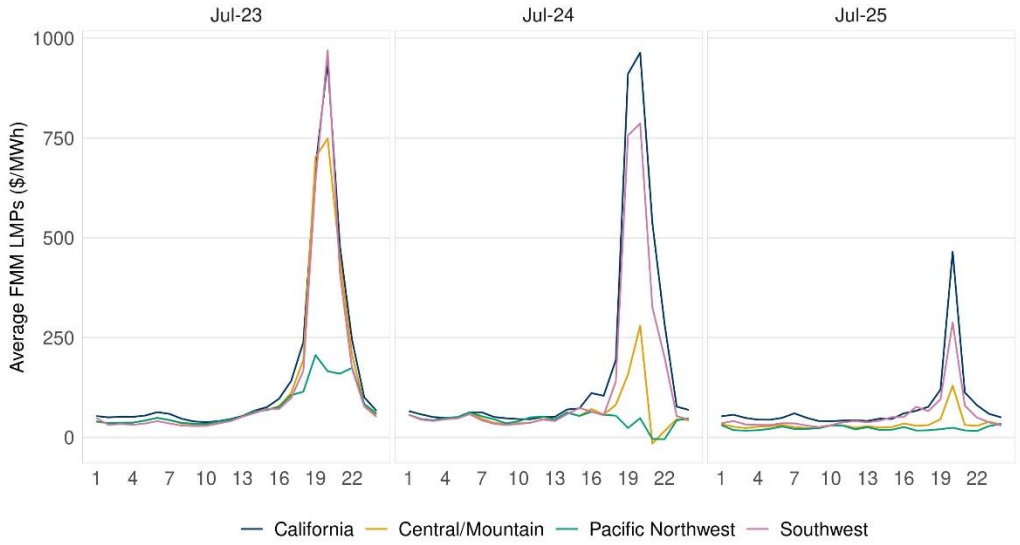
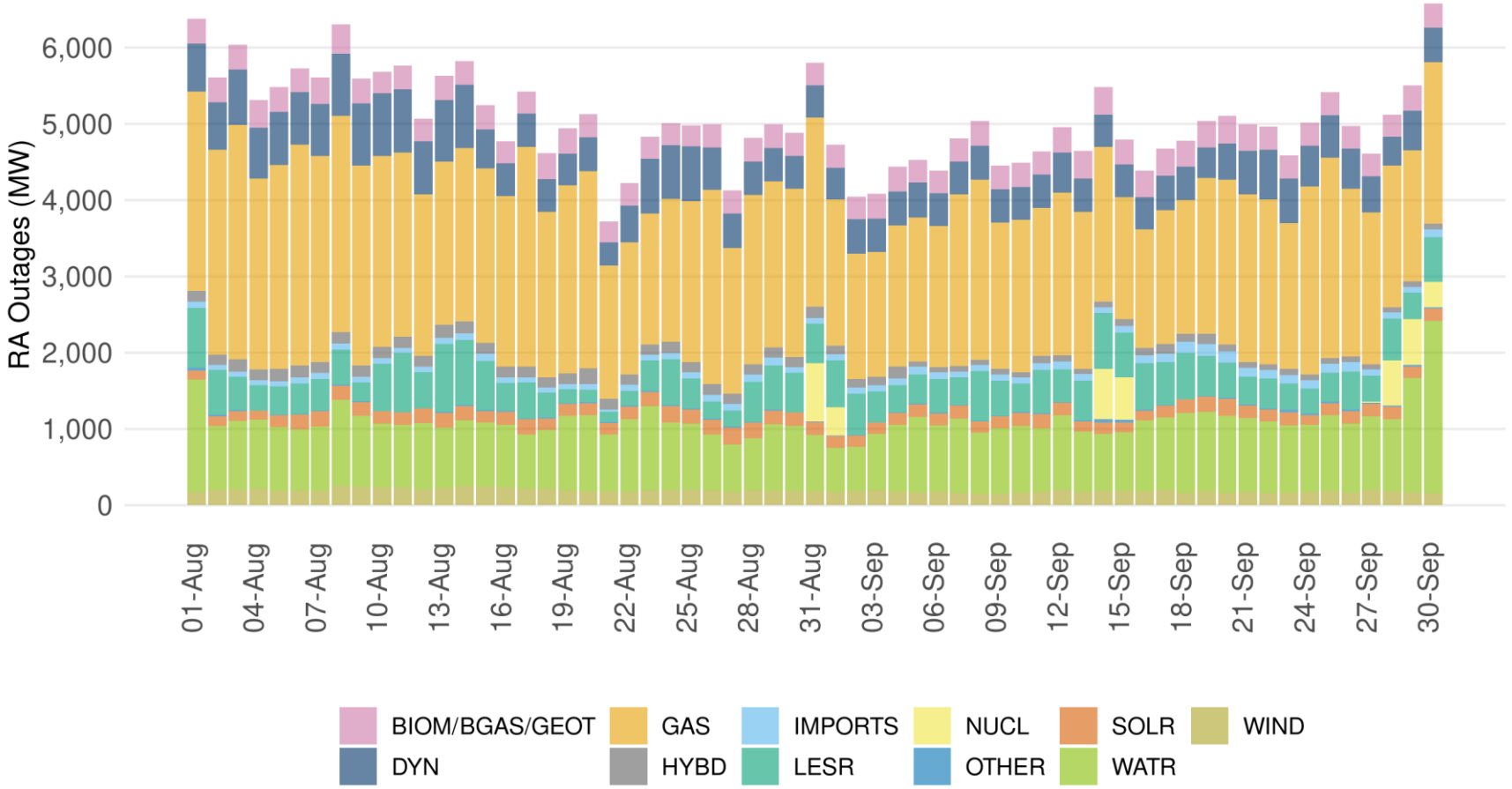
Prices in the imbalance market exhibit similar trend with maximum levels on July 24



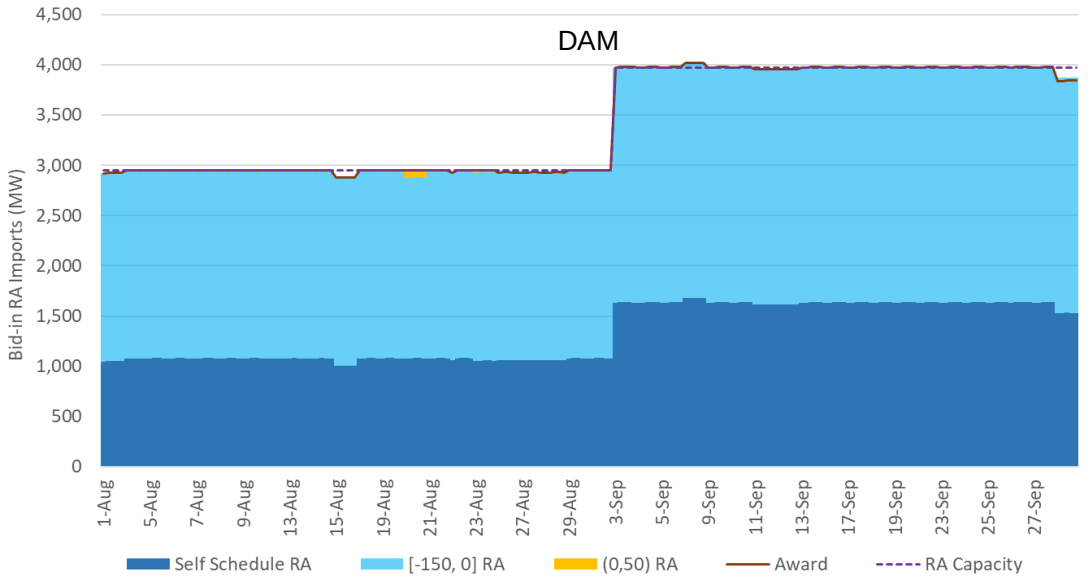


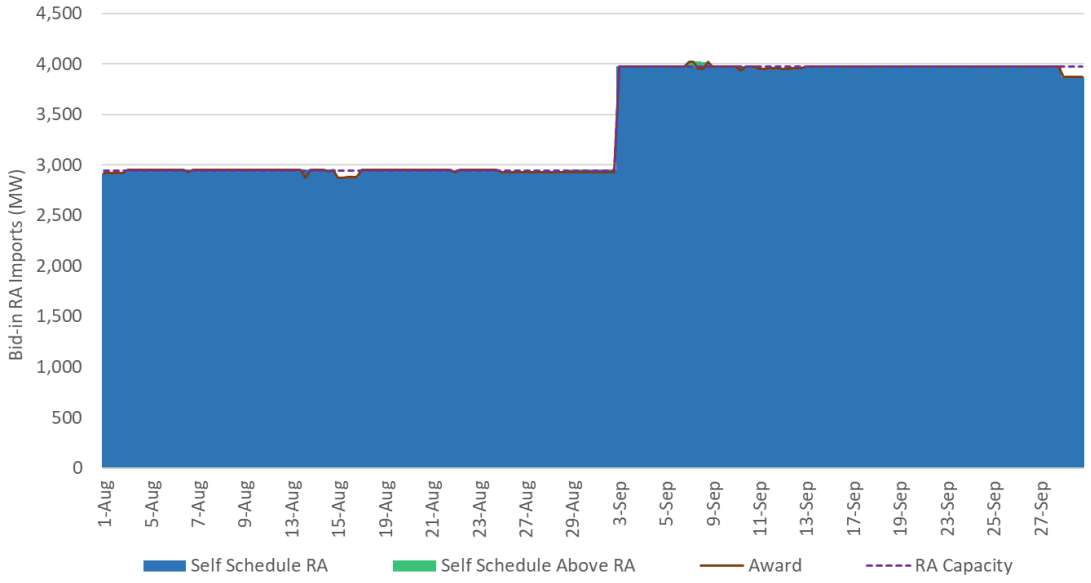
Average daily resource-adequacy capacity on outage was within typical ranges, on average, at about 5,400 MW



About 99.9 percent of RA imports bid in at or below $0/MWh in September

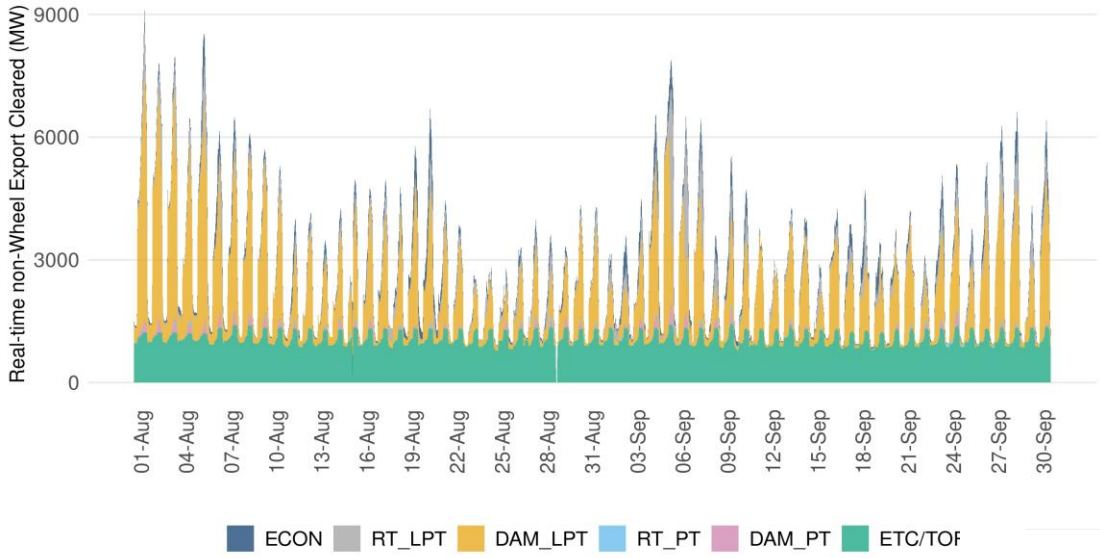
The majority of imports with self schedules or bids at or below $0 were cleared in both the day-ahead and real-time markets





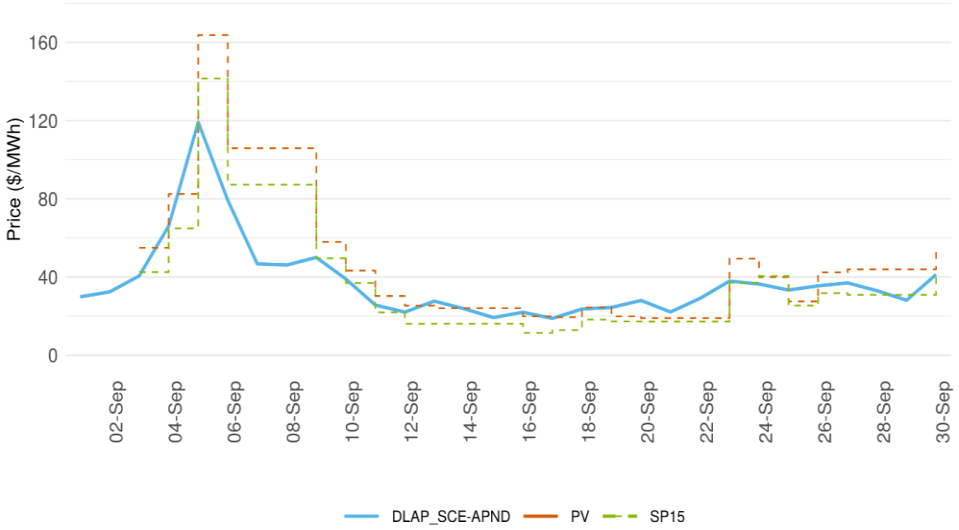
California ISO

High volume of exports observed in early September driven by high loads across the west

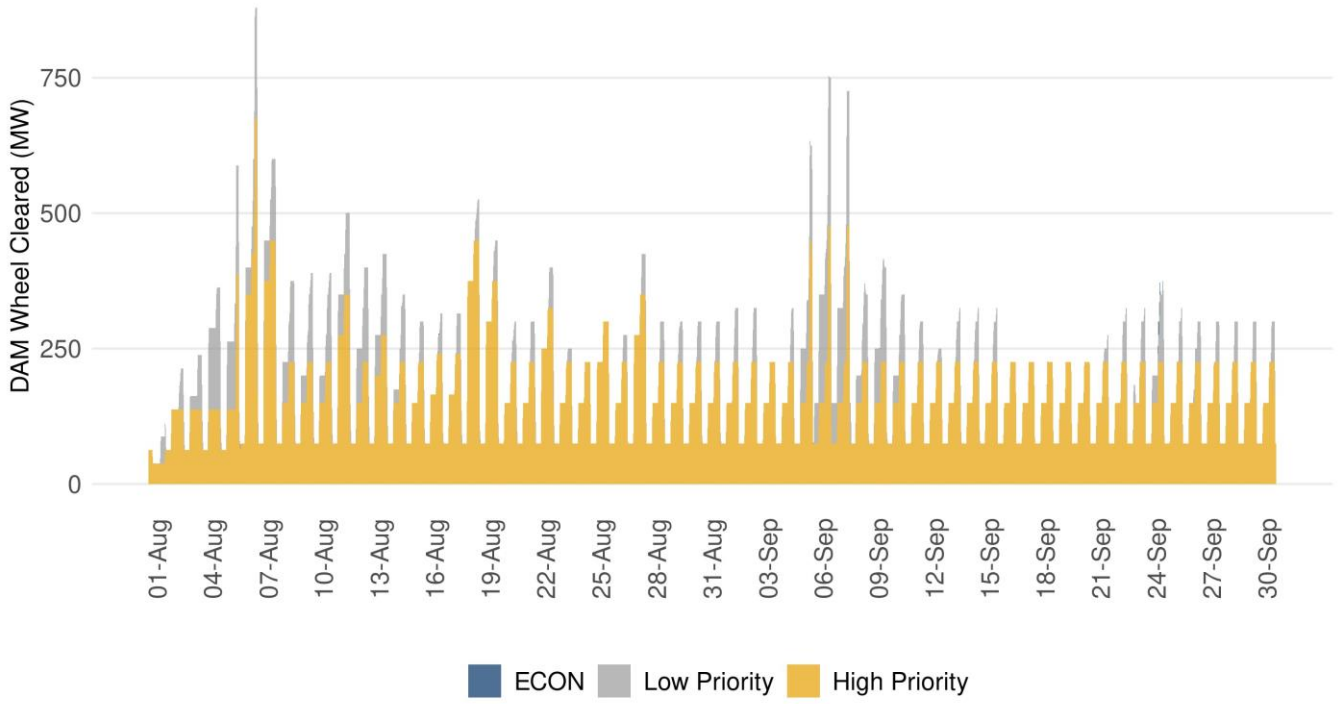


The majority of exports were self schedules bid in the day-ahead market

The ISO area's average prices were generally lower than external bilateral prices. As expected, exports from the lower priced CAISO area cleared, to serve high demand outside of the balancing area.



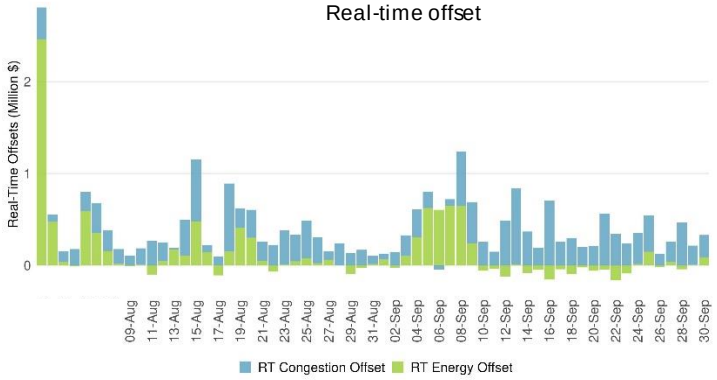
A maximum of 510 MW of high-priority wheel-through transactions were bid in and cleared in the market in September

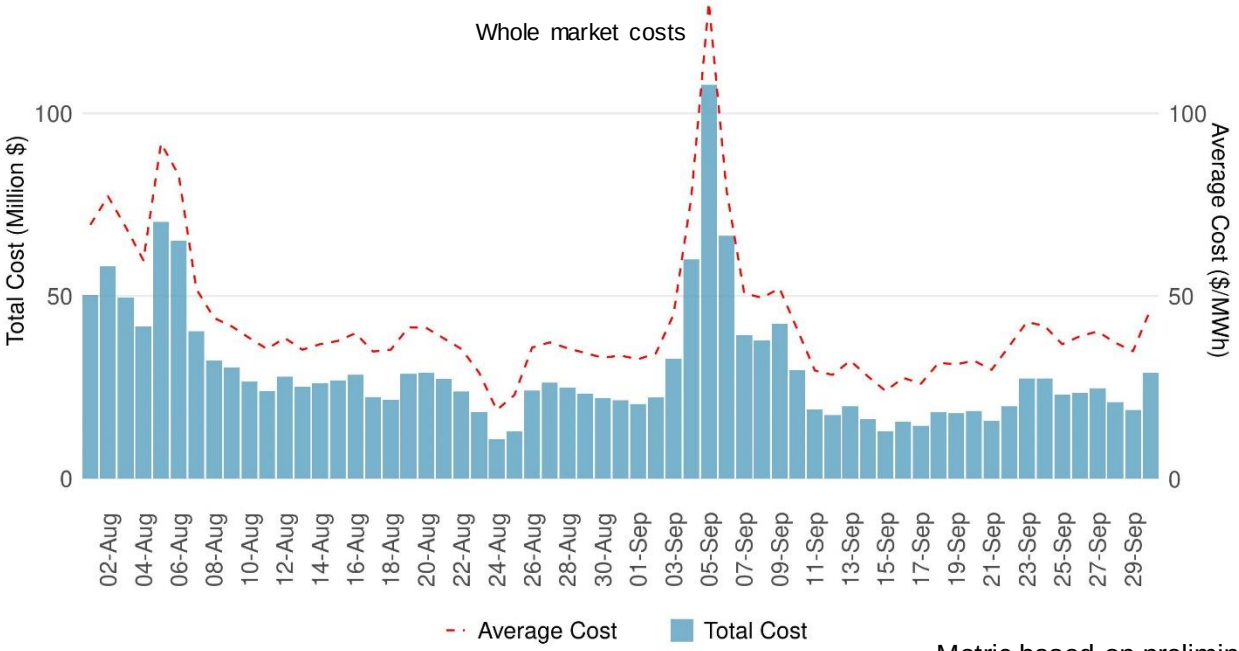


No wheel-through transactions were curtailed in September

There were also modest level of low-priority wheel-through transactions participating in the CAISO market

Average CAISO daily wholesale cost in September was about $28.5 million with the highest at $108 million on September 5

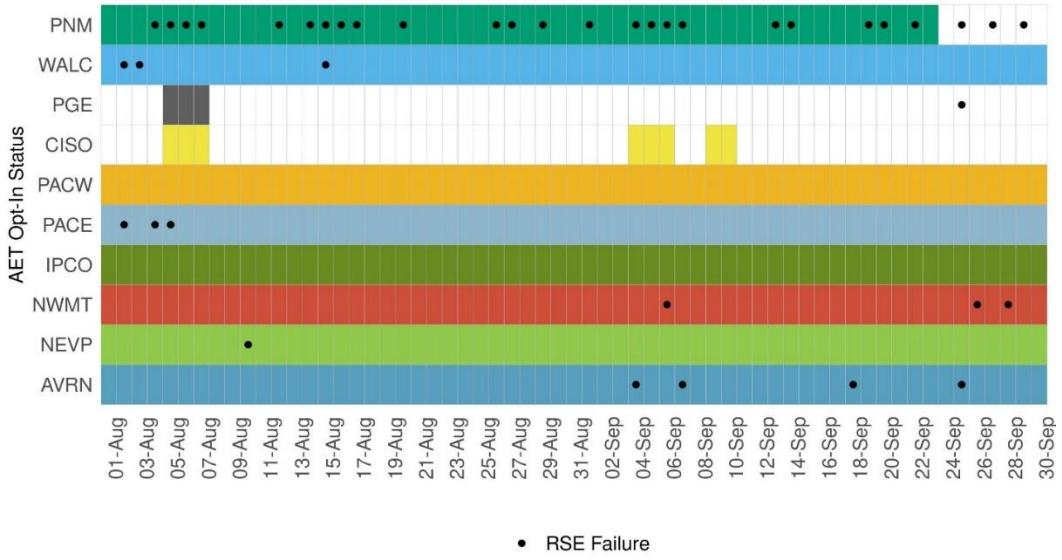




Metric based on preliminary settlements data and subject to updates

The WEIM facilitated balancing area access to assistance energy transfers, providing operational benefits

- There were nine WEIM balancing areas opting into the assistance energy transfer (AET) program in September, the largest participation since its inception
- This program allows areas to receive energy transfers when they do not meet resource sufficiency requirements
- The total AET surcharges assessed in August and September were approximately $720,000 for all the BAAs that opted in



Shaping Factor Enhancement

Background on FERC Order No. 831 – Import Bidding and Market Parameters initiative

- FERC Order No. 831 (2016)[1] directed ISOs/RTOs to allow cost-verified energy bids above $1,000/MWh up to $2,000/MWh
- CAISO opened the stakeholder initiative titled "FERC Order 831 – Import Bidding and Market Parameters"[2] to comply with the order
  - The Max Import Bid Price (MIBP) calculation was a way to screen import/virtual supply bids above $1,000/MWh
  - MIBP is intended to represent prevailing energy prices outside of the CAISO area using two main bilateral power hubs: Mid-C, Palo Verde
  - Bilateral power prices are published in multi-hour blocks (on-peak and off-peak)
  - Shaping factors enable CAISO to translate block power prices into an hourly curve, reflecting the fact that CAISO prices vary hourly

1 FERC order text: https://www.ferc.gov/sites/default/files/2020-06/RM16-5-000.pdf

2 Initiative home page: https://stakeholdercenter.caiso.com/StakeholderInitiatives/FERC-Order-831-Import-bidding-and-market-parameters

The hourly energy shaping factor is used in the Maximum Import Bid Price (MIBP) calculation to scale block bilateral prices

- During the Maximum Import Bid Price Analysis Workshop on May 28, CAISO presented analysis and discussed potential improvements to the shaping factor
- Implications of the current formulation (at that time) and an enhanced formulation (literal) of shaping factor were explored and compared for high-priced historical days
- Stakeholders provided feedback regarding the formulation and application of the shaping factor
- The proposed enhancement to the shaping factor was to change the calculation for alignment of days used in the shaping factor
- The enhancement was implemented in Mid November, with new shaping factor values effective on TD 11/16/24 for the DAM

May 28 workshop: https://www.caiso.com/meetings-events/topics/miscellaneous-meetings
White paper: https://www.caiso.com/documents/whitepaper-maximum-import-bid-shaping-factor.pdf
Presentation: https://www.caiso.com/documents/presentation-maximum-import-brid-price-workshop-may-28-2024.pdf

The current hourly energy shaping factor now uses the Literal formulation derived from a literal reading of the Tariff where the days used are aligned

Current (Literal):

$$\frac{Hourly\ DA\ SMEC_{high-priced}}{Average\ DA\ SMEC_{high-priced}}$$

Previous:

$$\frac{Hourly\ DA\ SMEC_{current}}{Average\ DA\ SMEC_{high-priced}}$$

$$MIBP_i = Electric\ Hub\ Price_{TOU} * Hourly\ Shaping\ Factor_i * 1.1$$

Where:

i : hour between 1 and 24

Electric Hub Price : the maximum of Mid-C or Palo Verde bilateral index price

TOU : Time of use, peak or off-peak

1 White paper: https://www.caiso.com/documents/whitepaper-maximum-import-bid-shaping-factor.pdf

2 Presentation: https://www.caiso.com/documents/presentation-maximum-import-brid-price-workshop-may-28-2024.pdf

The current hourly energy shaping factor considers some nuanced conditions

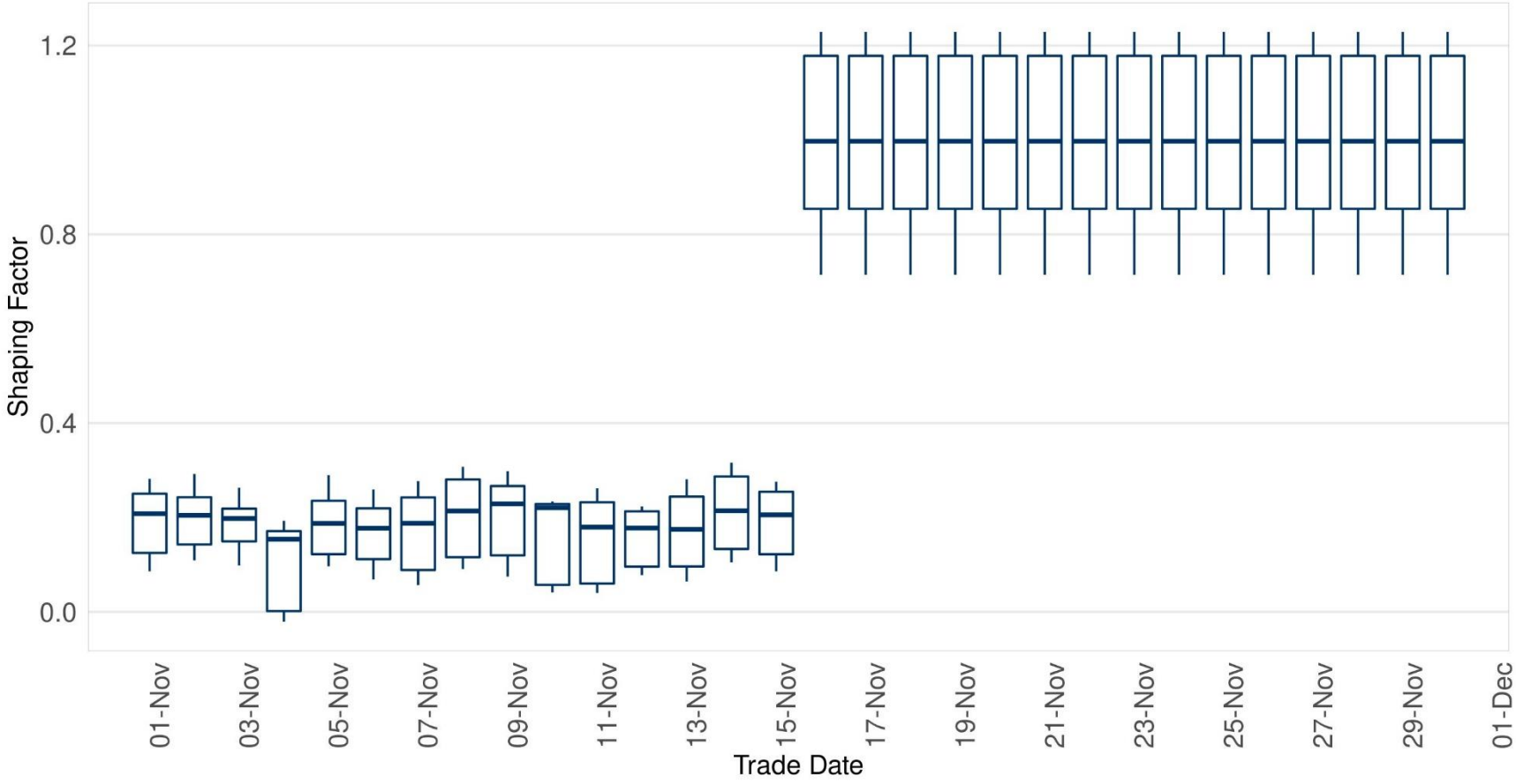
- The shaping factor is an hourly value, and there are days when the hours of the high-priced day and trading day will be misaligned
  - Daylight Savings short day (March) has 23 hours
  - Daylight Savings long day (November) has 25 hours
  - Daylight Savings change falls within Winter season (November to March) such that days before and after change have different time zone conversion
  - Days with all Off-peak hours (Sundays)

- The new logic re-aligns the high-priced day and trading day by matching the start and end times of each hour

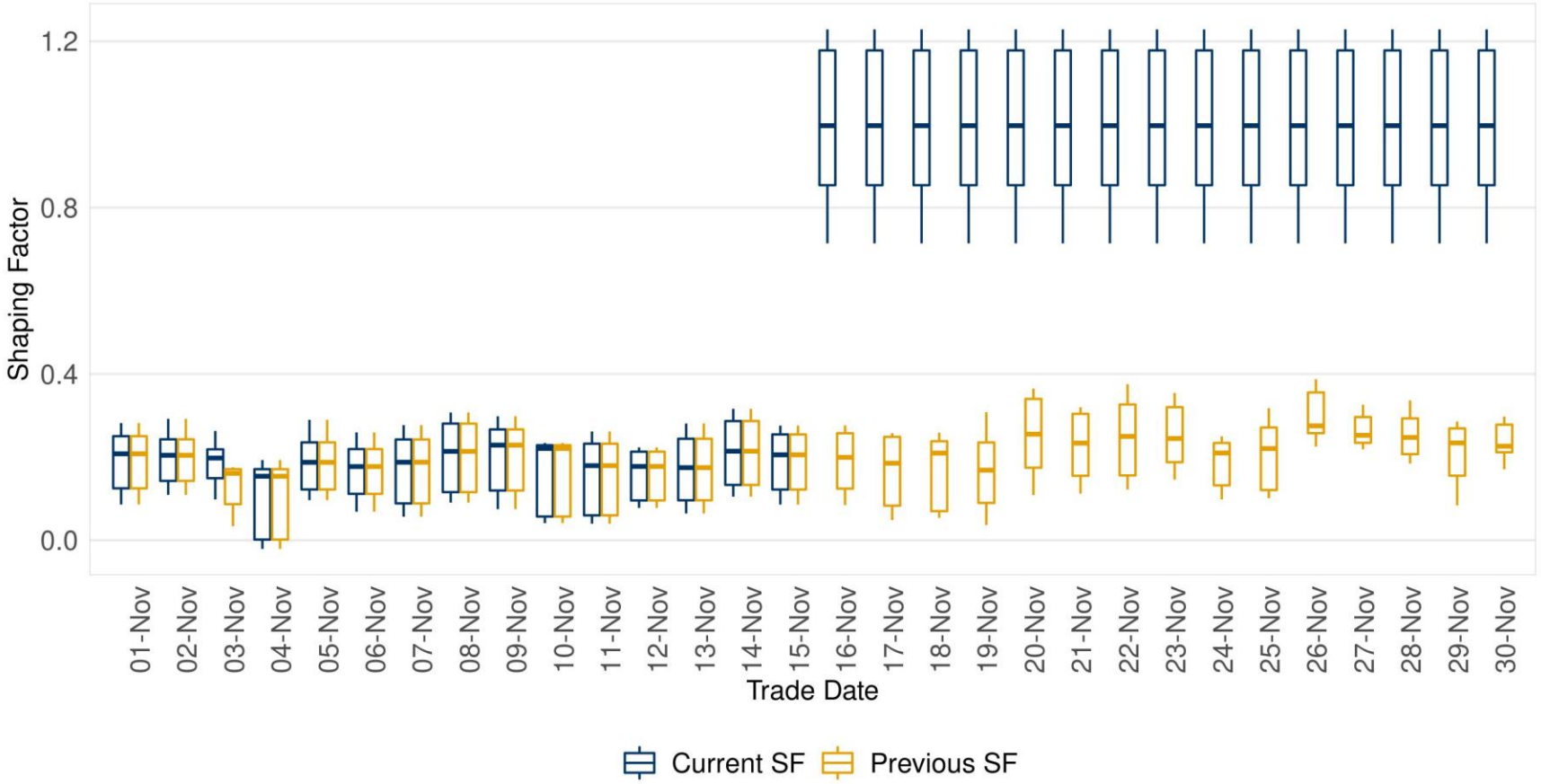
Shaping Factor and MIBP analysis for November 2024

- Current shaping factor values average to 1
- Since the enhancement was implemented, shaping factor values are higher than previous shaping factor methodology
- MIBP values are also higher as a result, since MIBP relies on the shaping factor

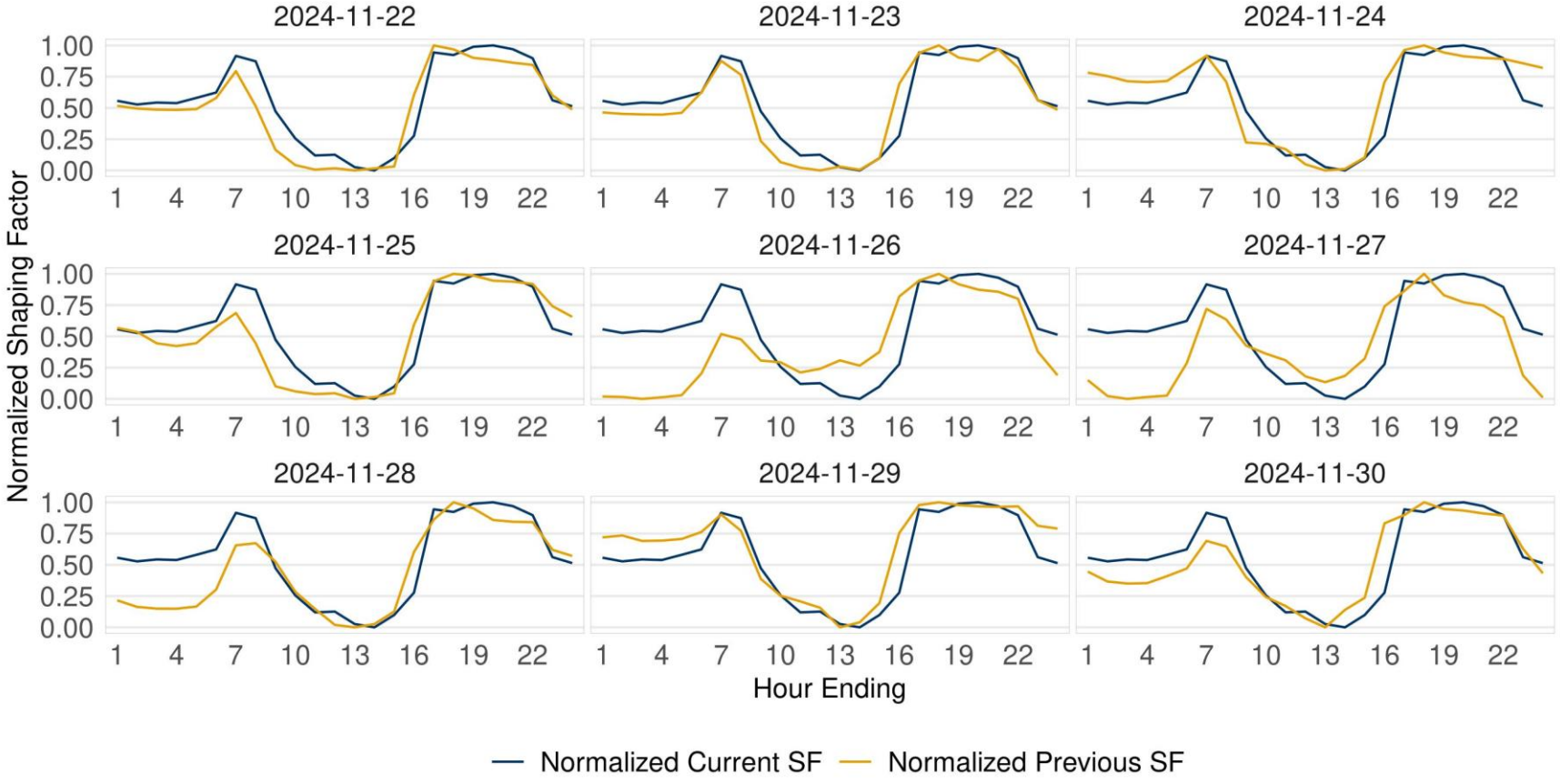
The new Shaping Factor logic went into effect on TD 11/16. The new shaping factor values average to 1



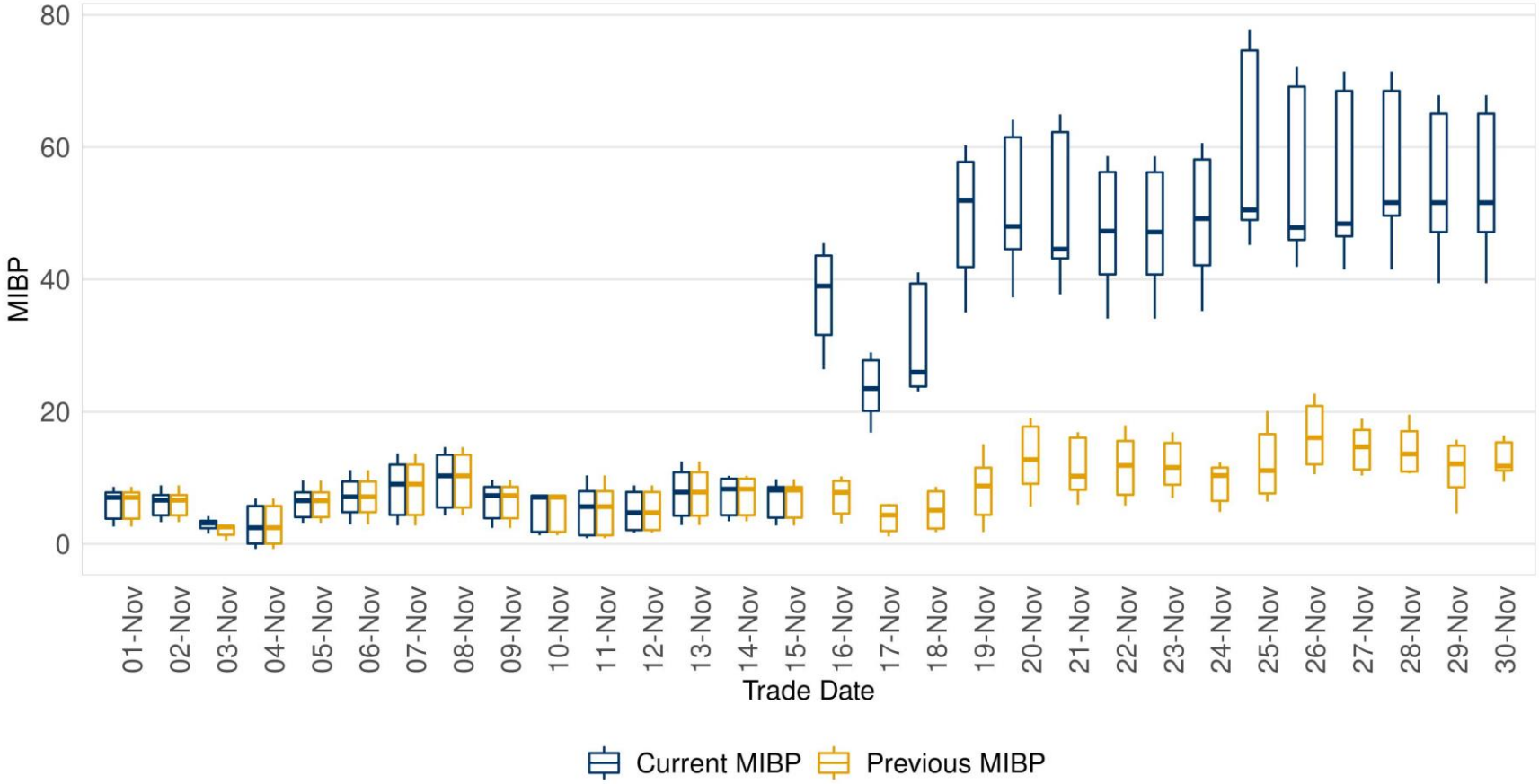
The new Shaping Factor values are higher than what the previous Shaping Factor would have been since TD 11/16



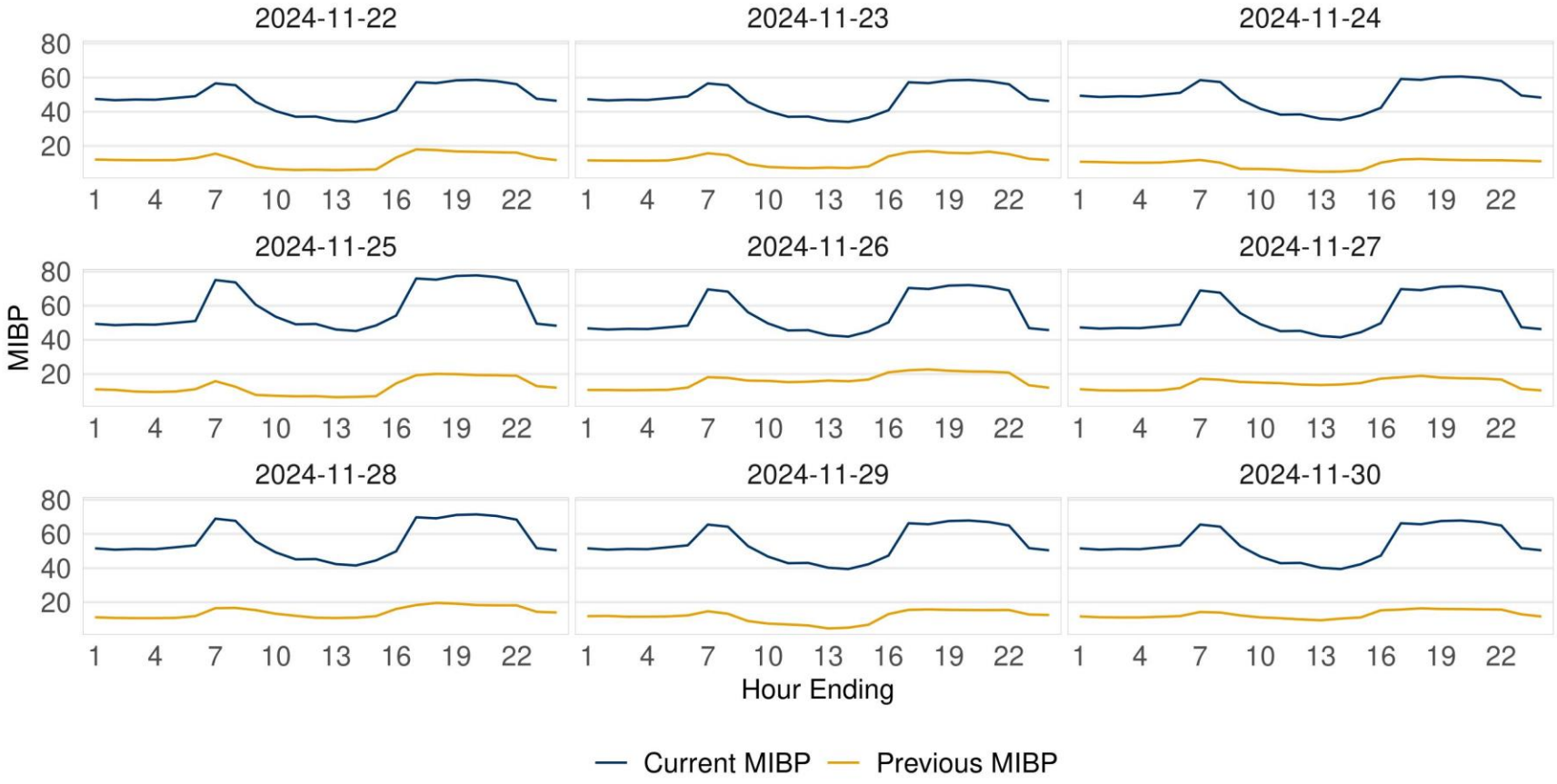
The new and previous Shaping Factor hourly trends are different as they are based on DA SMEC values from different days



Like the shaping factors, the new MIBP values were higher than what the previous MIBP values would have been since TD 11/16



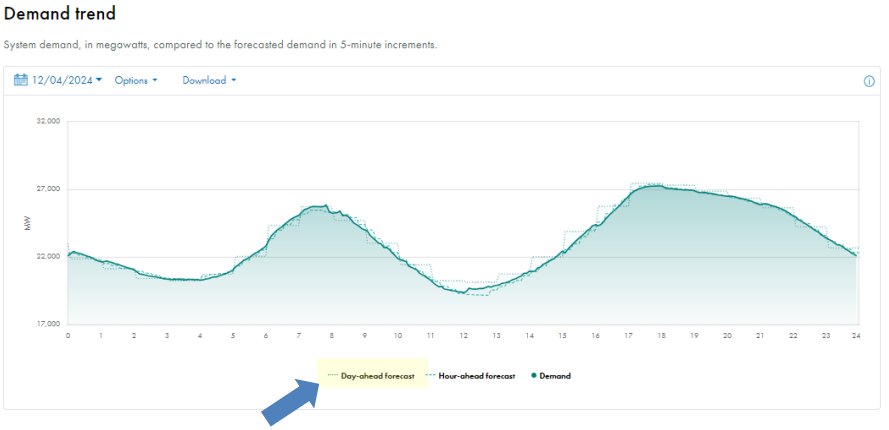
The new MIBP values were higher than what the previous MIBP values would have been

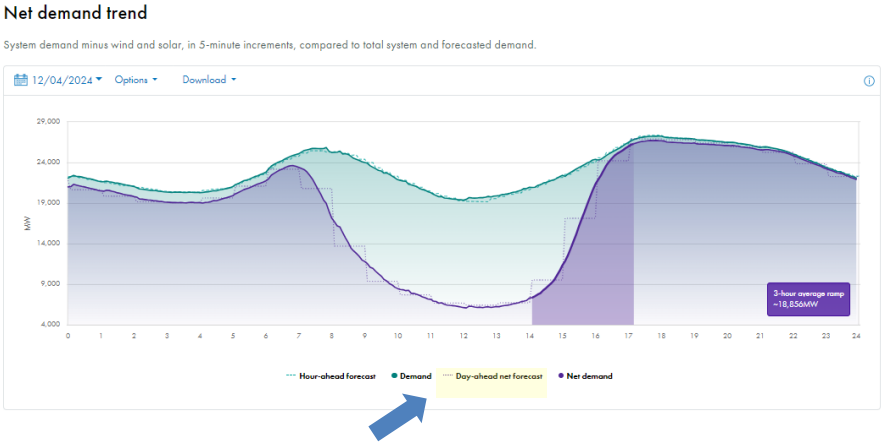


Market Issues

1. Today's Outlook DA Renewables Forecasts

- Today's Outlook displays a DA demand forecast and DA net demand forecast. The difference between the two is the total DA renewables forecast
- While the DA renewables forecast should reflect only CAISO solar and wind resources and exclude hybrids with renewable components, some MW from hybrids were erroneously included in the DA renewables forecast sum
- This issue affected DA renewables forecasts displayed in Today's Outlook only, causing differences during daylight hours. Actual values were not impacted
- A market notice will be posted when the configuration issue has been addressed.





2. Pay for Regulation Performance Compliance Issue

- Resources that provide regulation are subject to a minimum performance threshold used to assess the accuracy of the resource's response to regulation set point signals

- The minimum performance threshold methodology should apply to all intervals scheduled for regulation during a calendar month as described in Tariff section 8.2.3.1.1

- In 2022, the ISO automated certain features for regulation performance evaluations and only assessed a resource's response to regulation set point signals applying the minimum performance threshold methodology to 15 intervals instead of all intervals during a calendar month

2. Pay for Regulation Performance Compliance Issue

- The market impact is minimal since all resources that provide regulation receive accurate mileage payment settlement based on their response to setpoint signals

- The ISO performed an impact analysis and found that fewer resources received warning/decertification notices than should have as they did not meet regulation performance requirements during this time
  - From 2022-2024 if the ISO had the correct process in place, 86 resources would have received warning notices and 17 resources would have been decertified

- The ISO did not perform any retro-active de-certifications, has corrected this process and reported the issue to FERC Office of Enforcement

3. Resources coming off Regulation Early Market Issue

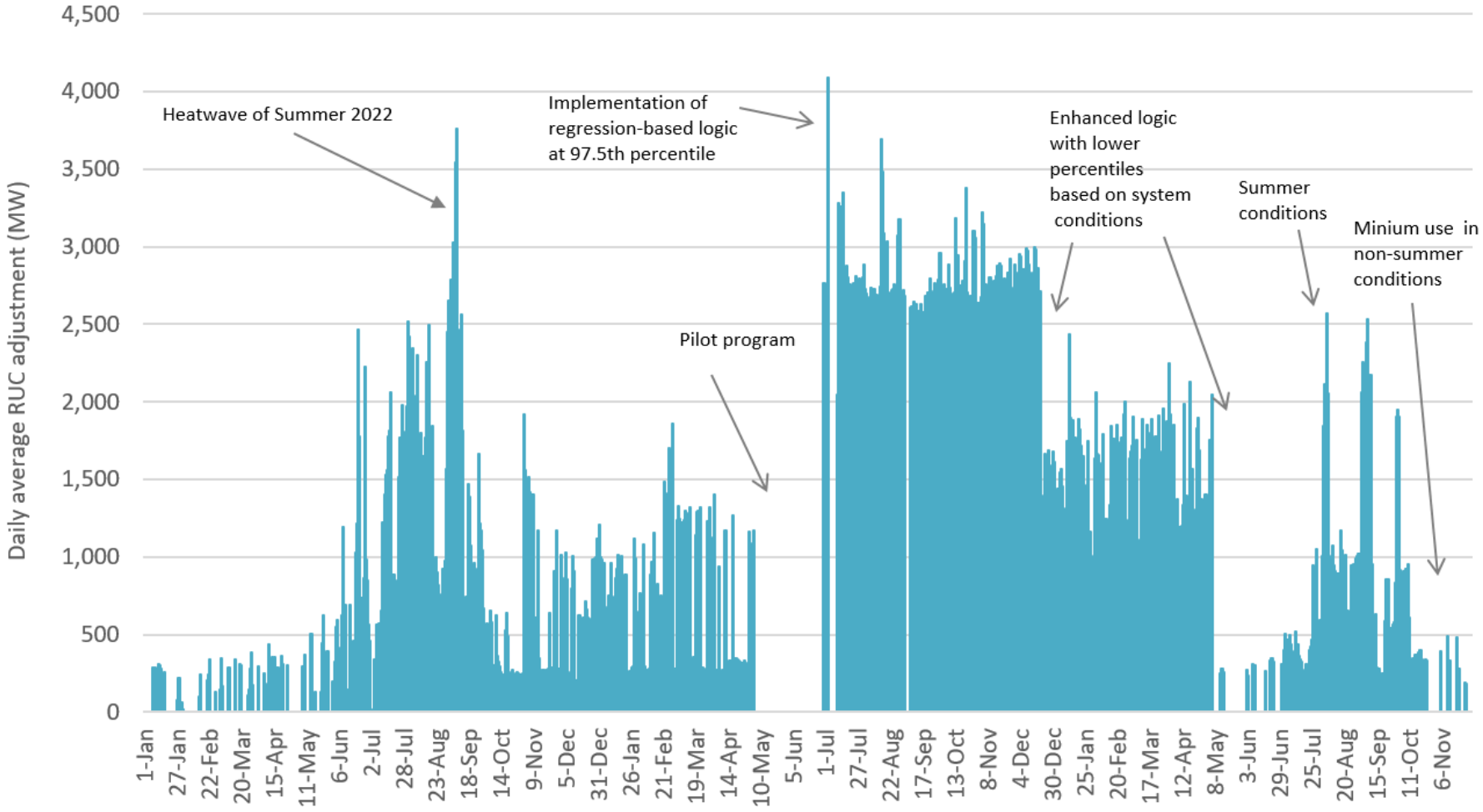
- The ISO noticed that resources providing regulation would come off Automatic Generation Control (AGC) 2-3 minutes before the end of the interval to ramp to the next DOT

- This Market Issue impacts reliability as regulation resources are needed to maintain ACE and frequency throughout the full interval awarded for regulation

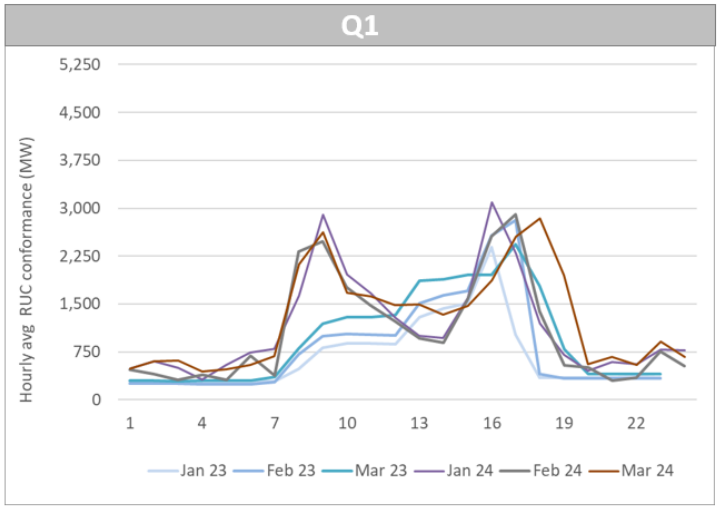
- The ISO will update the Market Operations BPM so that it is clear a resource with a regulation award must stay on Automatic Generation Control through the end of the interval and then ramp to the next DOT

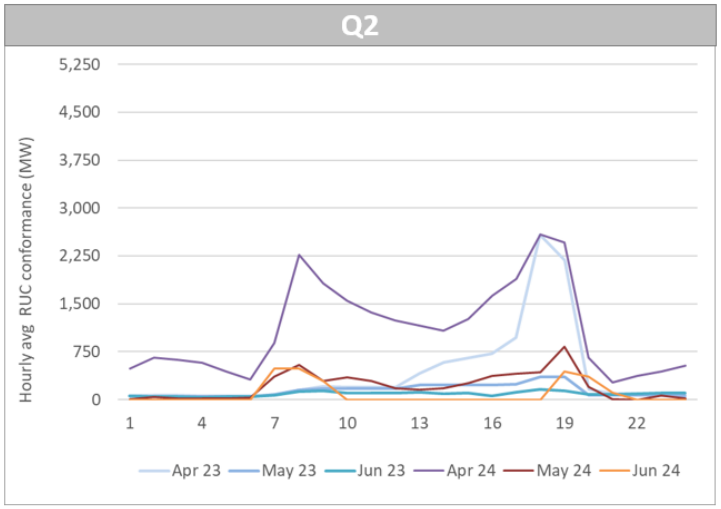
Load conformance

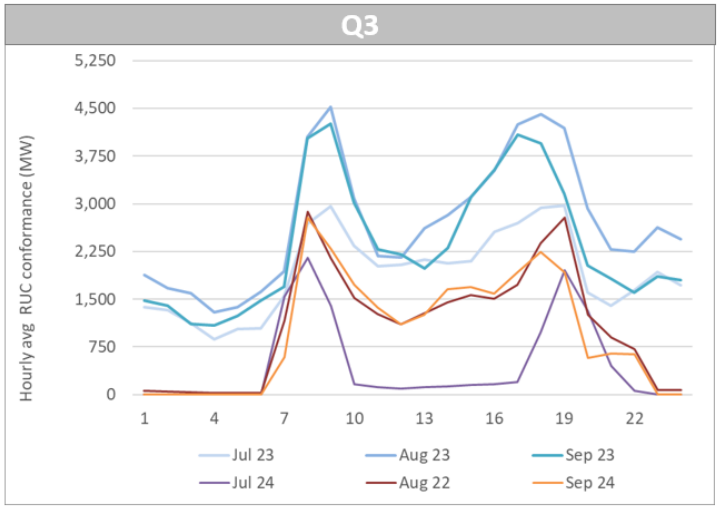
ISO's enhanced logic of RUC adjustments based on system conditions drove minimum adjustments in November

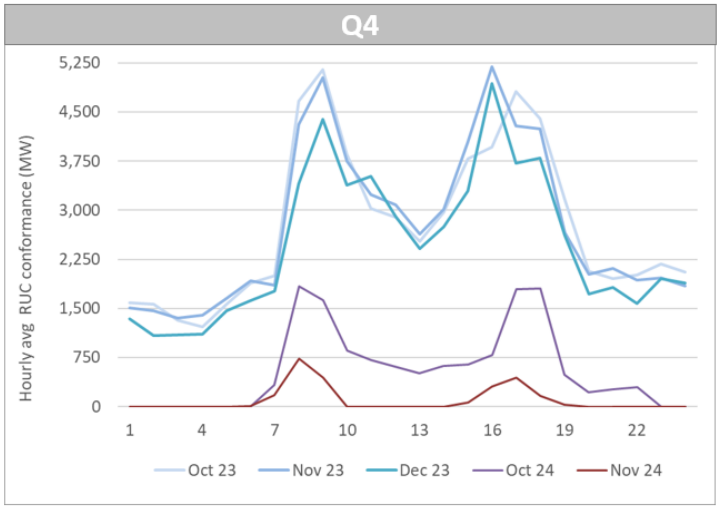


Hourly profile of RUC adjustments in Q4 2024 were minimal as summer conditions subsided

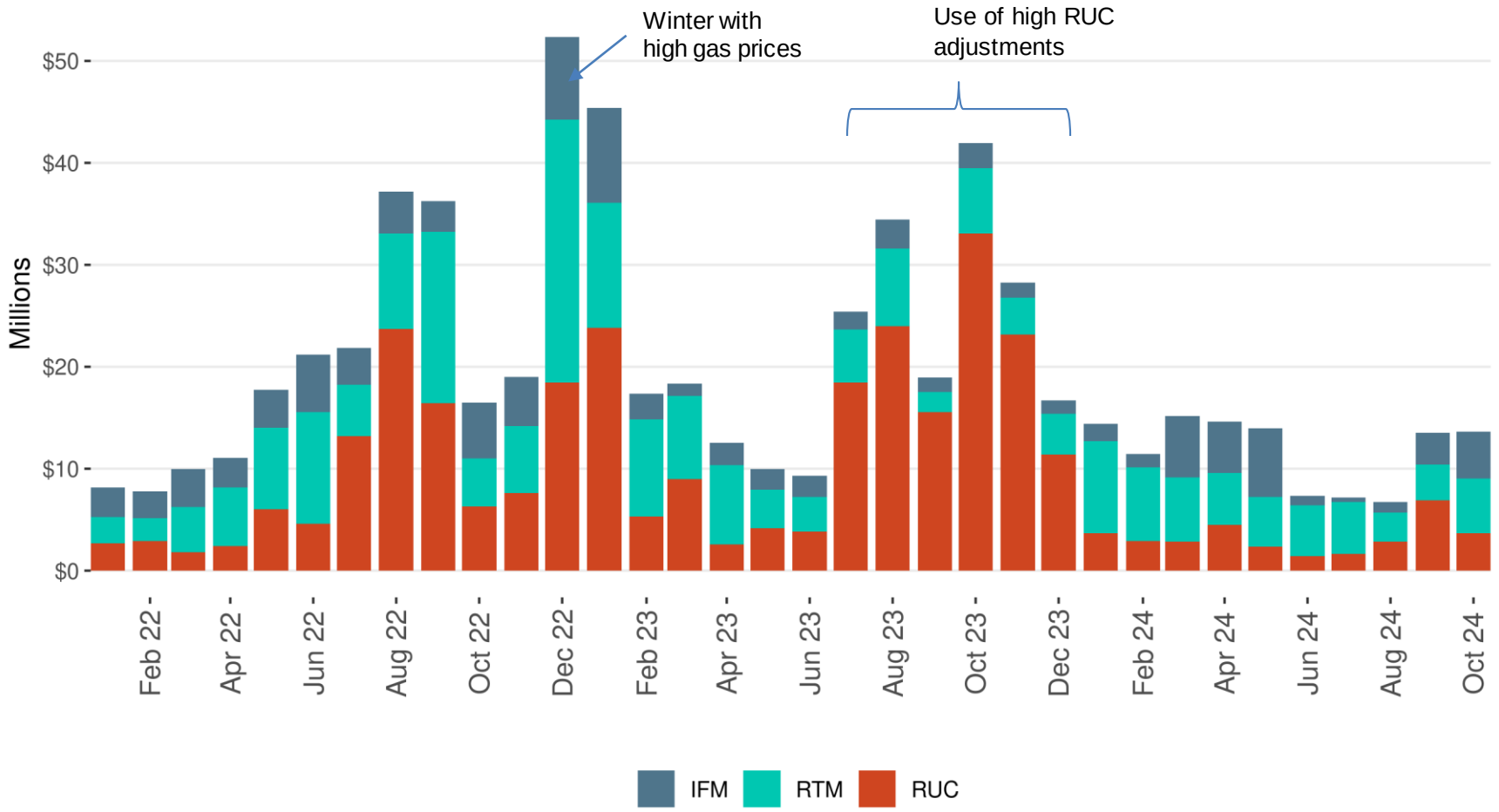




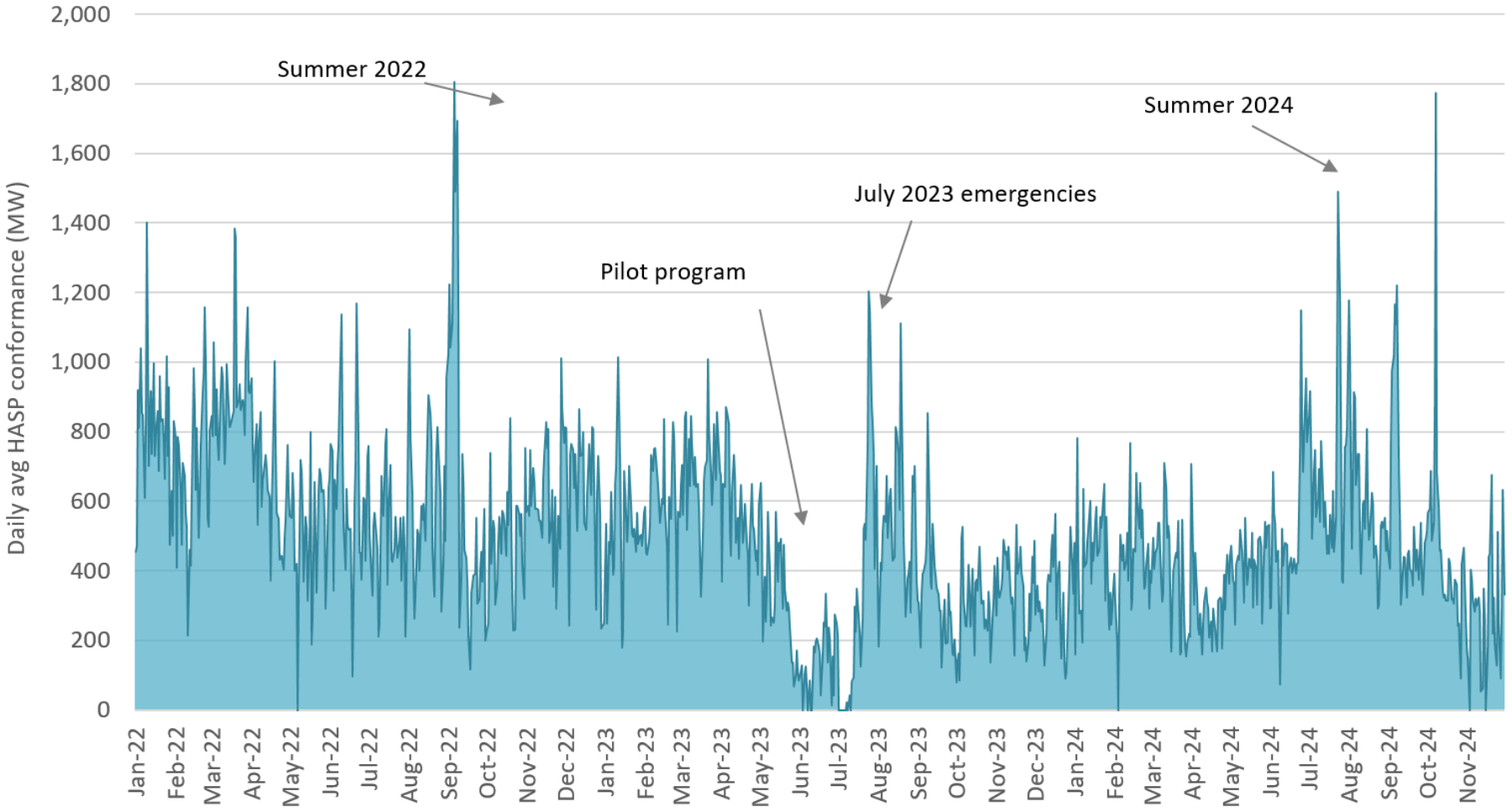




High bid cost recovery in RUC subsided since the enhancement to the requirement estimates in December 2023

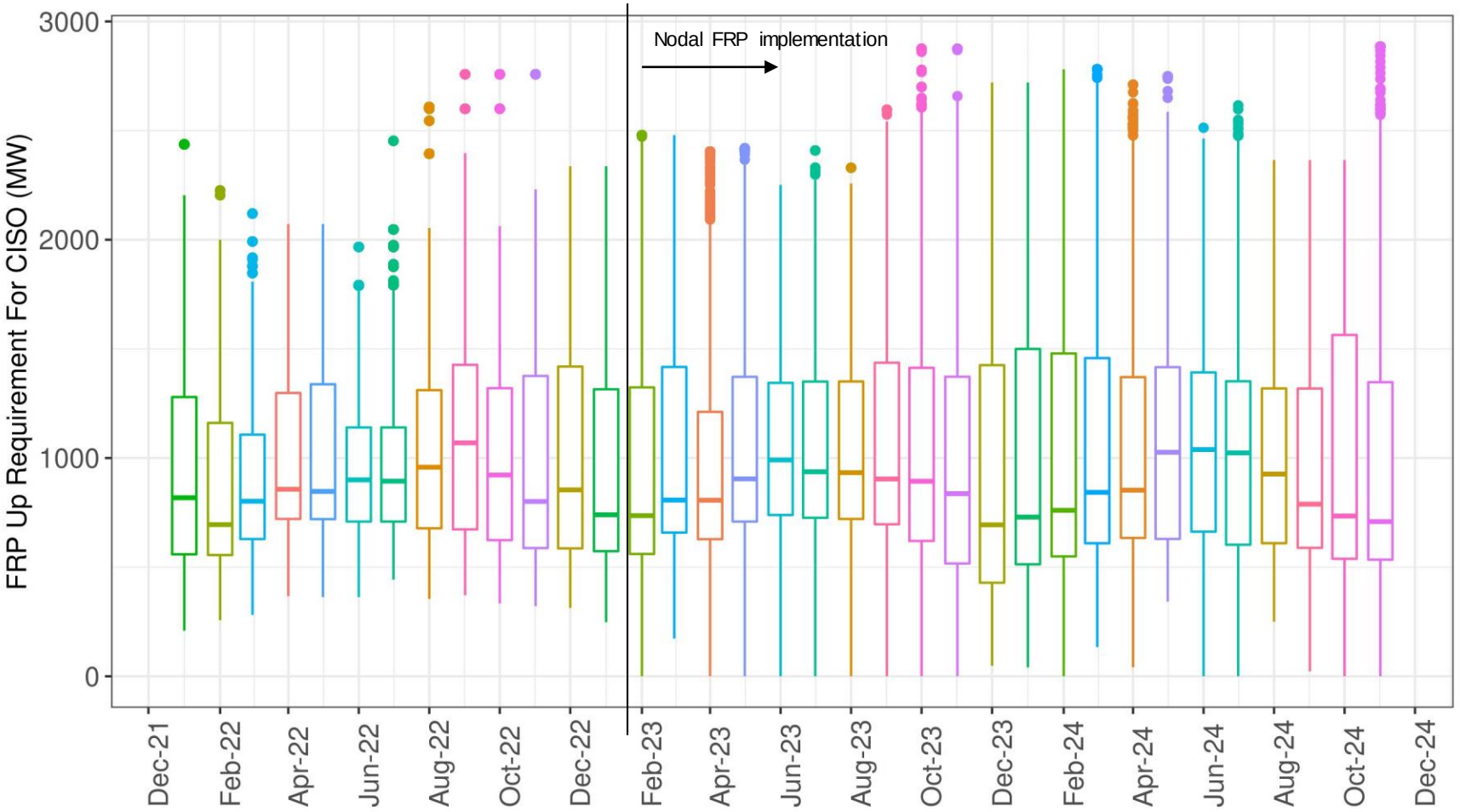


ISO continues to assess the root causes for the need to use load conformance in real time

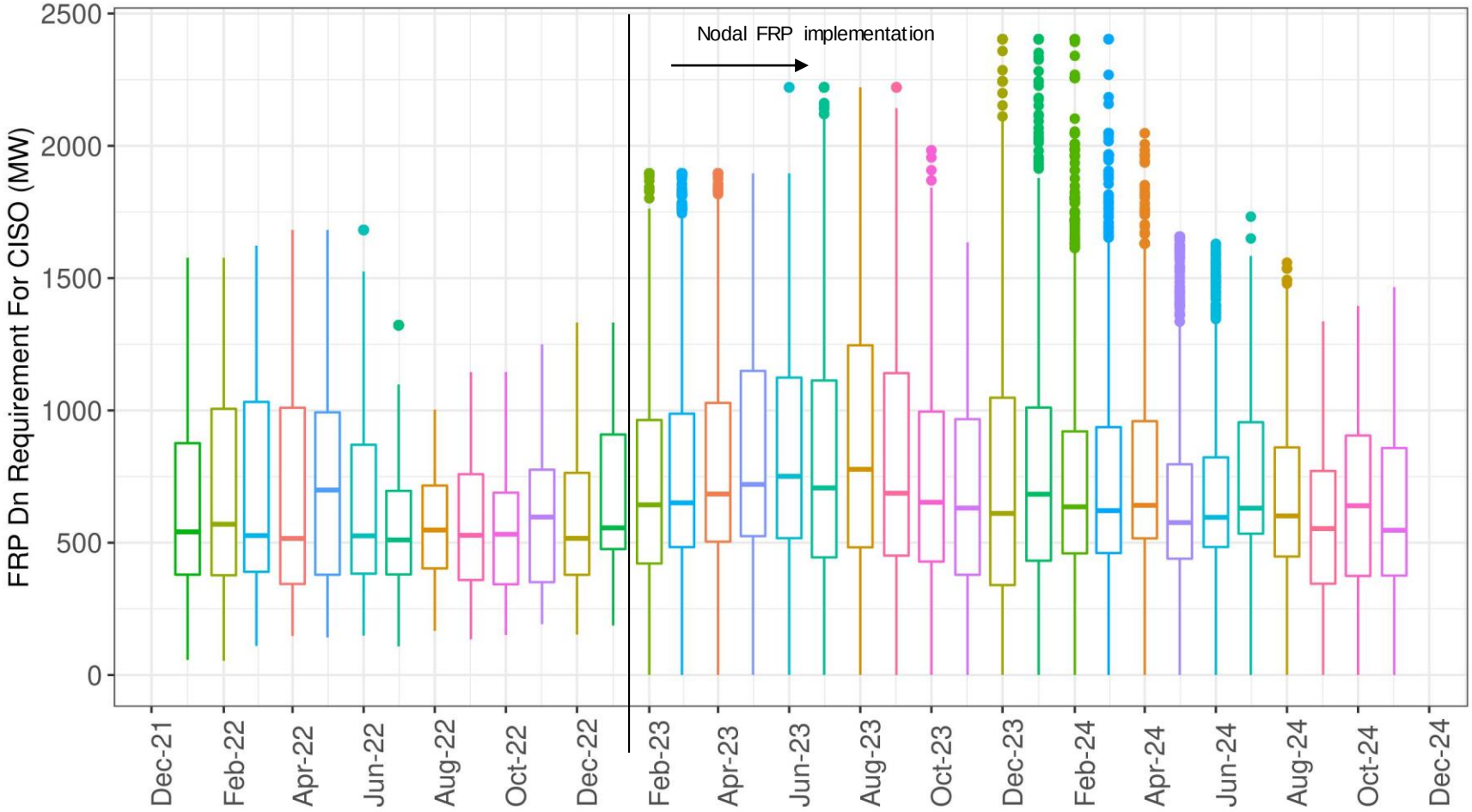


Flexible Ramping Product

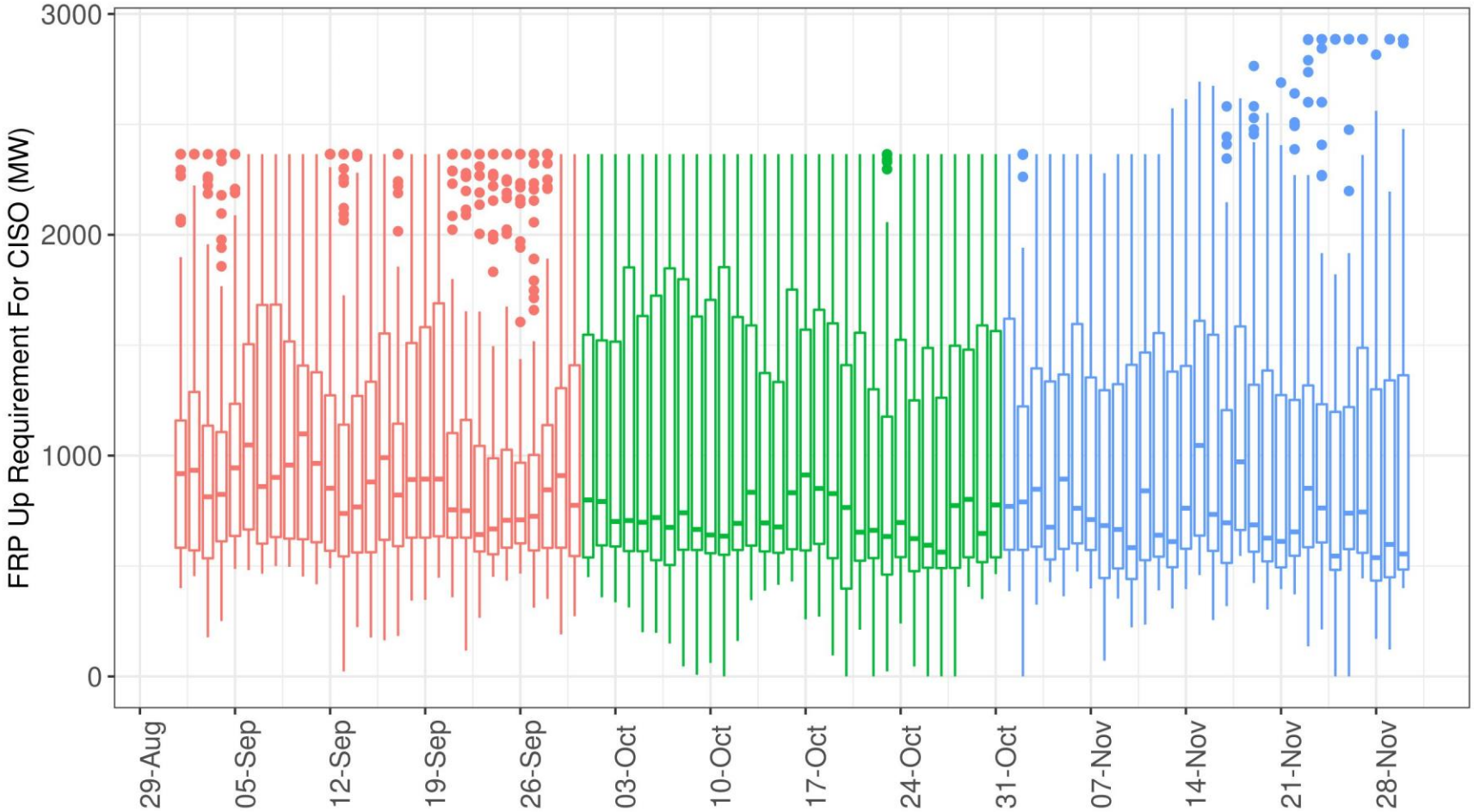
FRP Up Requirement for CAISO area remain within typical ranges



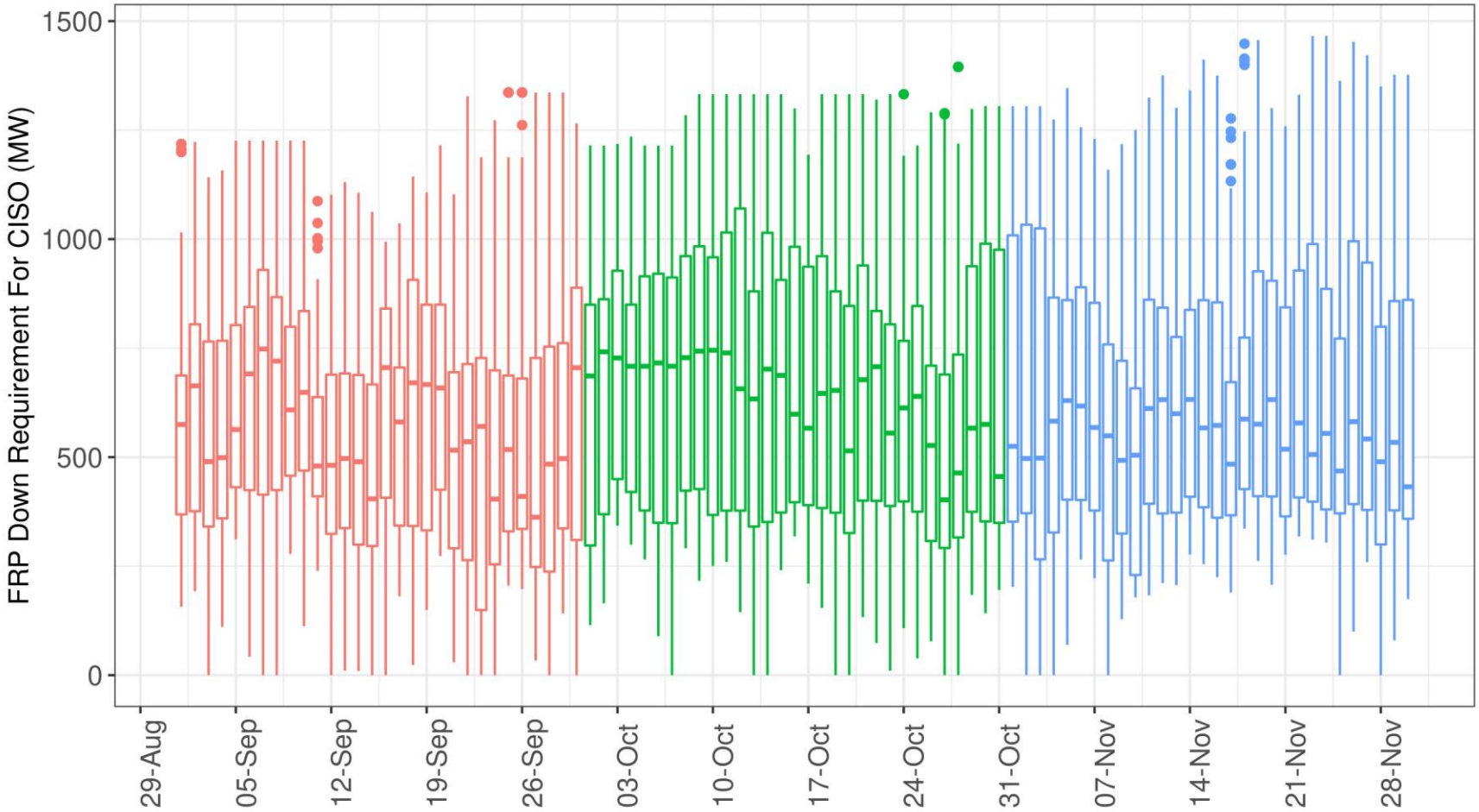
FRP Down Requirement for CAISO area remain within typical ranges



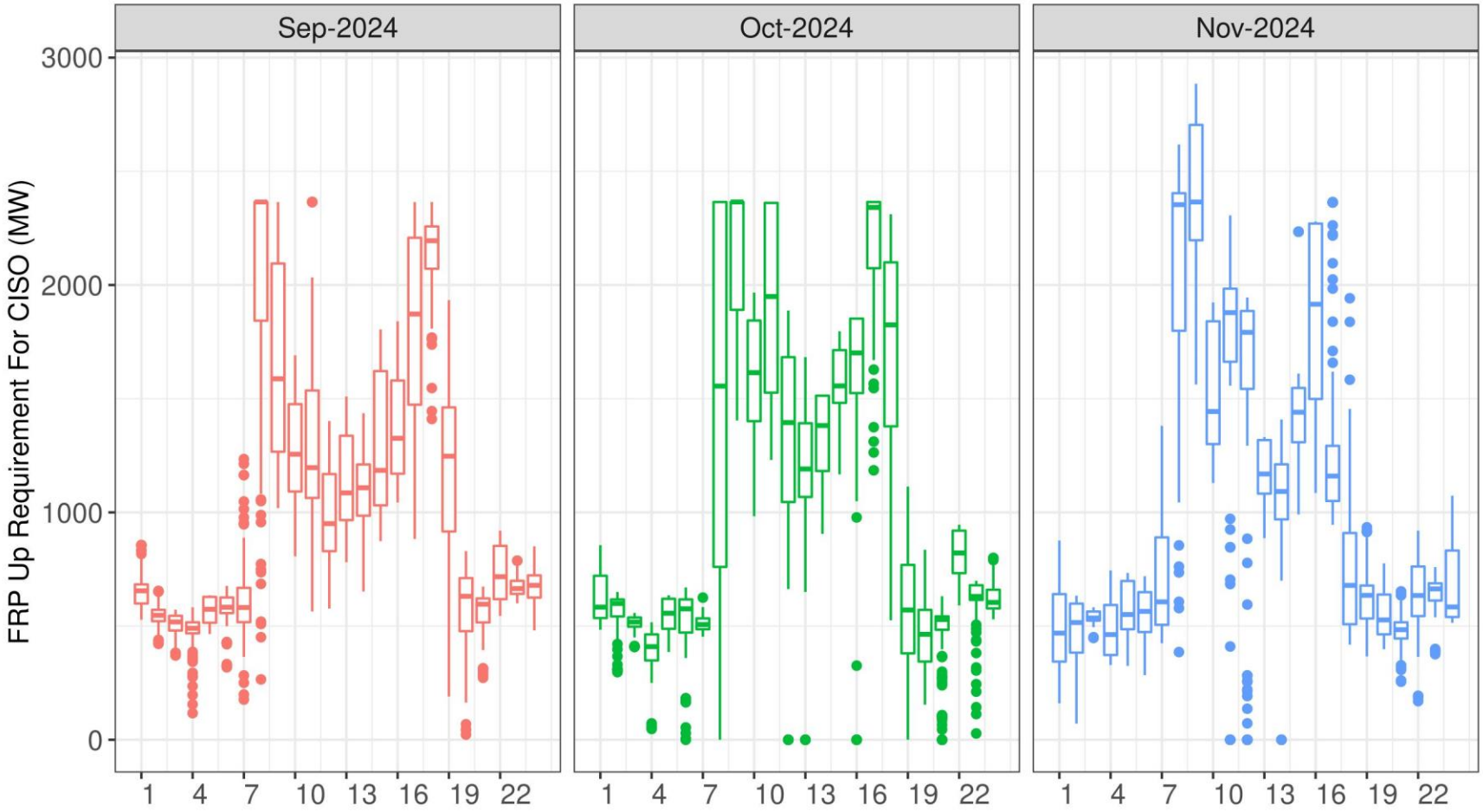
The daily distribution of FRP Up requirement in the last 3 months for CAISO area exhibits a steady trend



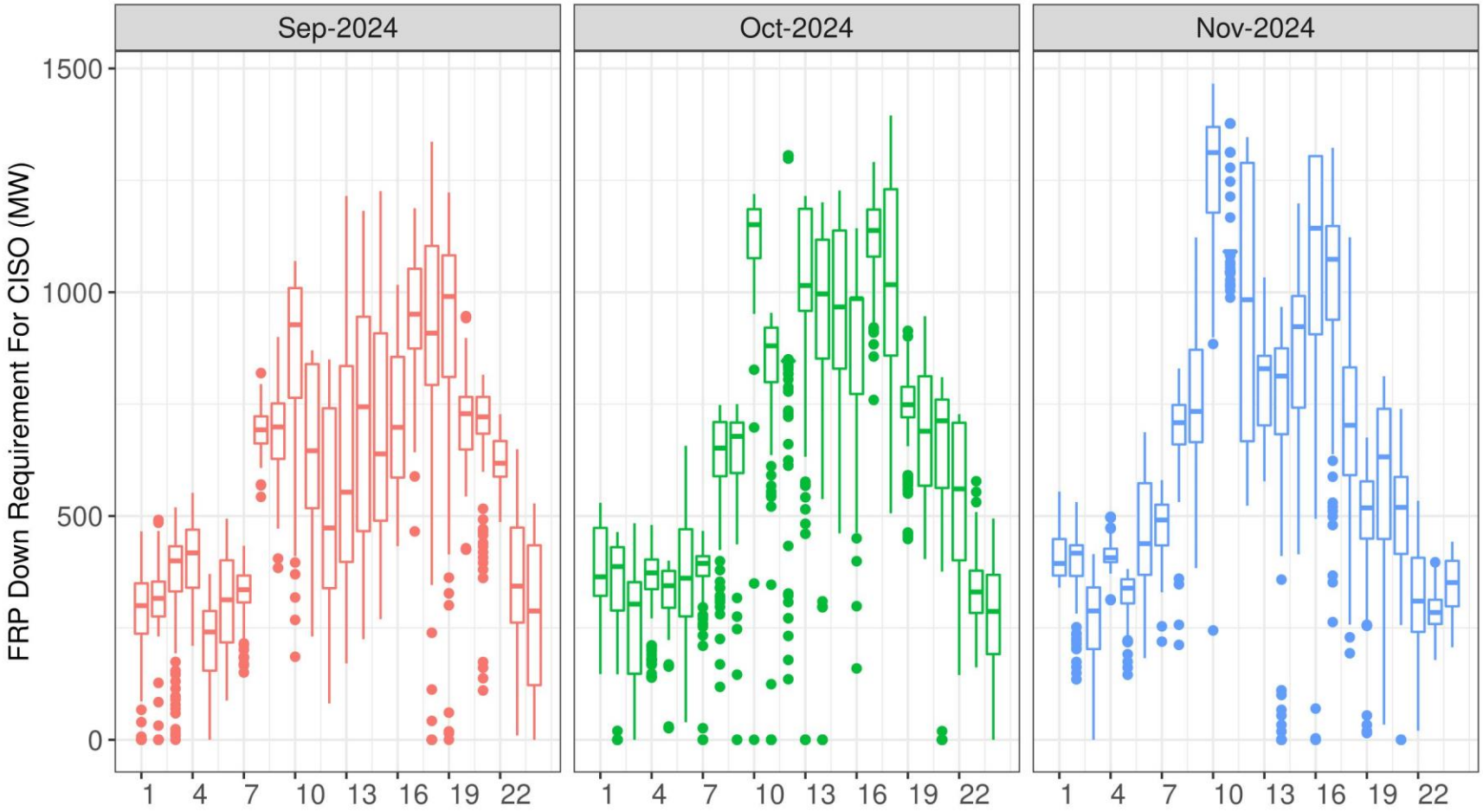
The daily distribution of FRP Down requirement in the last 3 months for CAISO area exhibits a steady trend



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



The hourly profile of downward FRP tends to follow a complementary pattern to the upward FRP, with higher values in midday hours



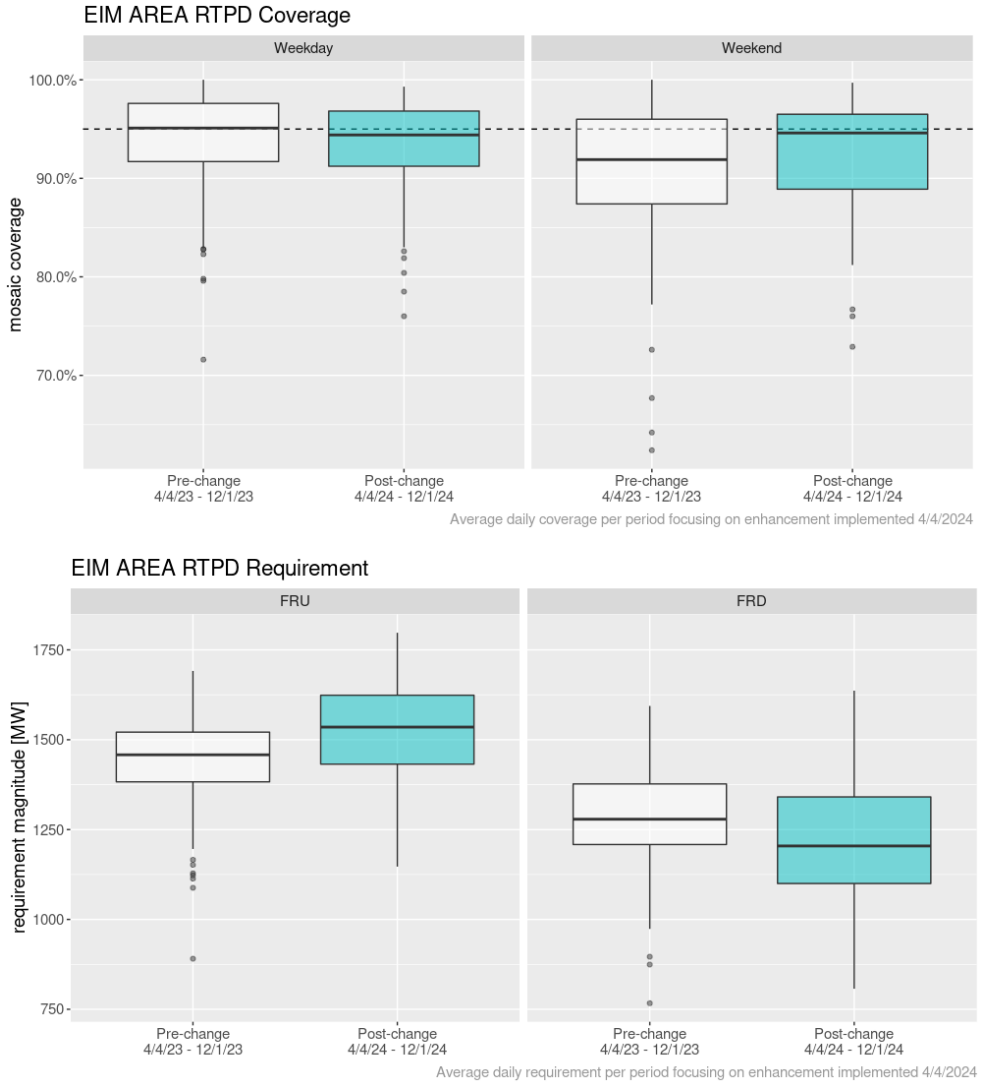
Two enhancements were implemented in 2024 to the calculation of FRP requirements

1. Day-type removal and VER capacity correction implemented 4/4/2024

2. Change from rolling to symmetric sampling implemented 8/14/2024

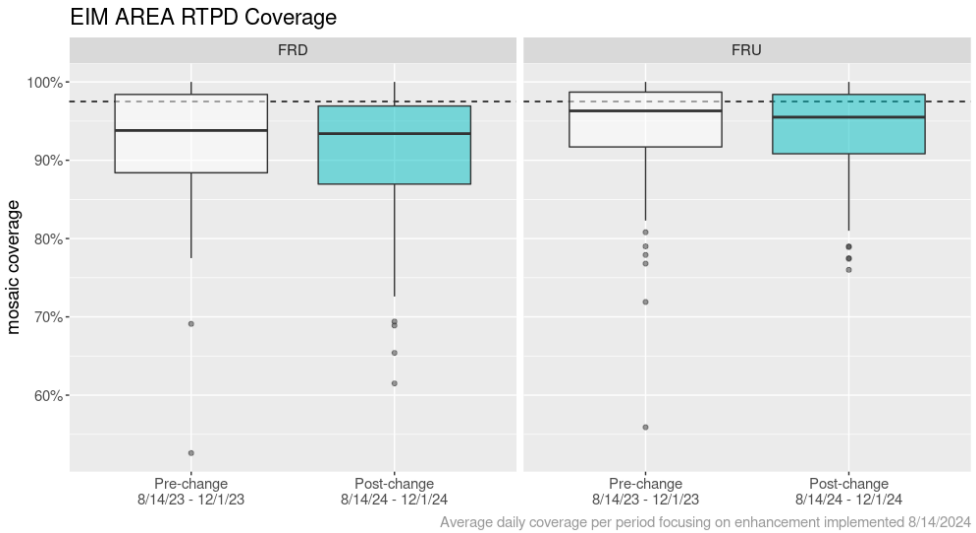
- New training:
  - A reference on FRP threshold calculations is posted in our Training Center under Market and Operations topic in Related Materials (linked here)
  - The presentation points to data available in OASIS that entities can use to review forecast performance contributing to FRP requirements and thresholds and walks through an example calculation of the static threshold

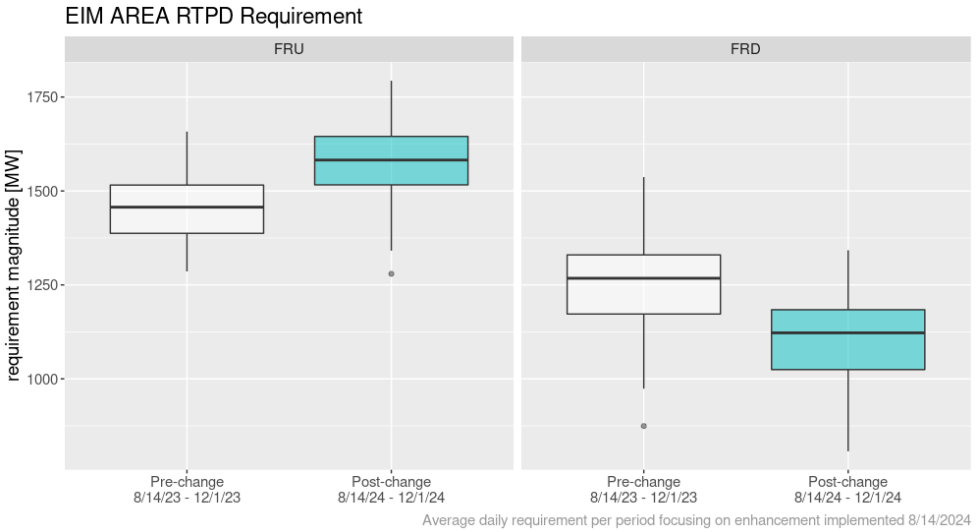
FRP performance focusing on 4/4 enhancement



- The 4/4 enhancement improved weekend coverage without detriment to weekday performance
- Compared to the 2023 sample period, FRU requirements were larger with FRD requirements comparable to slightly lower
- Requirements are generally expected to increase with VER capacity growth

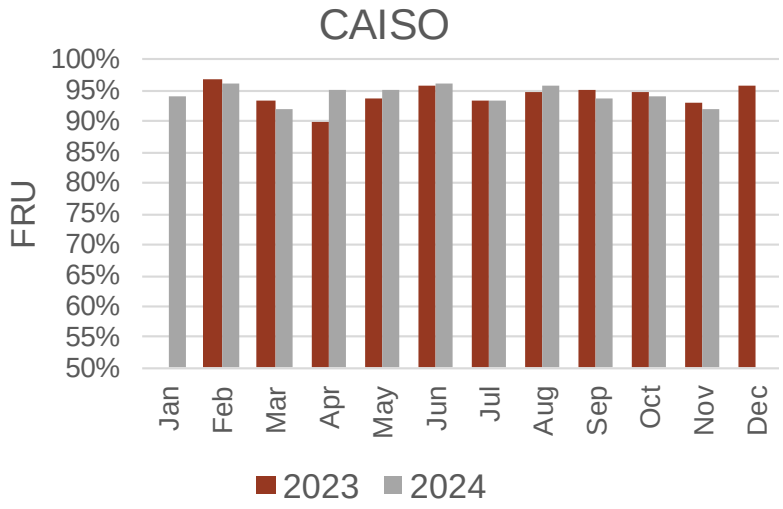
FRP performance focusing on 8/14 enhancement

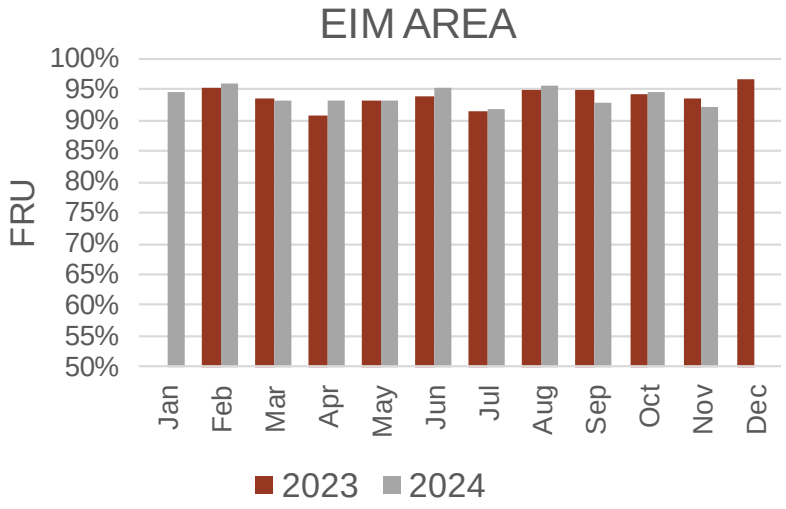


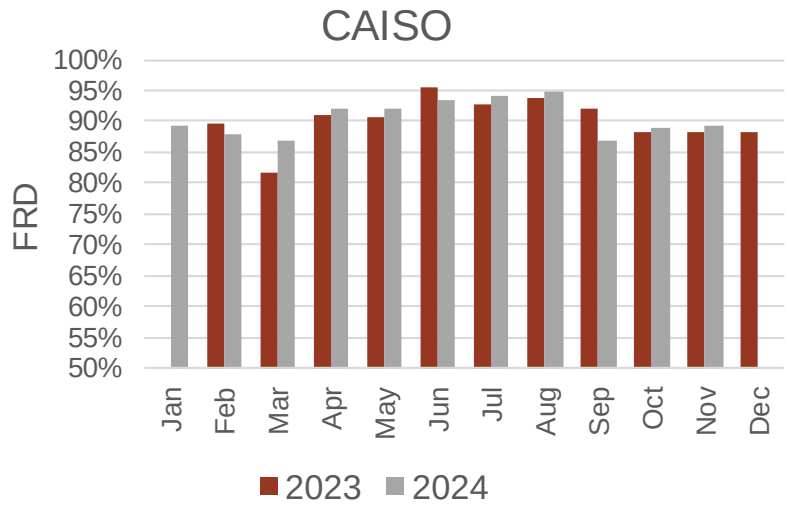


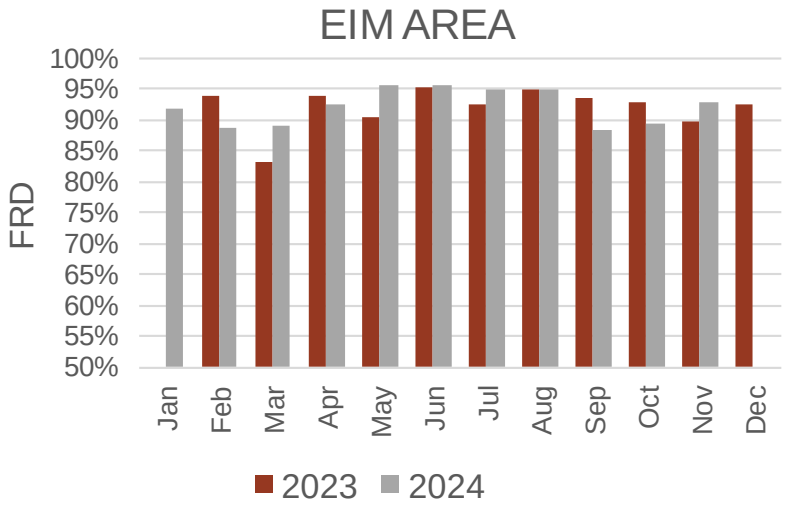
- In aggregate, coverage has remained comparable. Upward requirements have increased and downward requirements have decreased compared to the same period one year prior
- Symmetric sampling should assist with performance in transition seasons but may be masked by other factors like different weather patterns and VER growth between sample periods

FRP Coverage

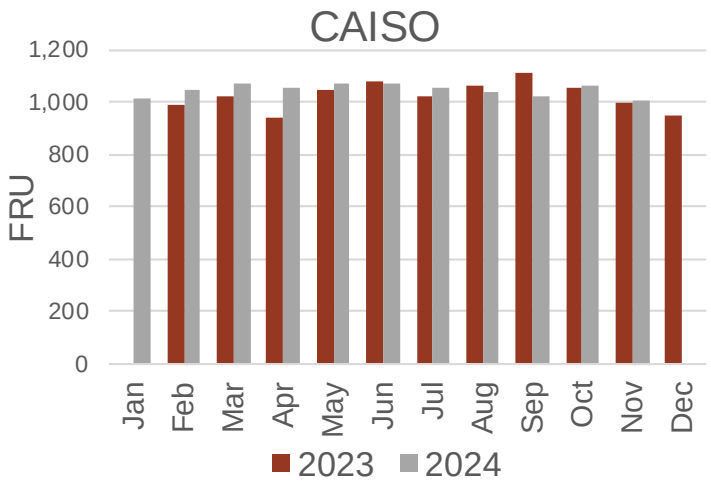


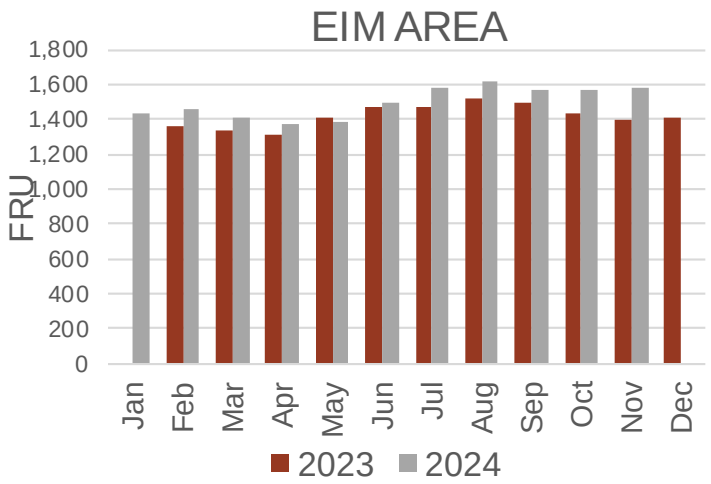


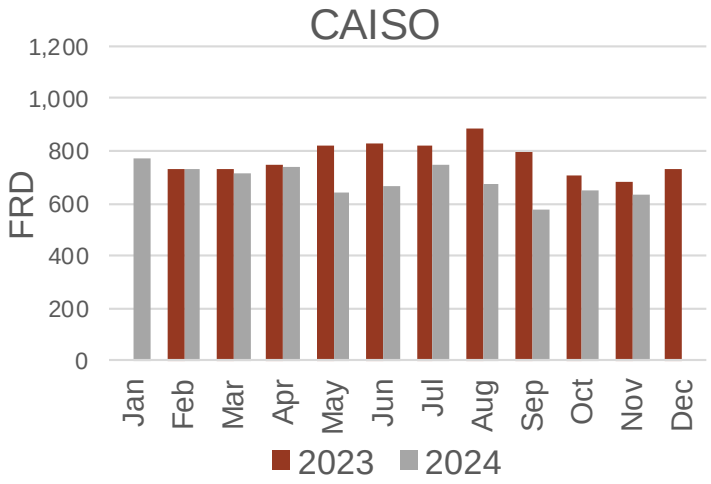


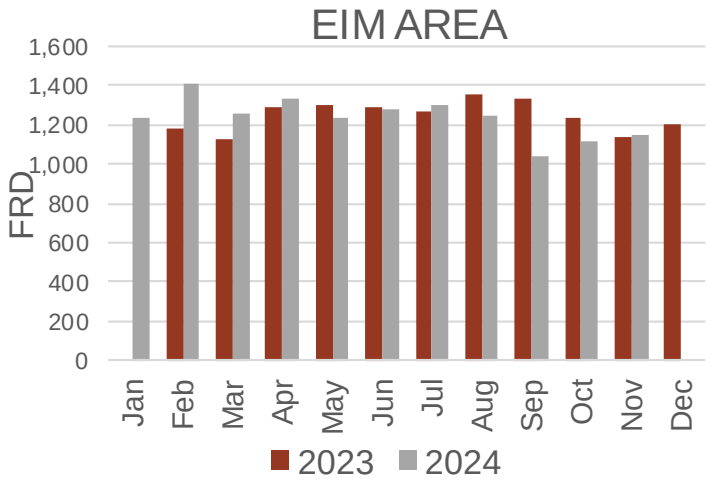


FRP Requirement

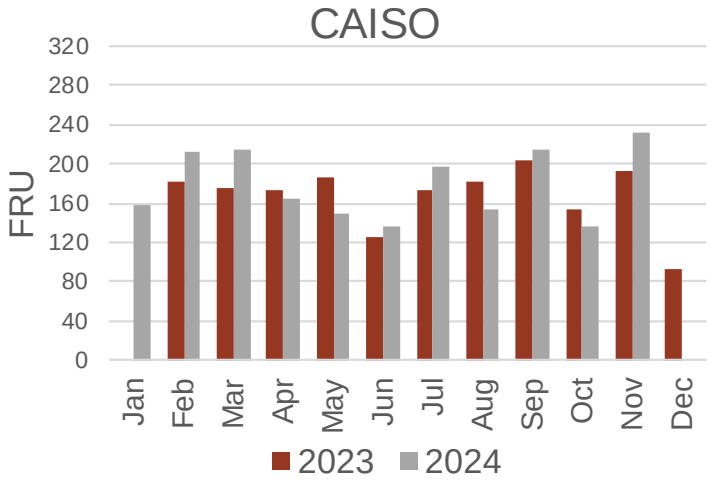


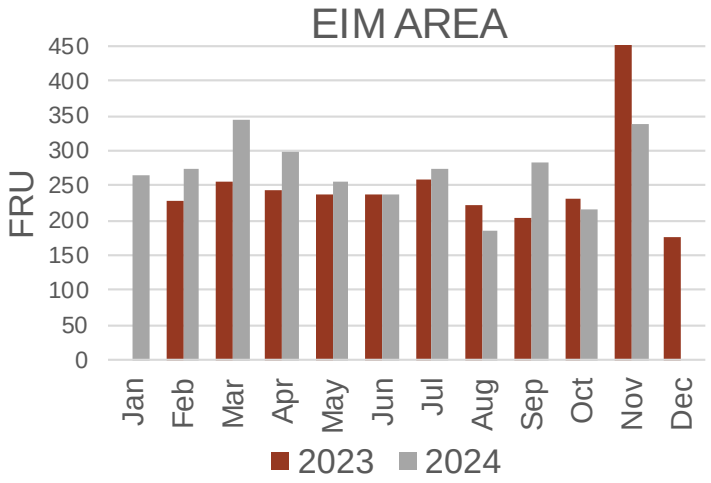


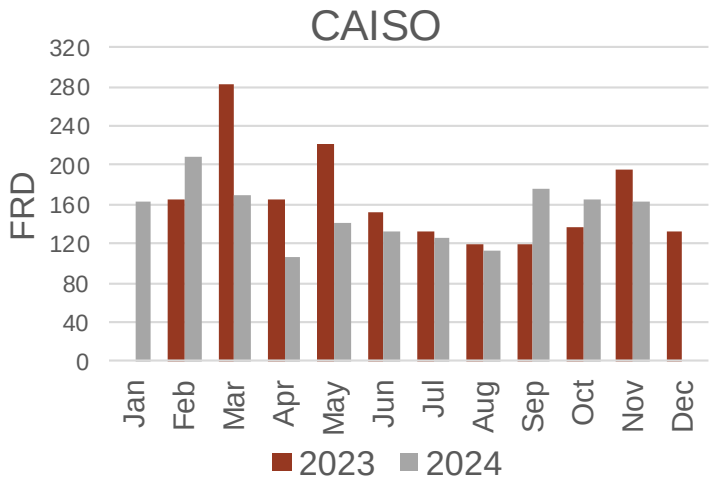


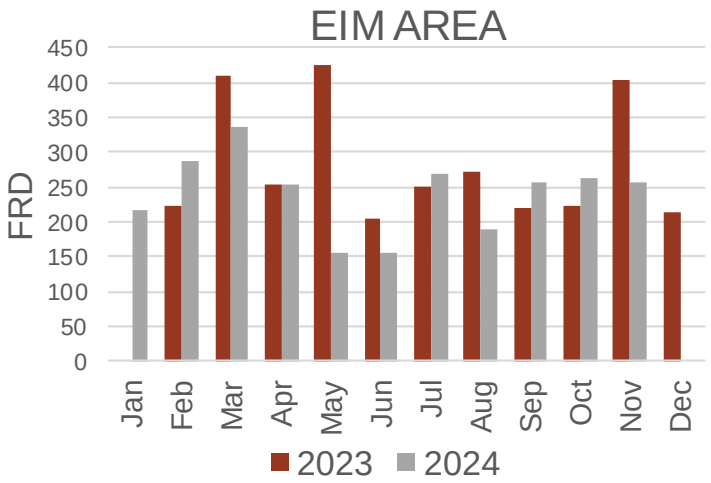


FRP Exceedance



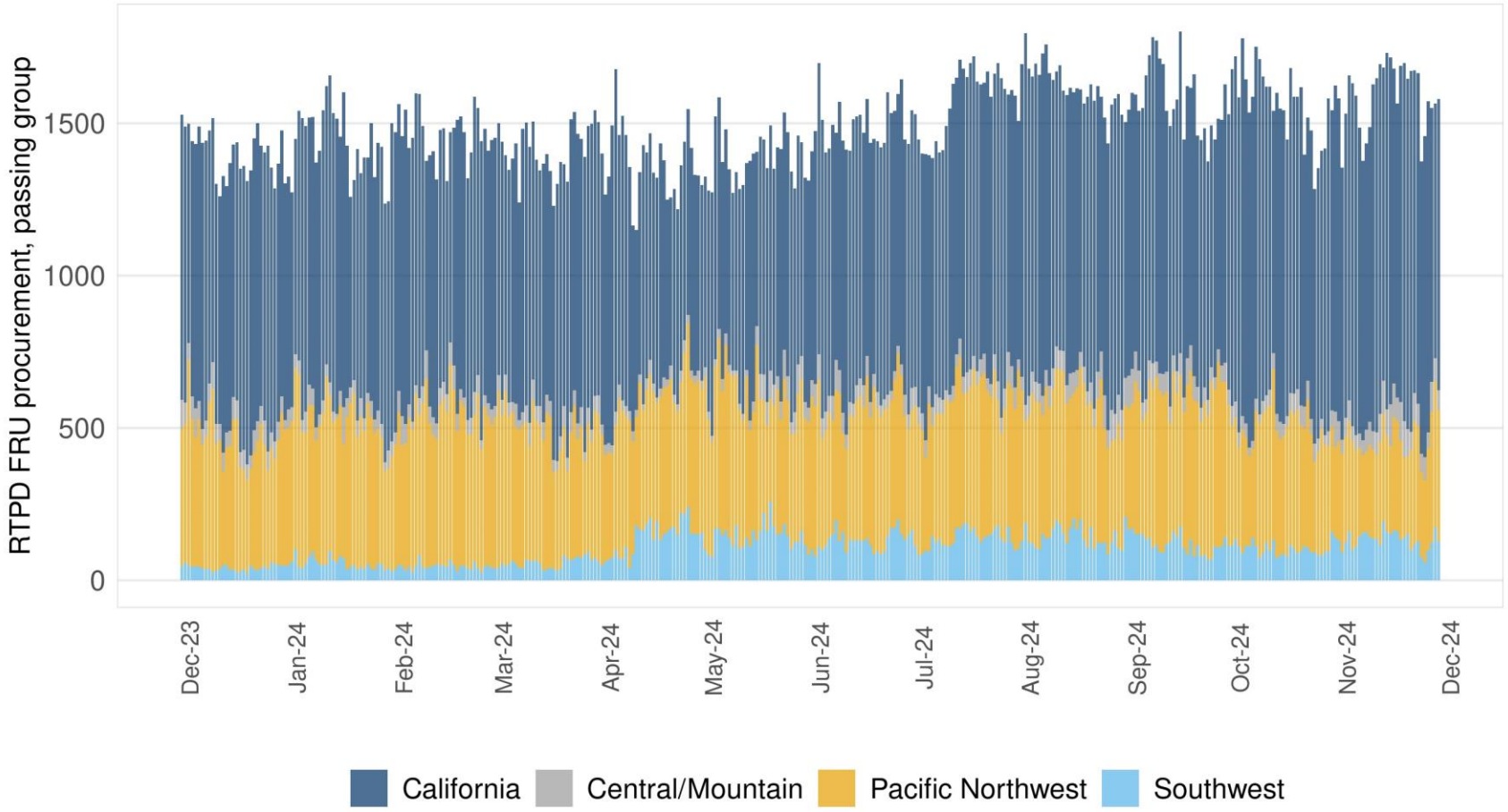




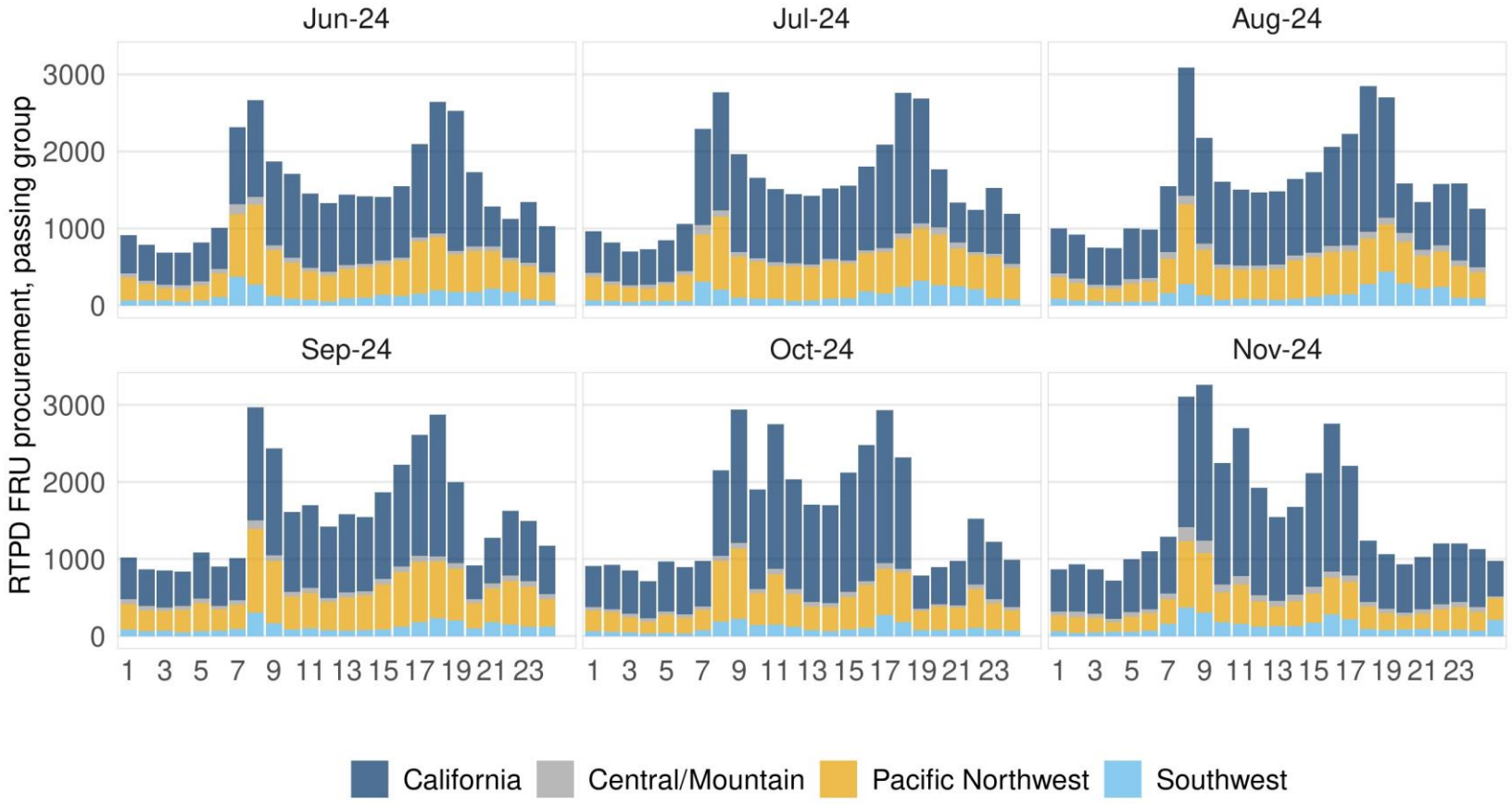


The ISO is working to update the tracking metrics as discussed in the November 29th, MSC.

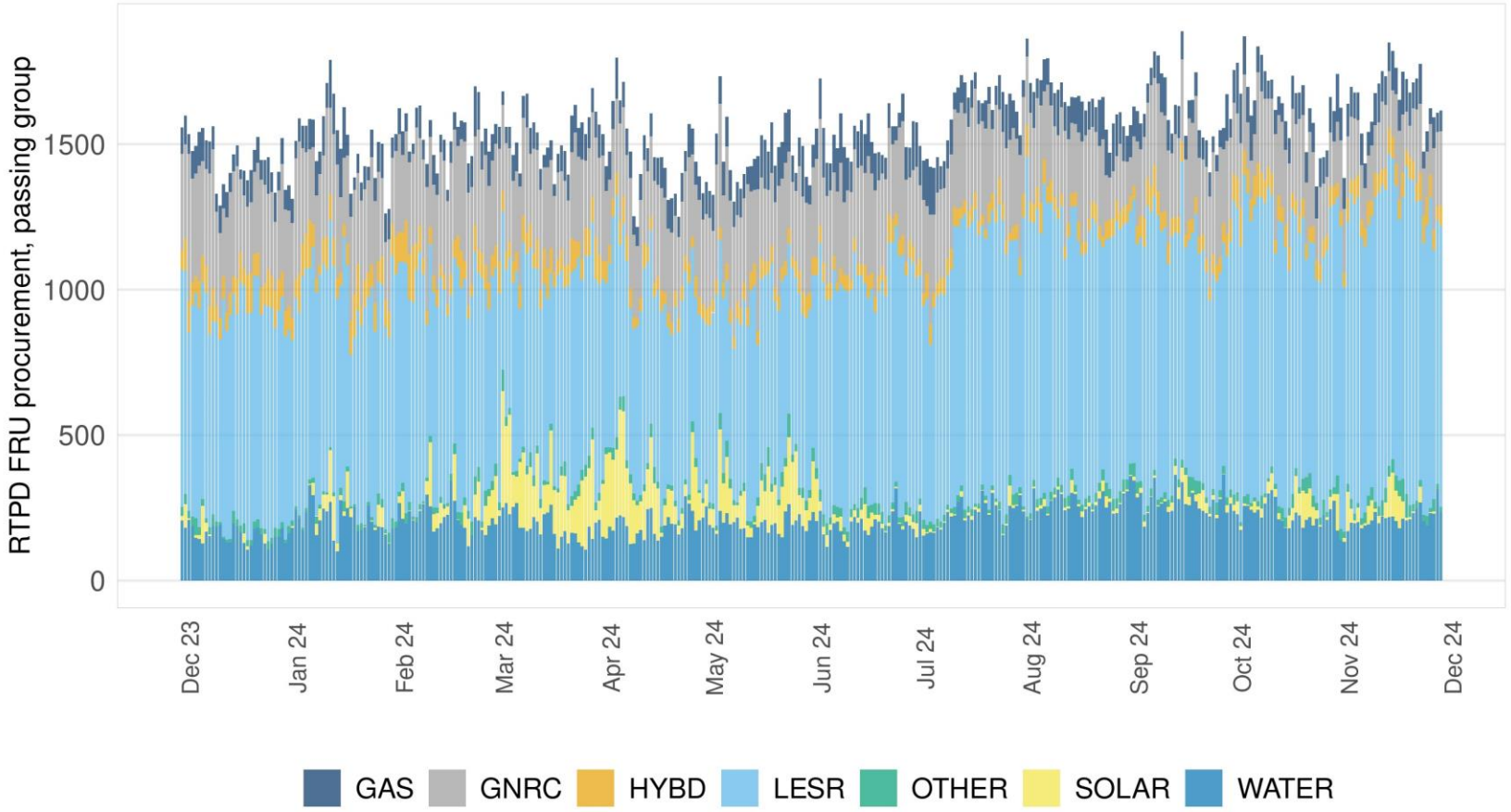
Upward FRP is largely procured from areas in the Pacific Northwest and California



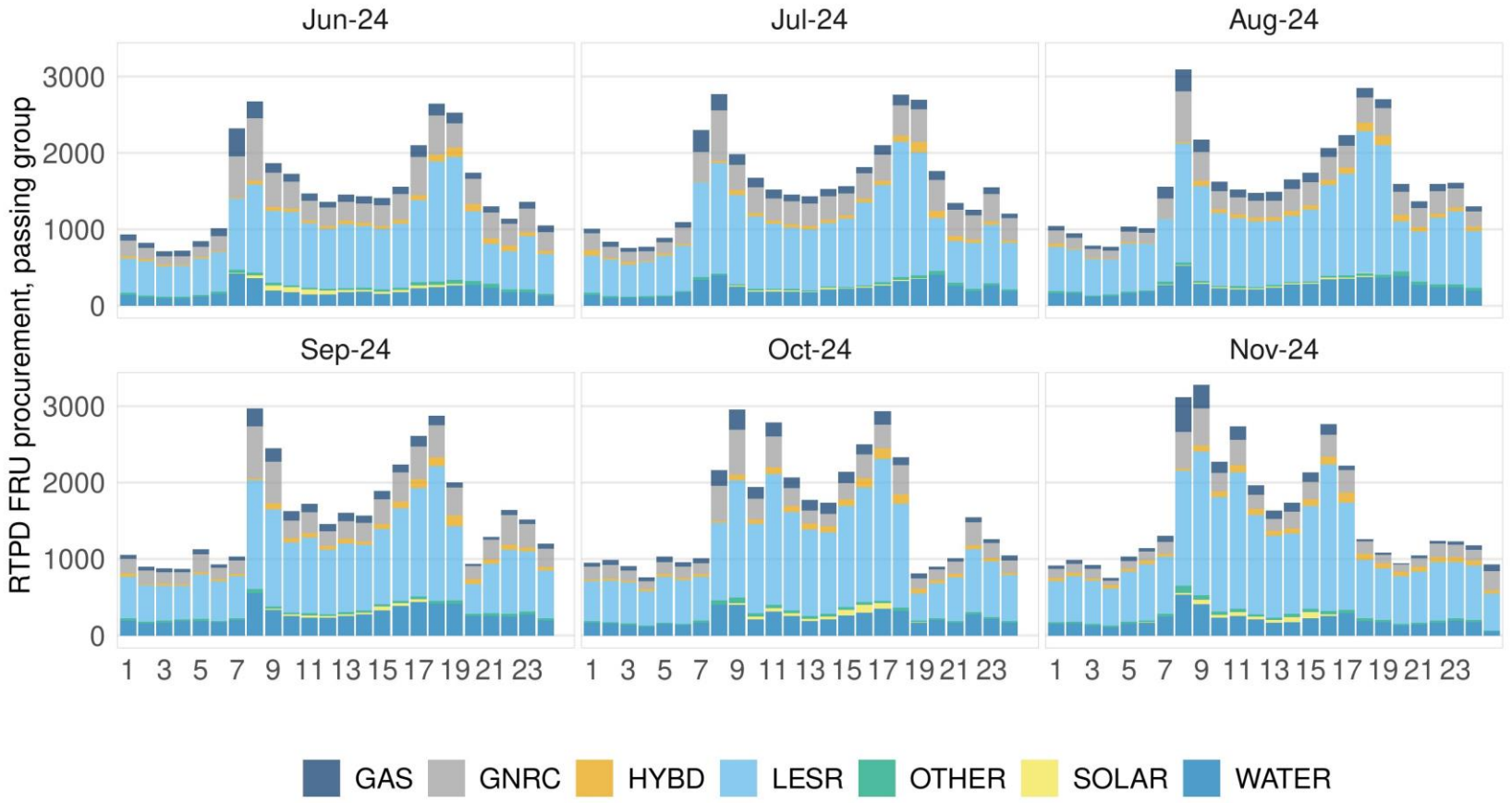
Upward FRP procurement from CAISO area is largely occurring in the peak hours



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



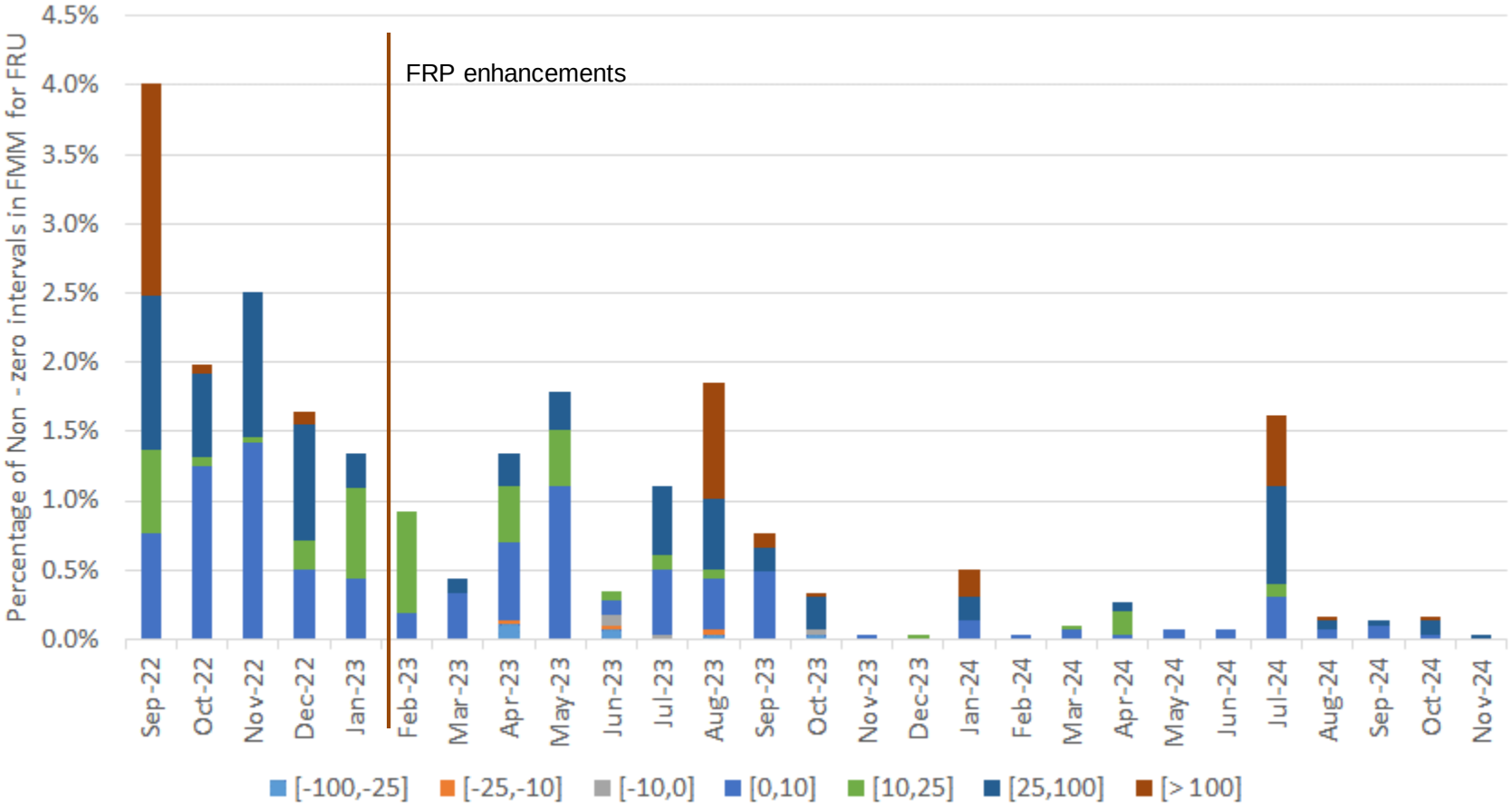
Storage resources tend to support upward FRP procurement for evening ramping hours



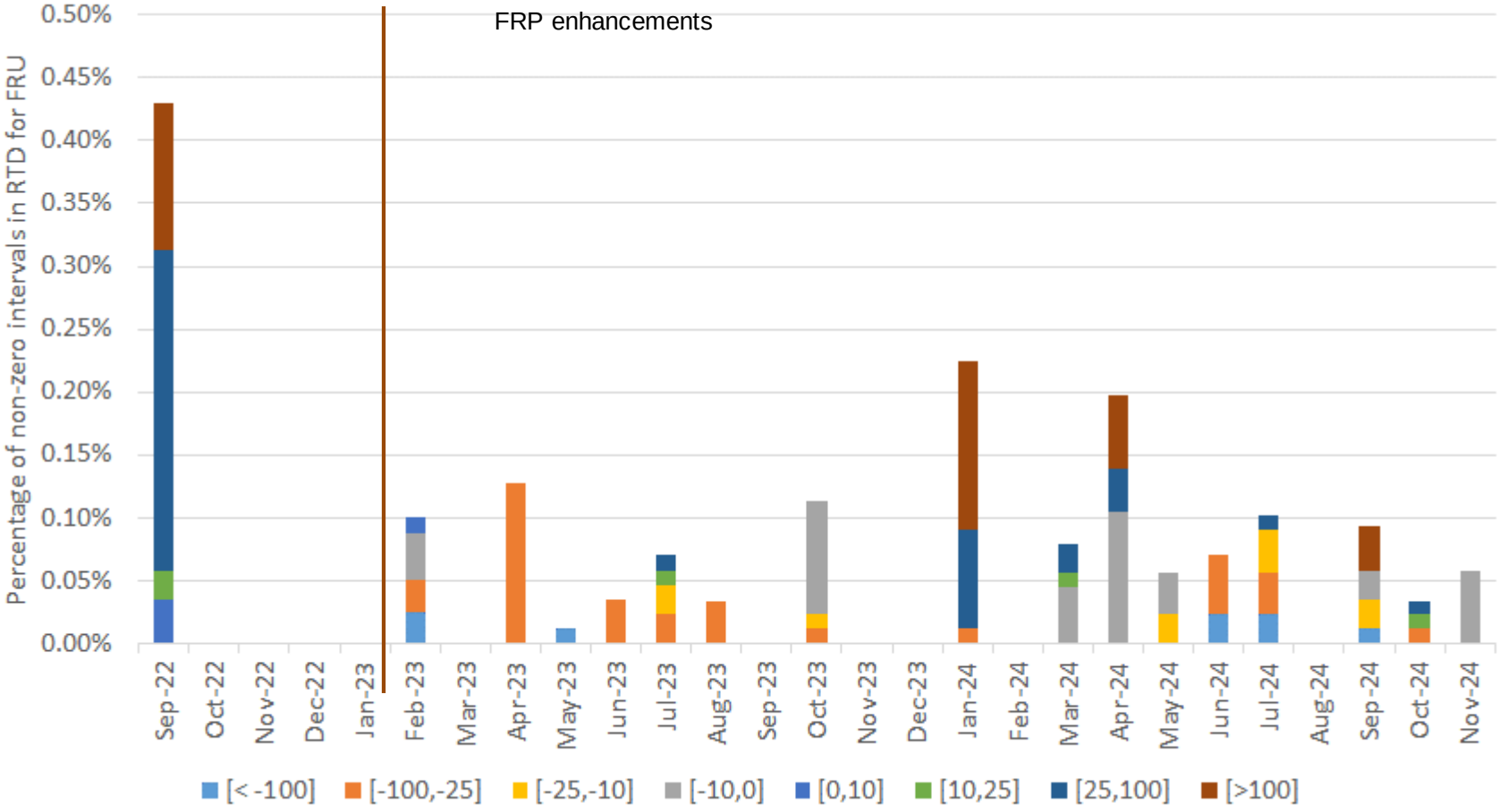
The FRP awarded to storage resources may not be deliverable due insufficient state of charge

- Current formulation of state of charge does not consider the impact to the state of charge when delivering FRP
- Since a large share of FRP is procured by storage resources, it may not provide material ramp to the real-time market
- Through the analysis of FRP performance, the ISO has identified the need to enhance the logic to account for state of charge when storage resources procure FRP
- The ISO will assess this issue and an enhancement in the upcoming initiative for storage resources

Frequency of intervals with non-zero FMM prices for upward FMM continues to be low after nodal implementation



Frequency of intervals with non-zero RTD prices for upward FRP continues to be low after nodal implementation



Energy Storage Performance

Energy storage enhancements Track 2 was activated on November 1, 2023

- The original state of charge equation

$$SOC_{i,t} = SOC_{i,t-1} - \left(EN_{i,t}^{(+)} + \eta_i \, EN_{i,t}^{(-)}\right) \frac{\Delta T}{T_{60}}$$

$$\underline{SOC}_{i,t} \leq SOC_{i,t} \leq \overline{SOC}_{i,t}$$

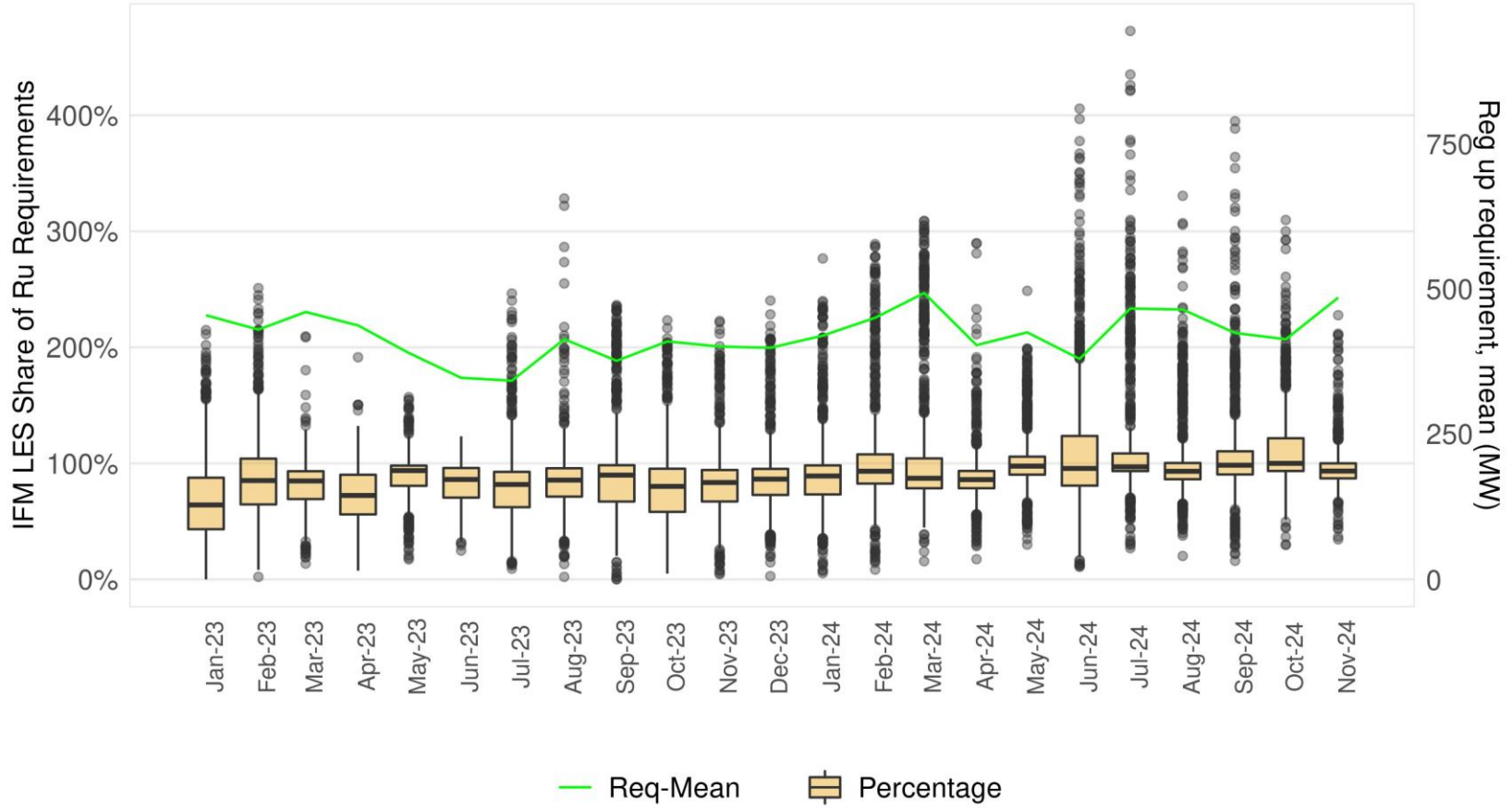
(SOC: original SOC with energy impact only)

- A new set of constraints is introduced

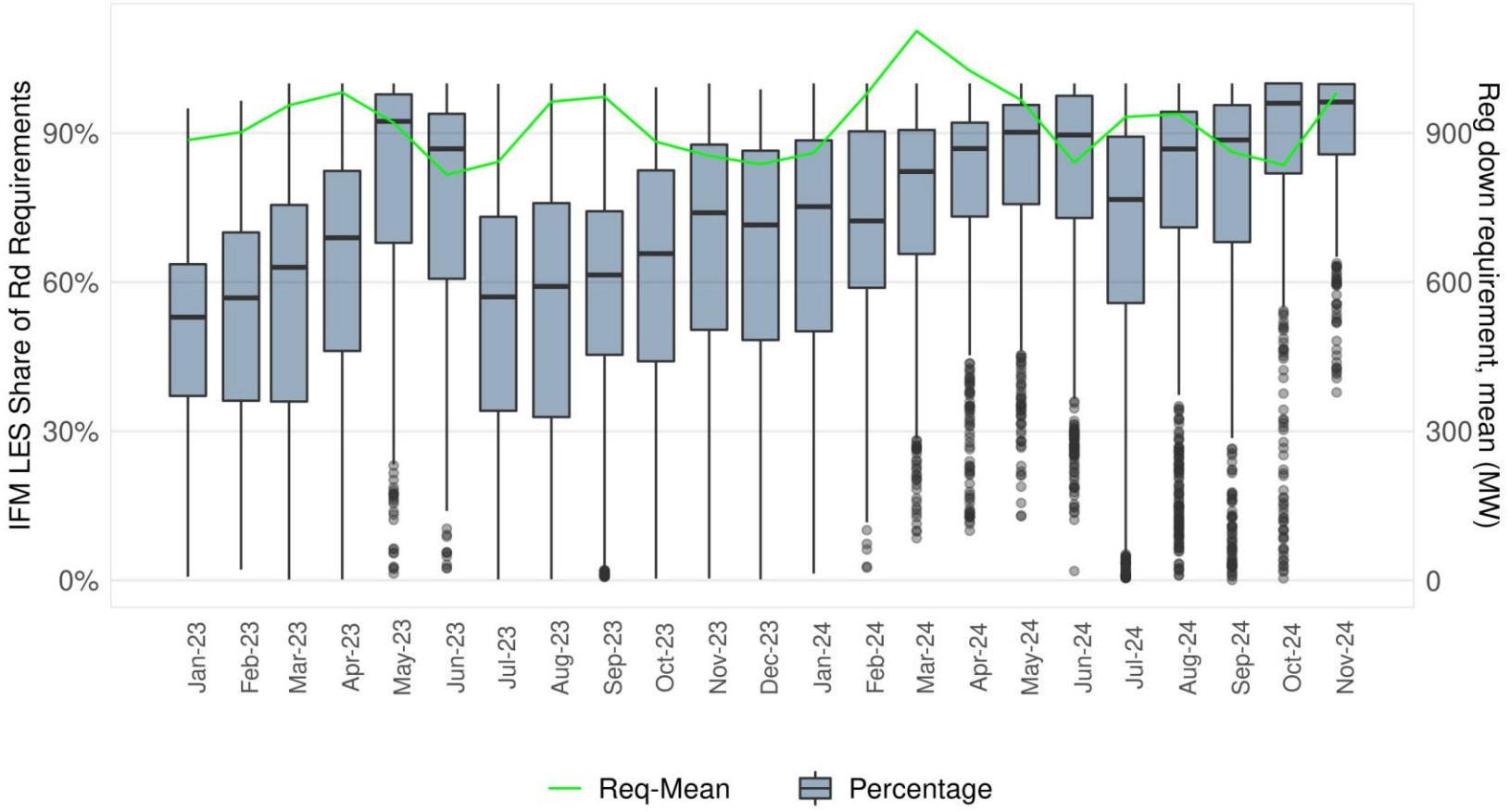
$$SOC_{i,t}^{AT} = SOC_{i,t-1}^{AT} - \left(EN_{i,t}^{(+)} + \eta_i \, EN_{i,t}^{(-)} + \boldsymbol{ATRU_t} \, RU_{i,t} - \boldsymbol{ATRD_t} \eta_i RD_{i,t}\right) \frac{\Delta T}{T_{60}}$$

(SOC^{AT} : SOC with attenuation factors)

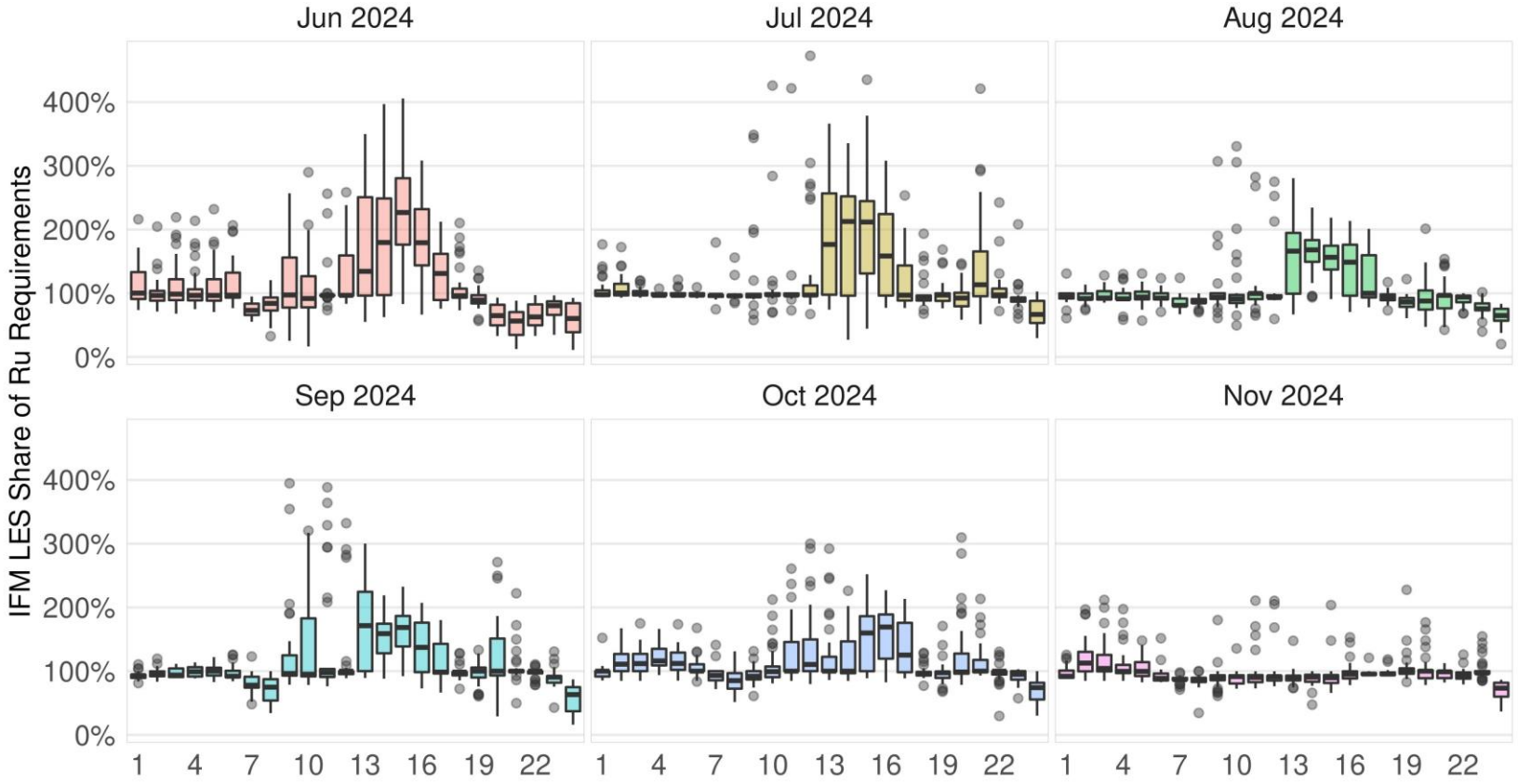
In recent months there is no material change in the share of regulation requirement supported by storage resources



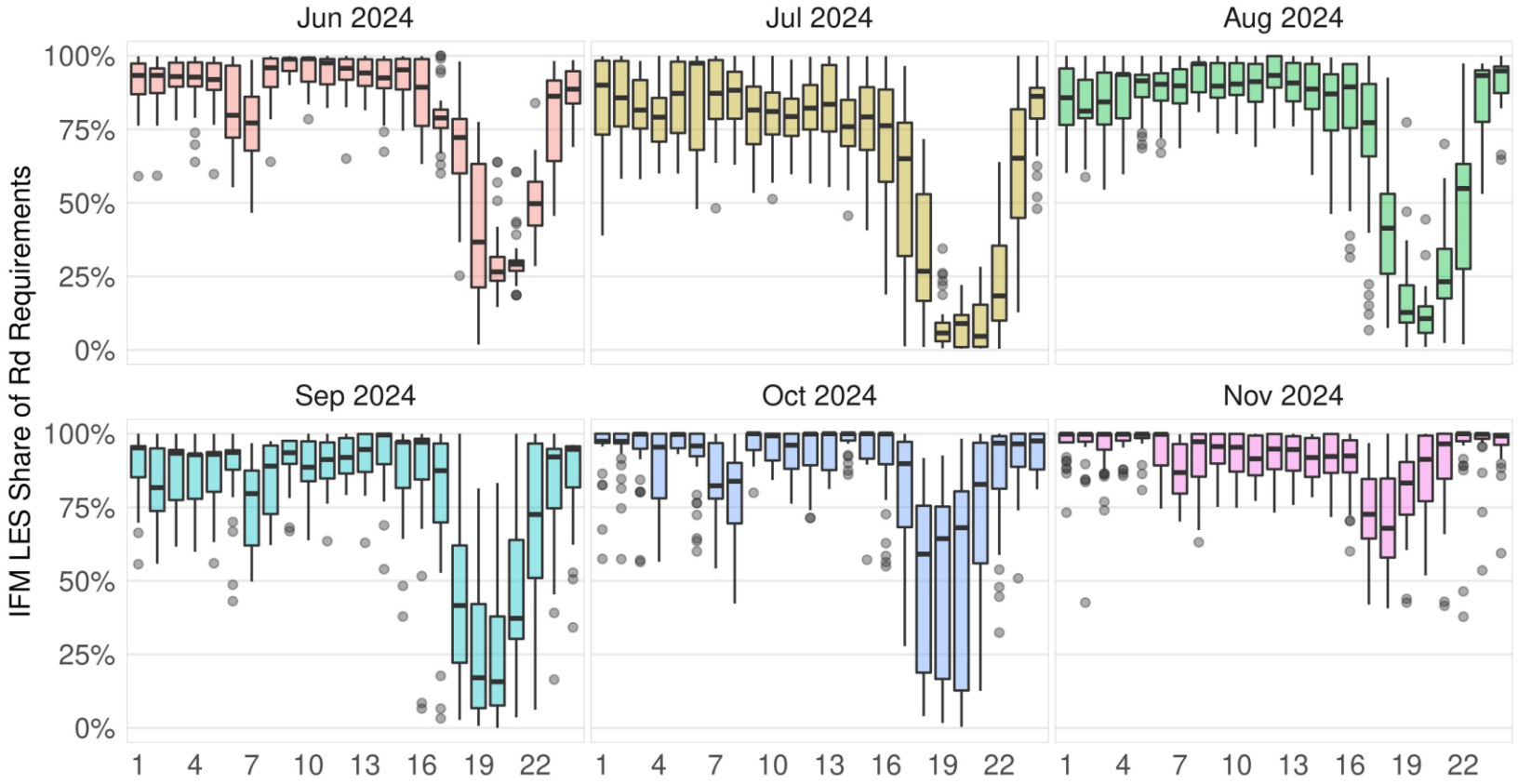
Share of regulation down requirements by storage resources has steadily increased in recent months



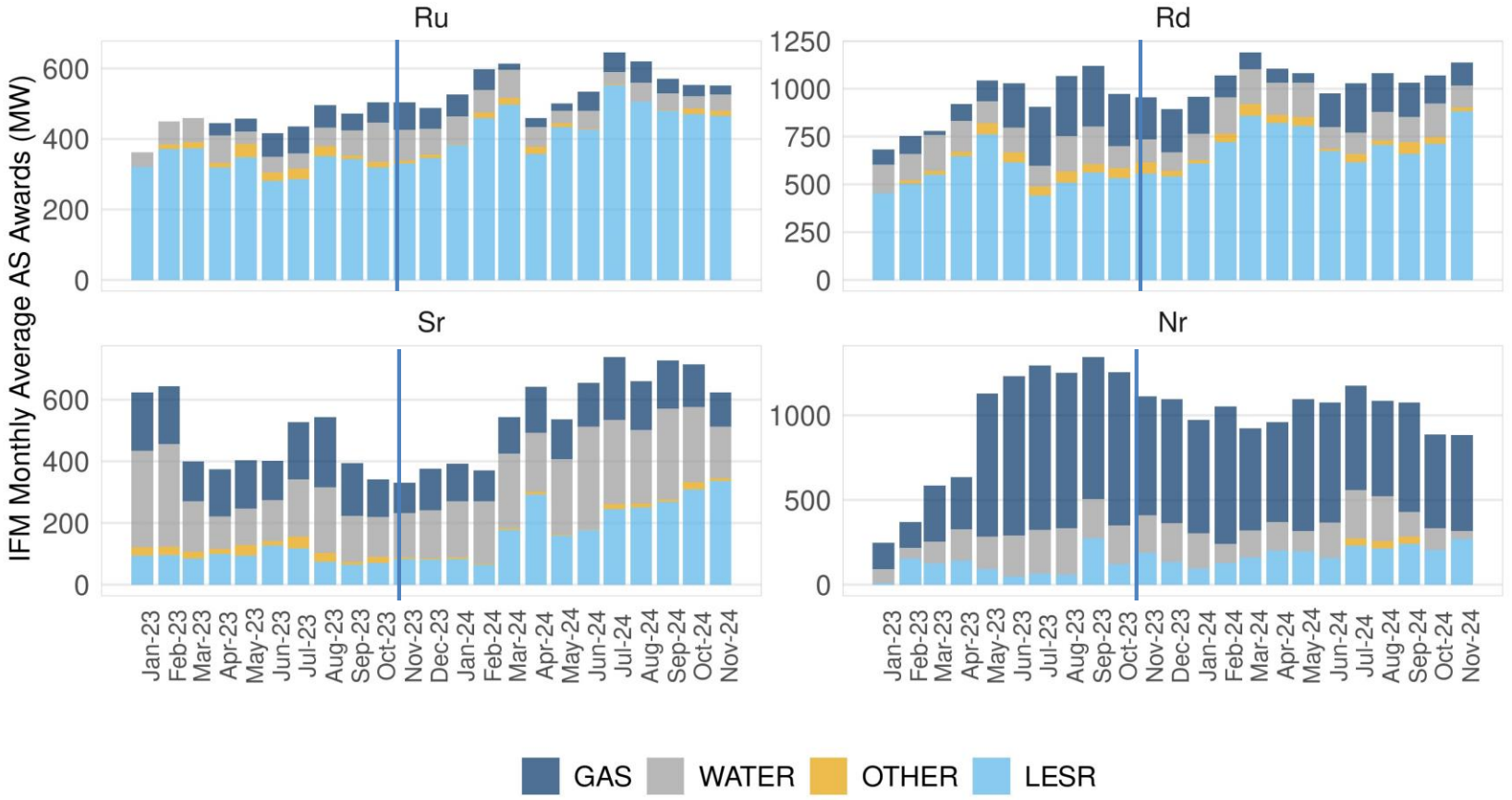
No material change in the hourly profile of the LESR percentage share of the Ru requirement after implementation of enhancements



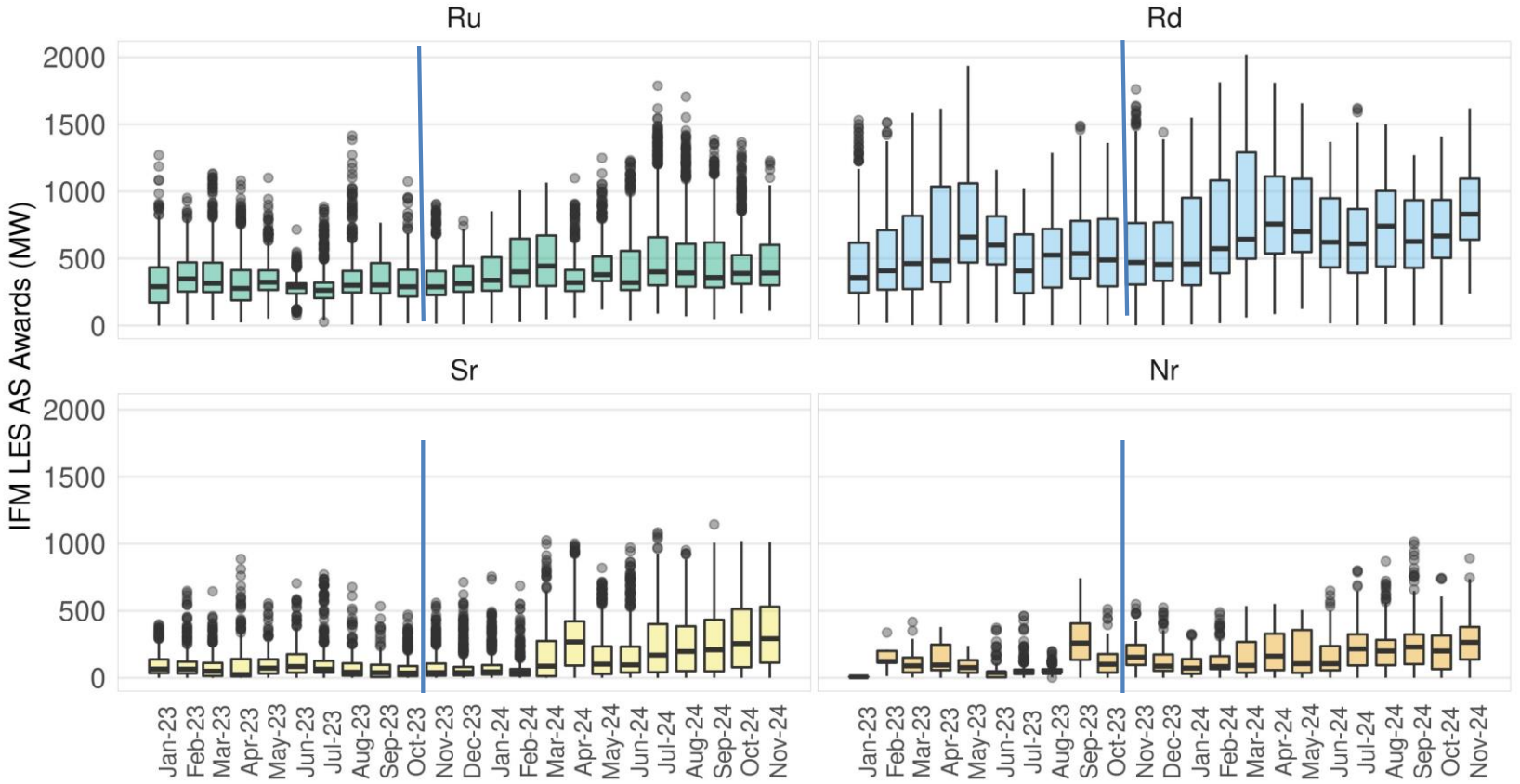
No material change in the hourly profile of the LESR percentage share of the Rd requirement



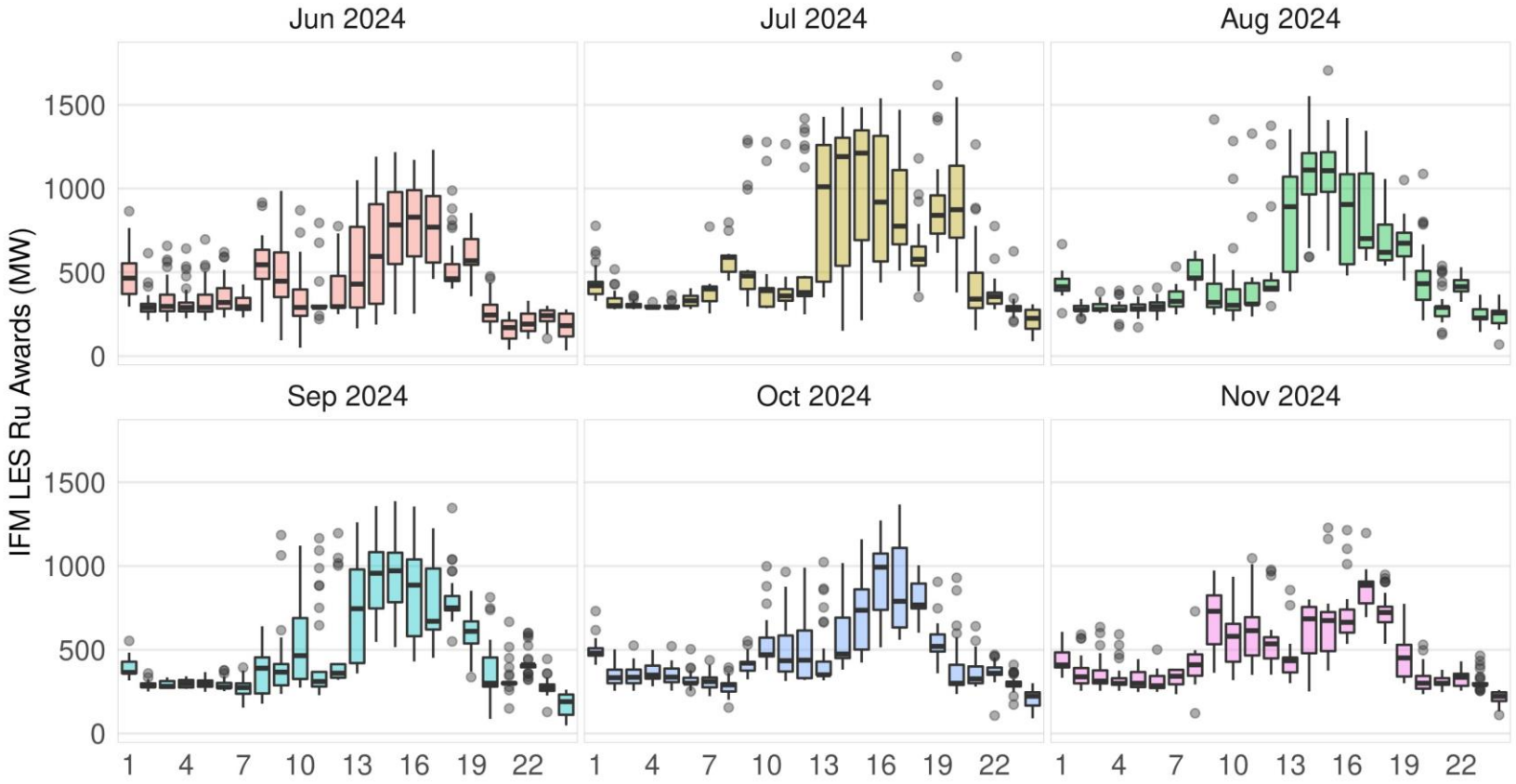
Monthly average IFM AS awards for storage shows no significant change in pattern



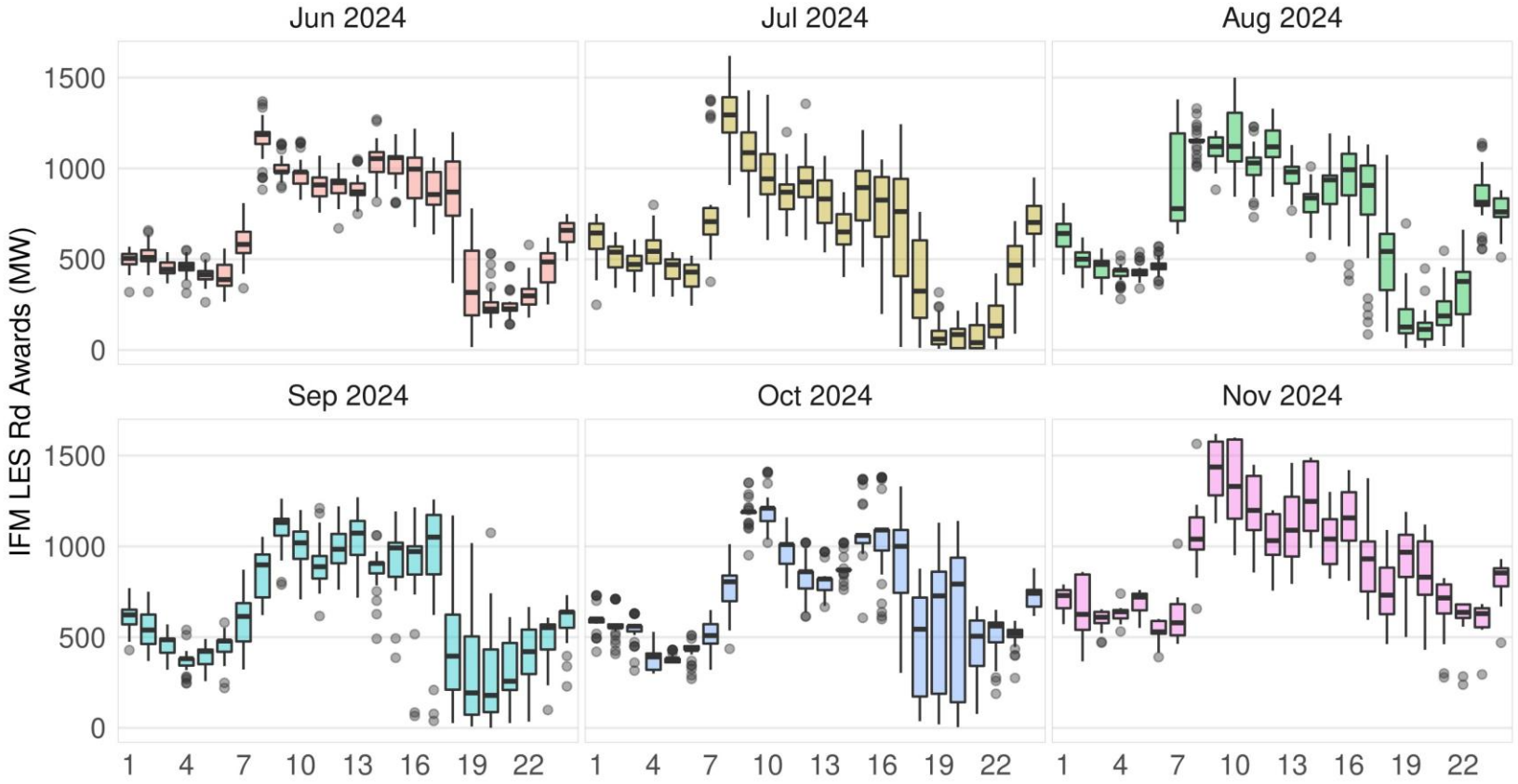
Monthly IFM AS market awards show no significant change in pattern



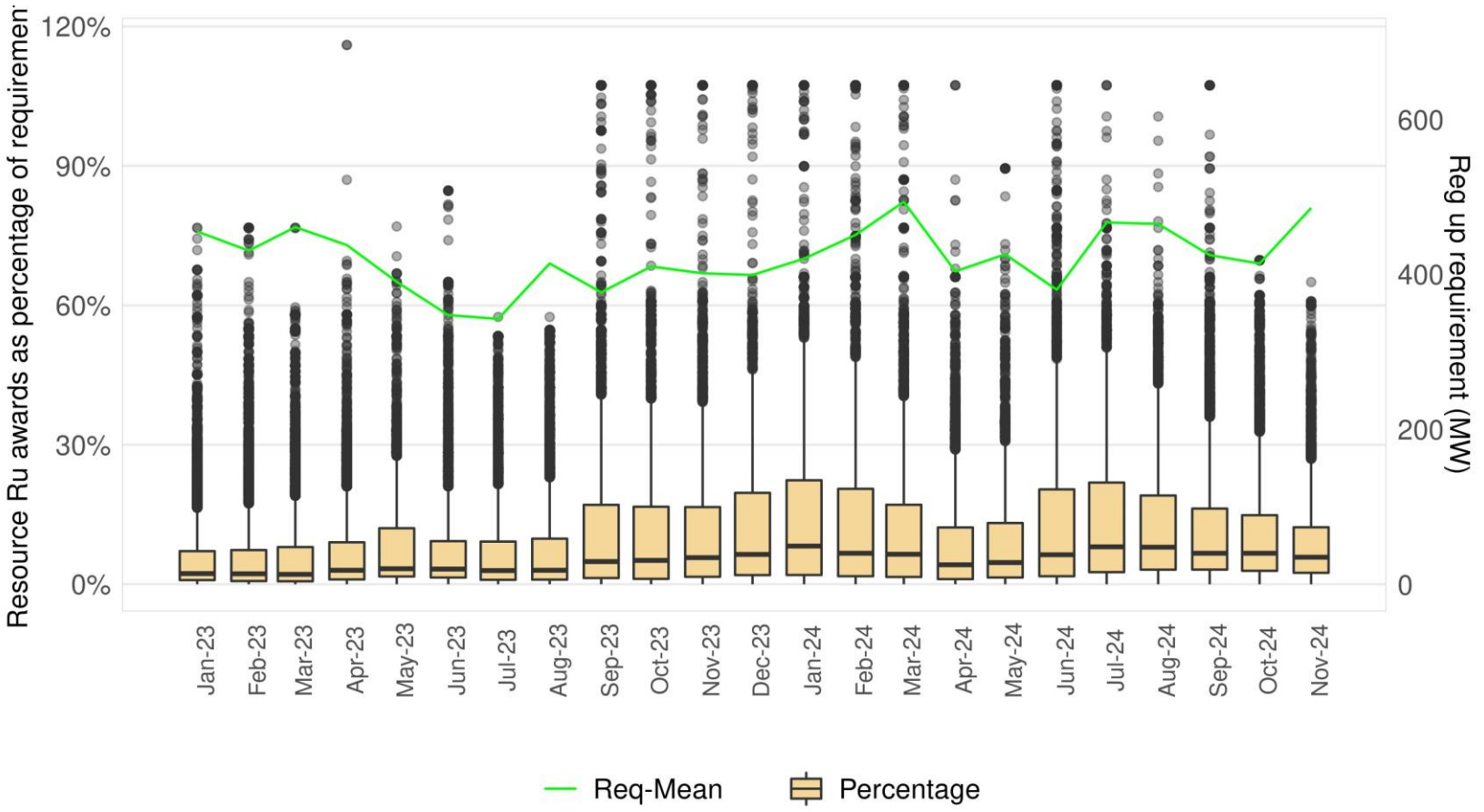
Regulation up awards in the day-ahead market have not seen a material change in trend



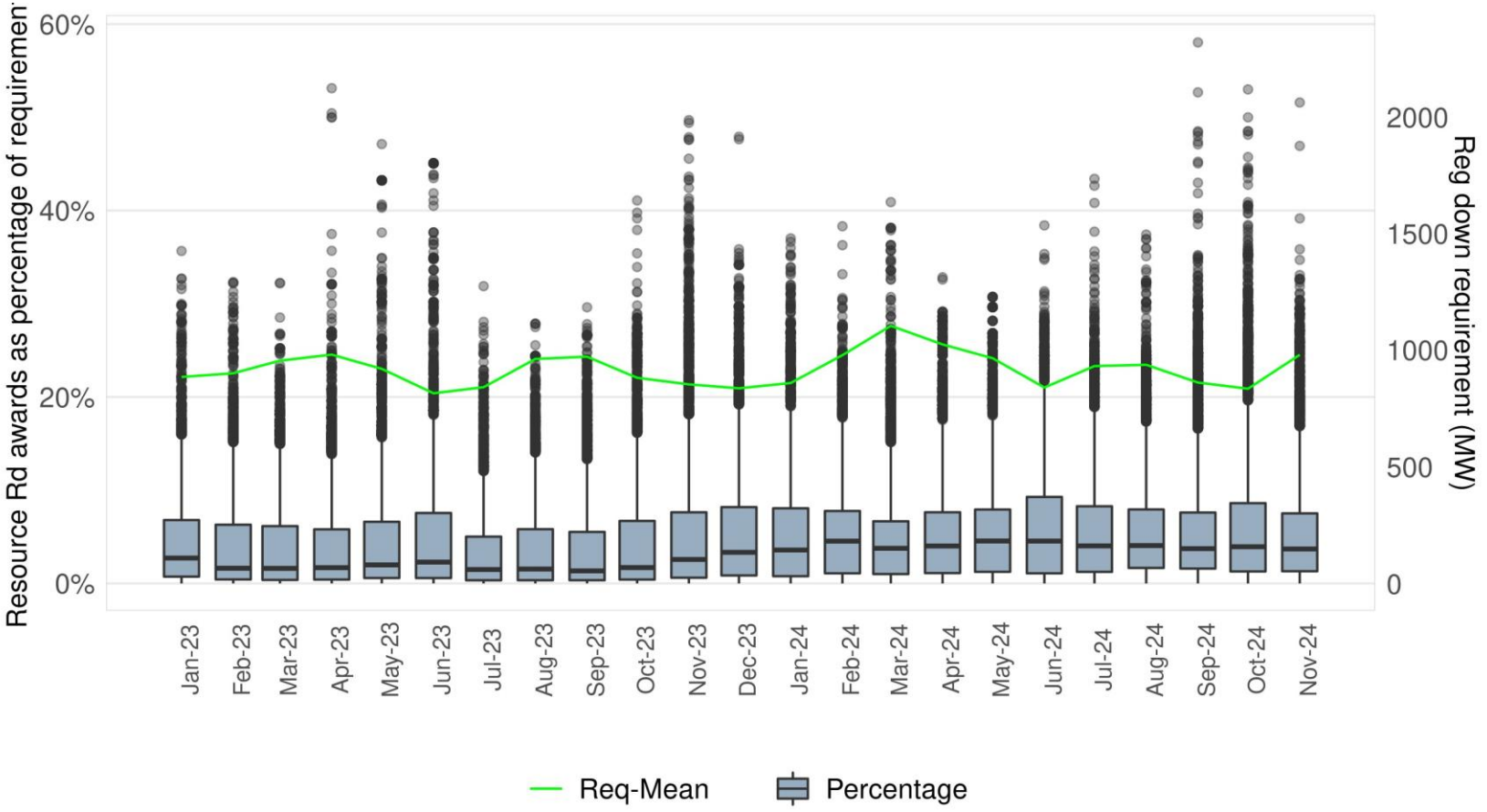
Regulation down awards in the day-ahead market have not seen a material change in trend



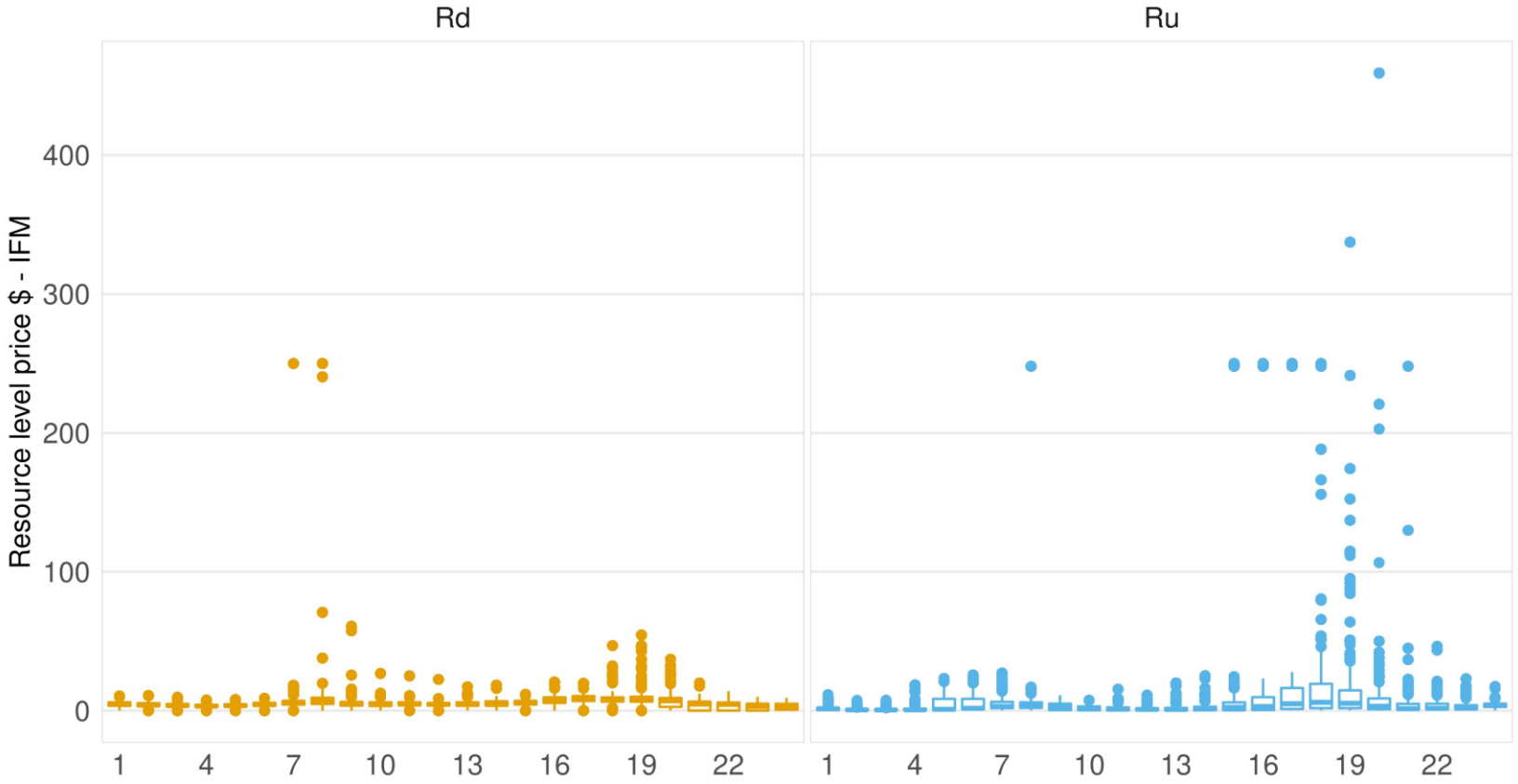
The relative size of Regulation award on individual resources tends to be within typical ranges



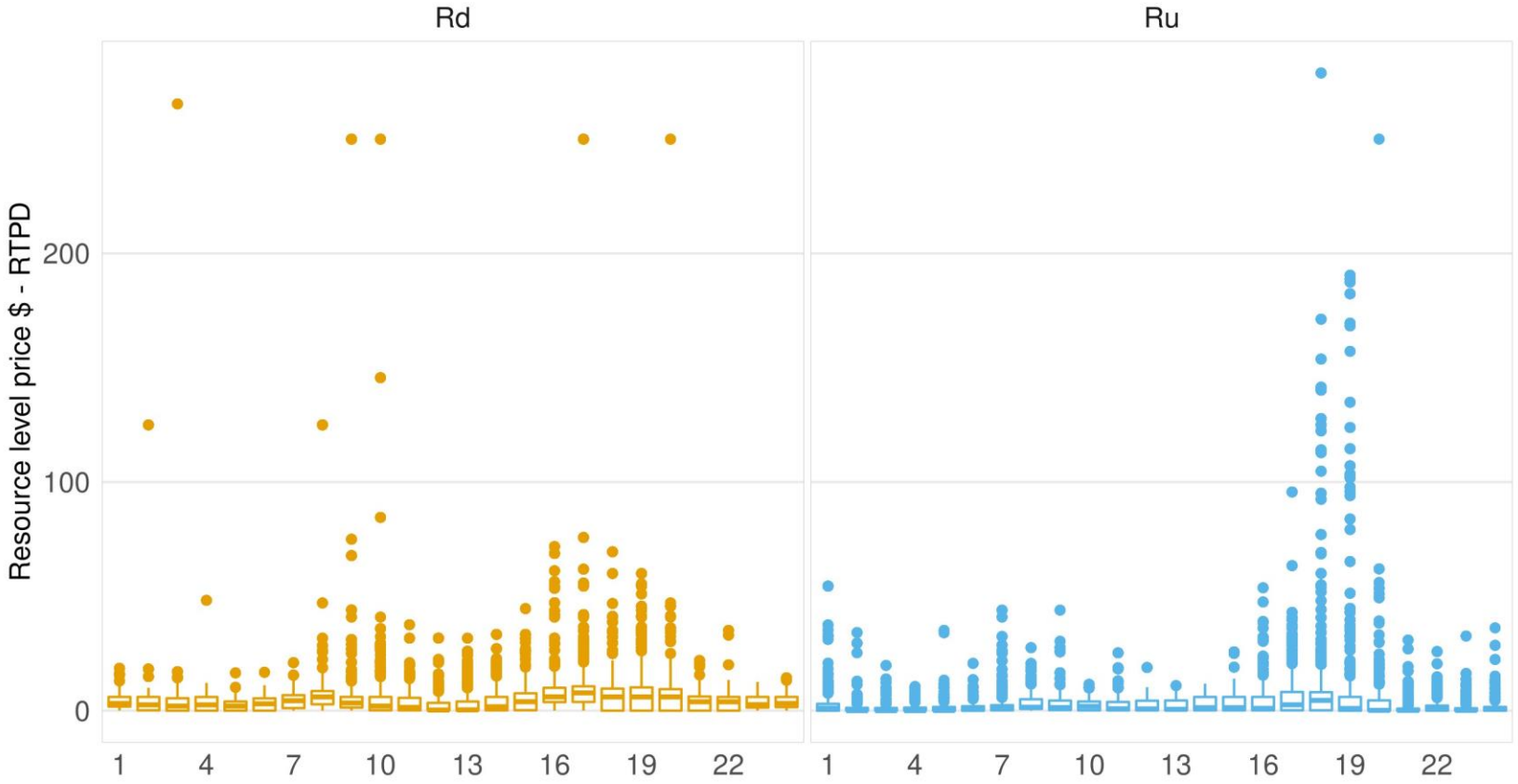
Resource Rd awards as percentage of Rd requirement sees not notable change in pattern with enhancements



IFM Resource level regulation prices have not seen negative since the implementation of the enhancements



Real-time resource level regulation prices have not been negative since the implementation of the enhancements

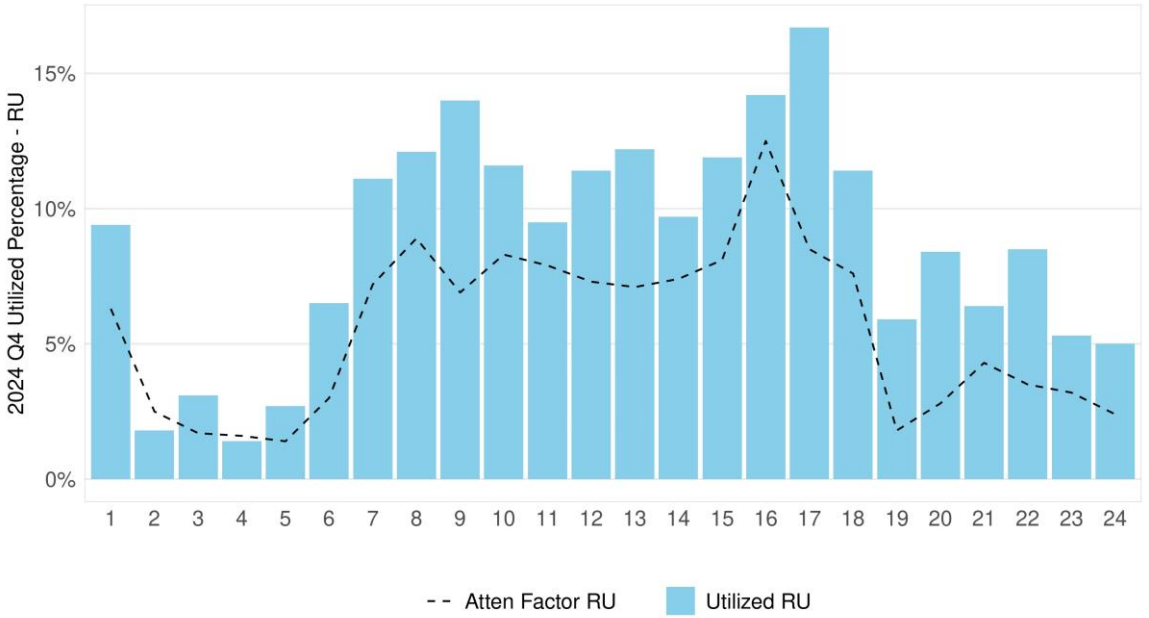


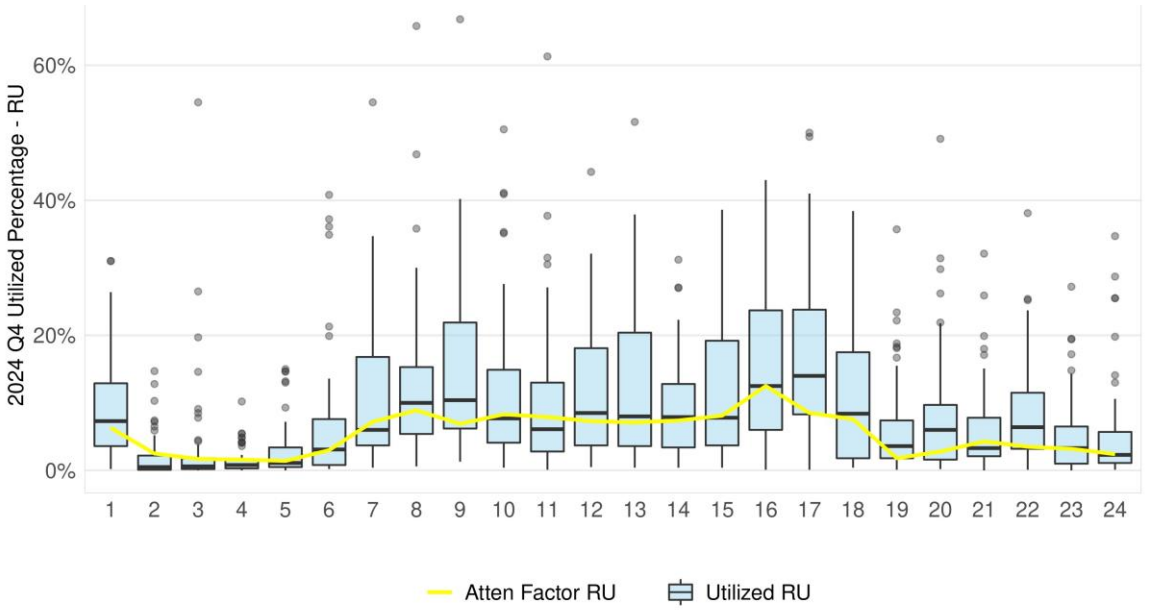
As part of the storage enhancements, the ISO estimates attenuation factors for each calendar season

- Estimating the actual utilization of regulation
- Data: the corresponding quarter from the prior year
- Metric:
  a) Data source: resource level AGC setpoint vs. DOP
  b) Reference: RTPD regulation awards
  c) System aggregated percentages

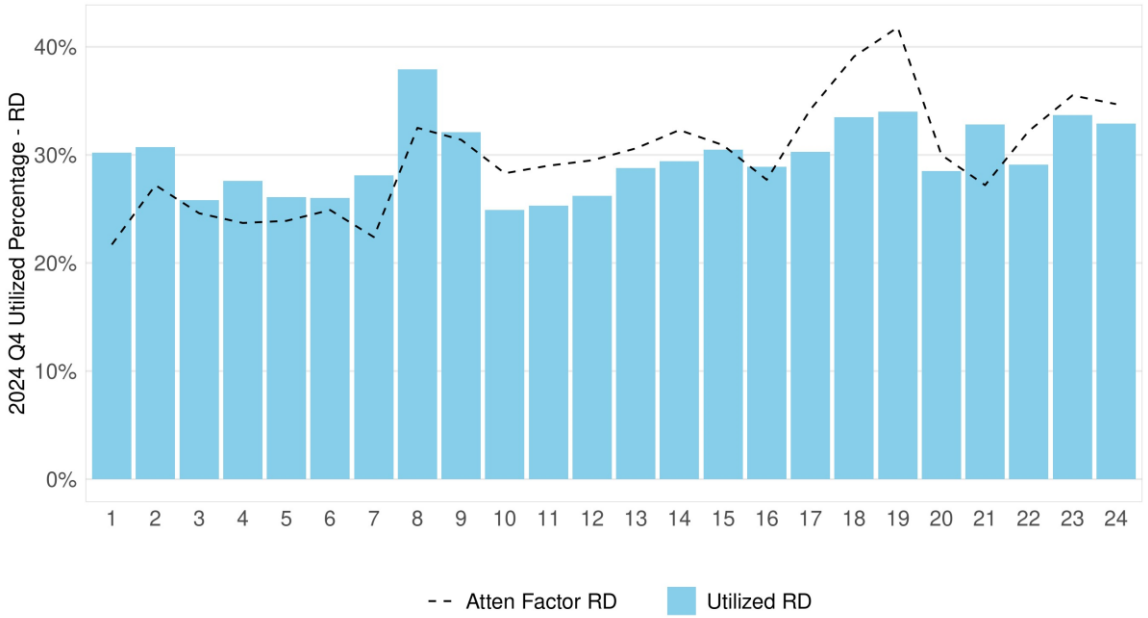
$$Percentage\ utilization\ Ru(Rd) = \frac{Total\ utilized\ Ru(Rd)}{Total\ Ru(Rd) awards}$$

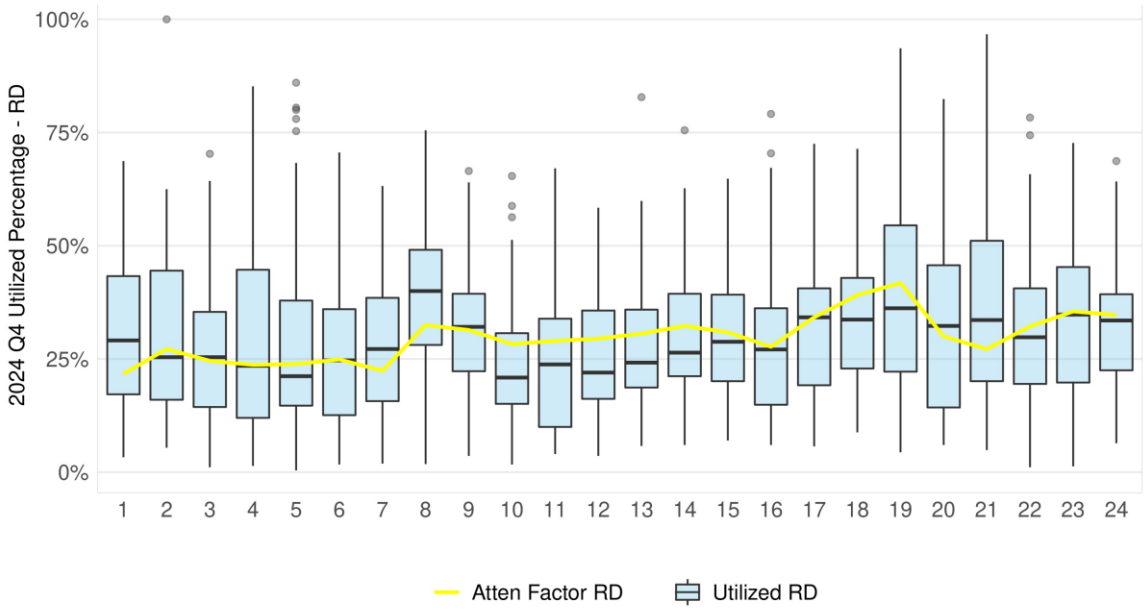
2024 Q4 (Oct – Nov) Actual utilization of regulation up remains relatively low



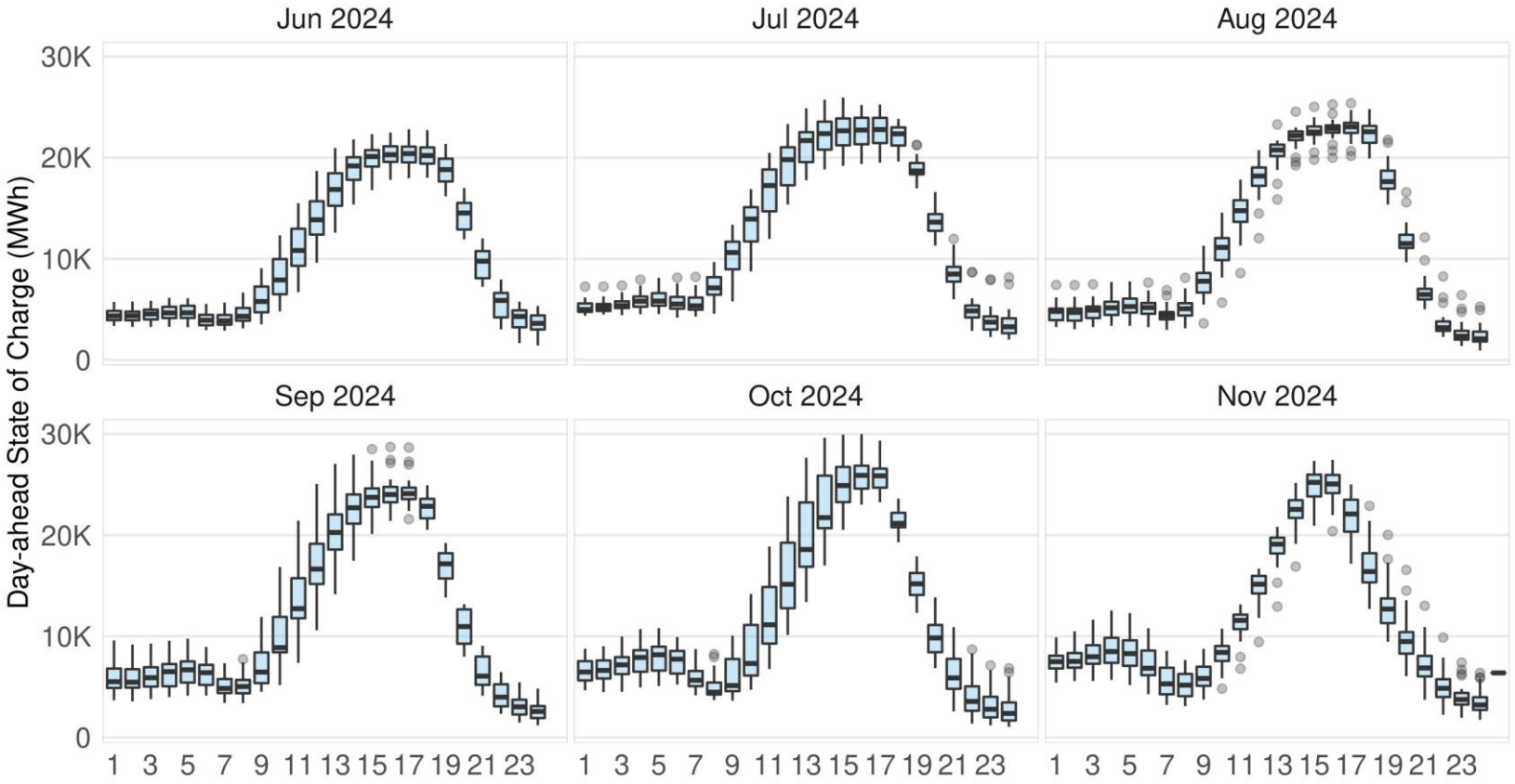


2024 Q4 (Oct – Nov) Actual utilization for regulation down continues to be high

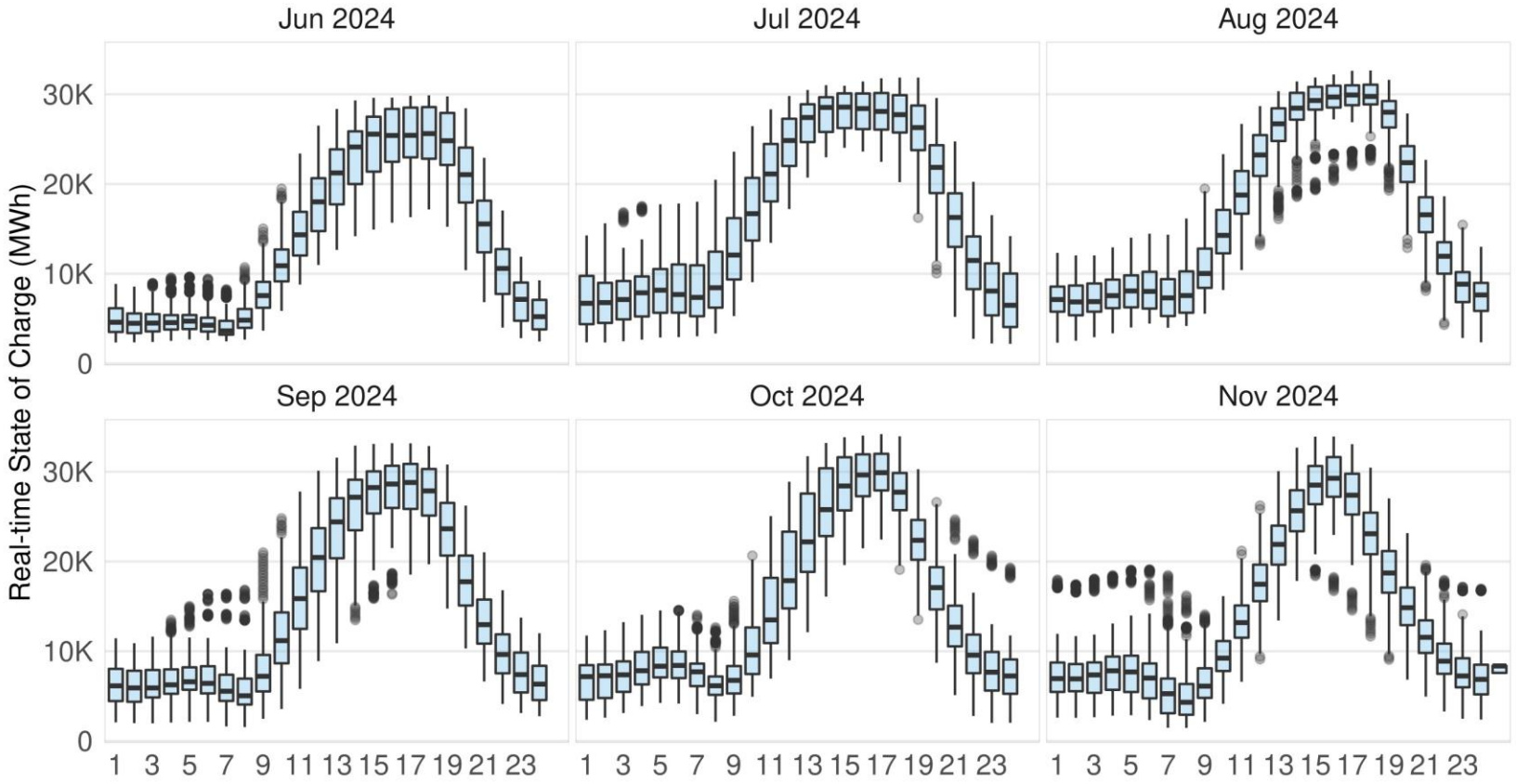




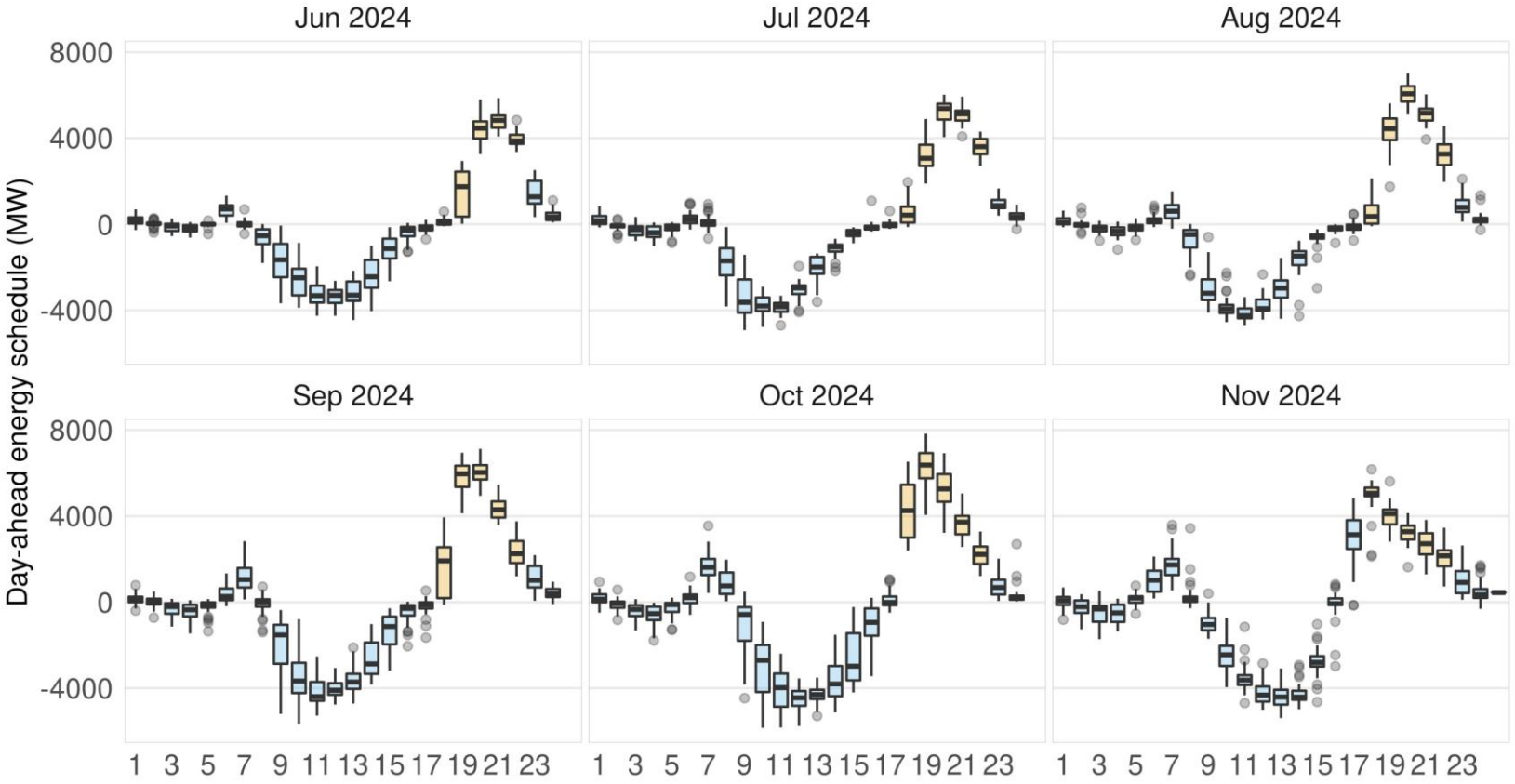
Day-Ahead state of charge for storage resources is typically achieved between hour ending 16 and 18



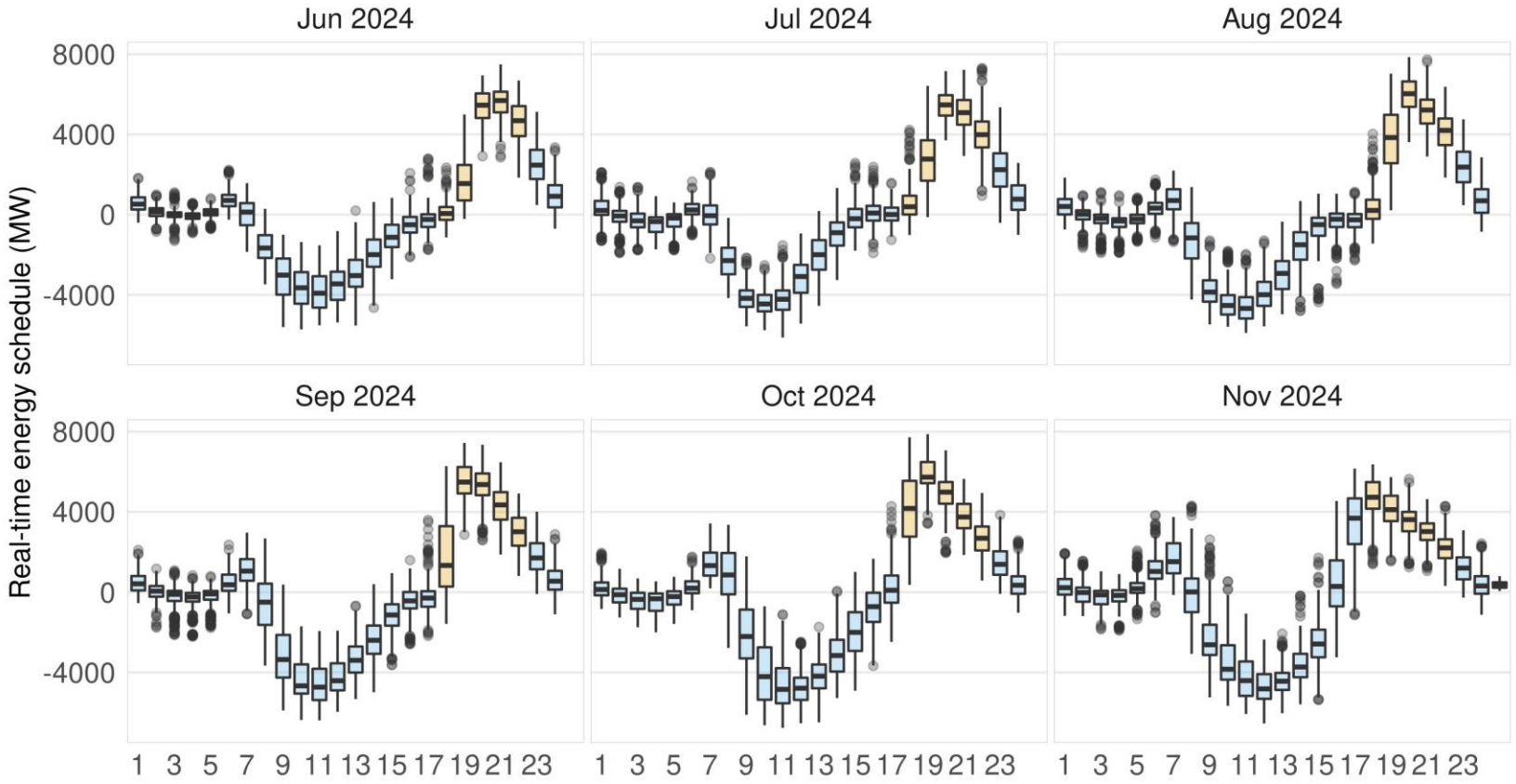
Real-Time State of charge for storage resources was in line with the day-ahead state of charge



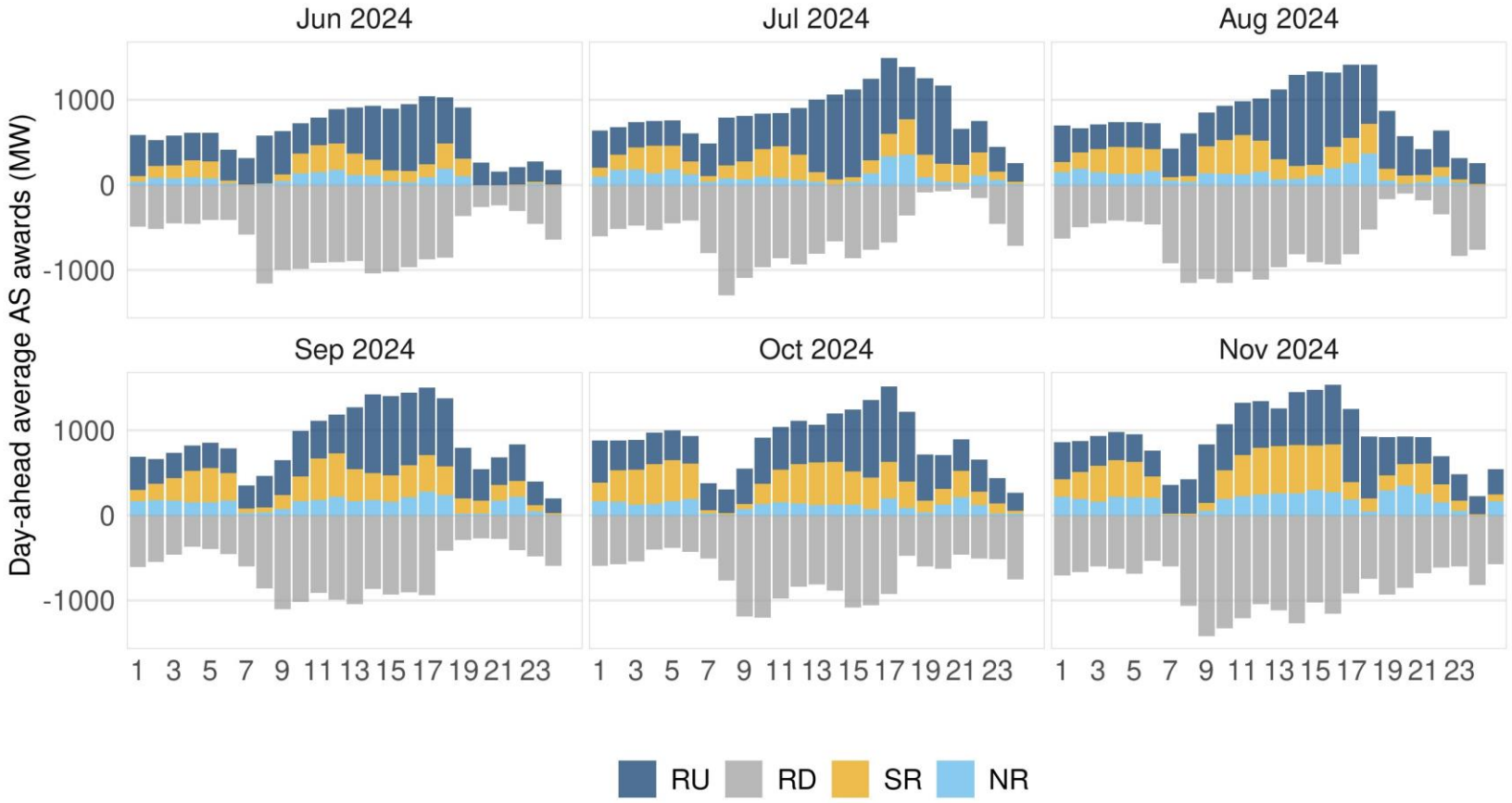
Storage resources were consistently charging during solar hours and discharging during net load peaks



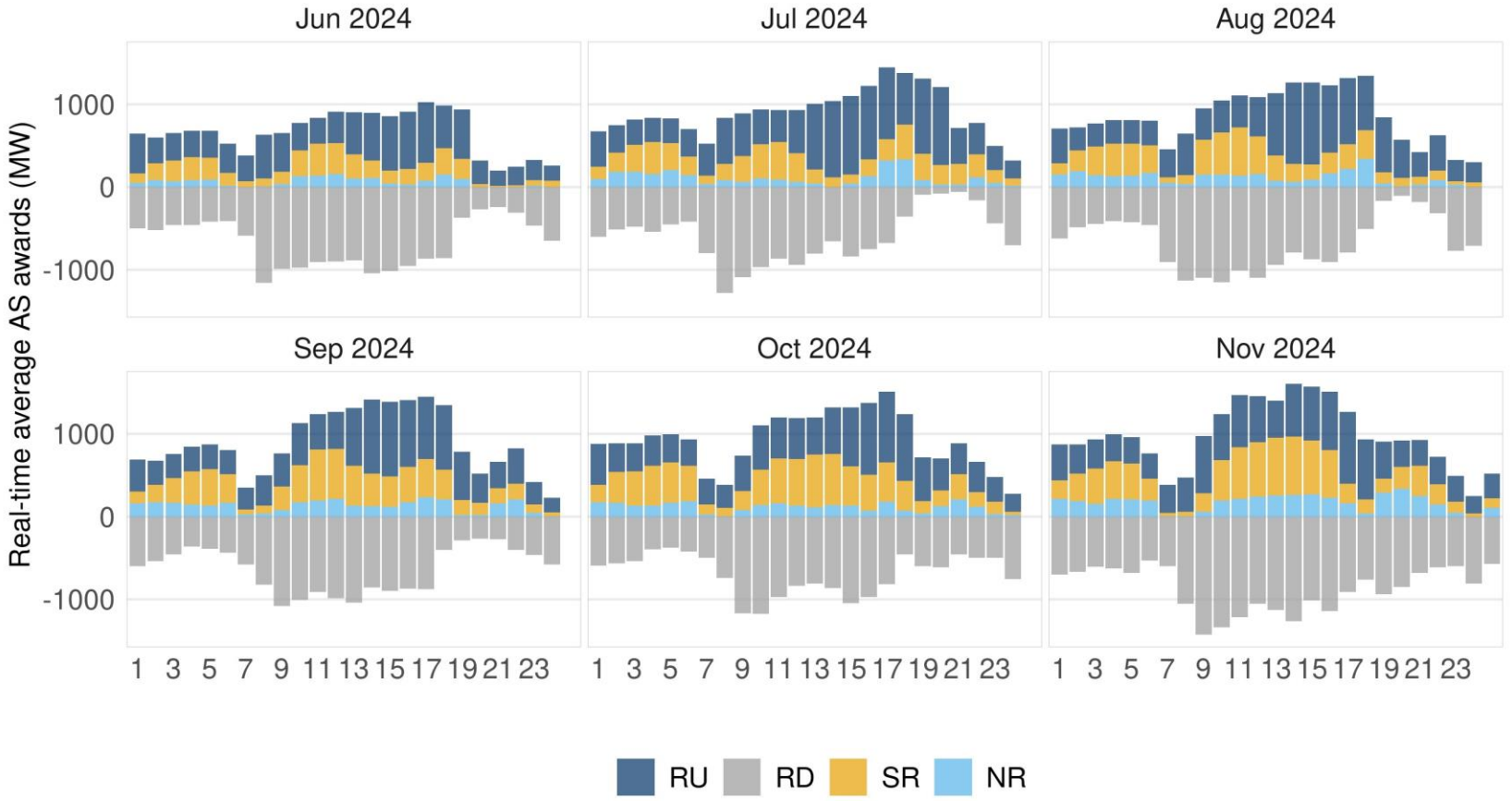
Storage resources were consistently charging during solar hours and discharging during net load peaks, and reached new highs at 8,000MW



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

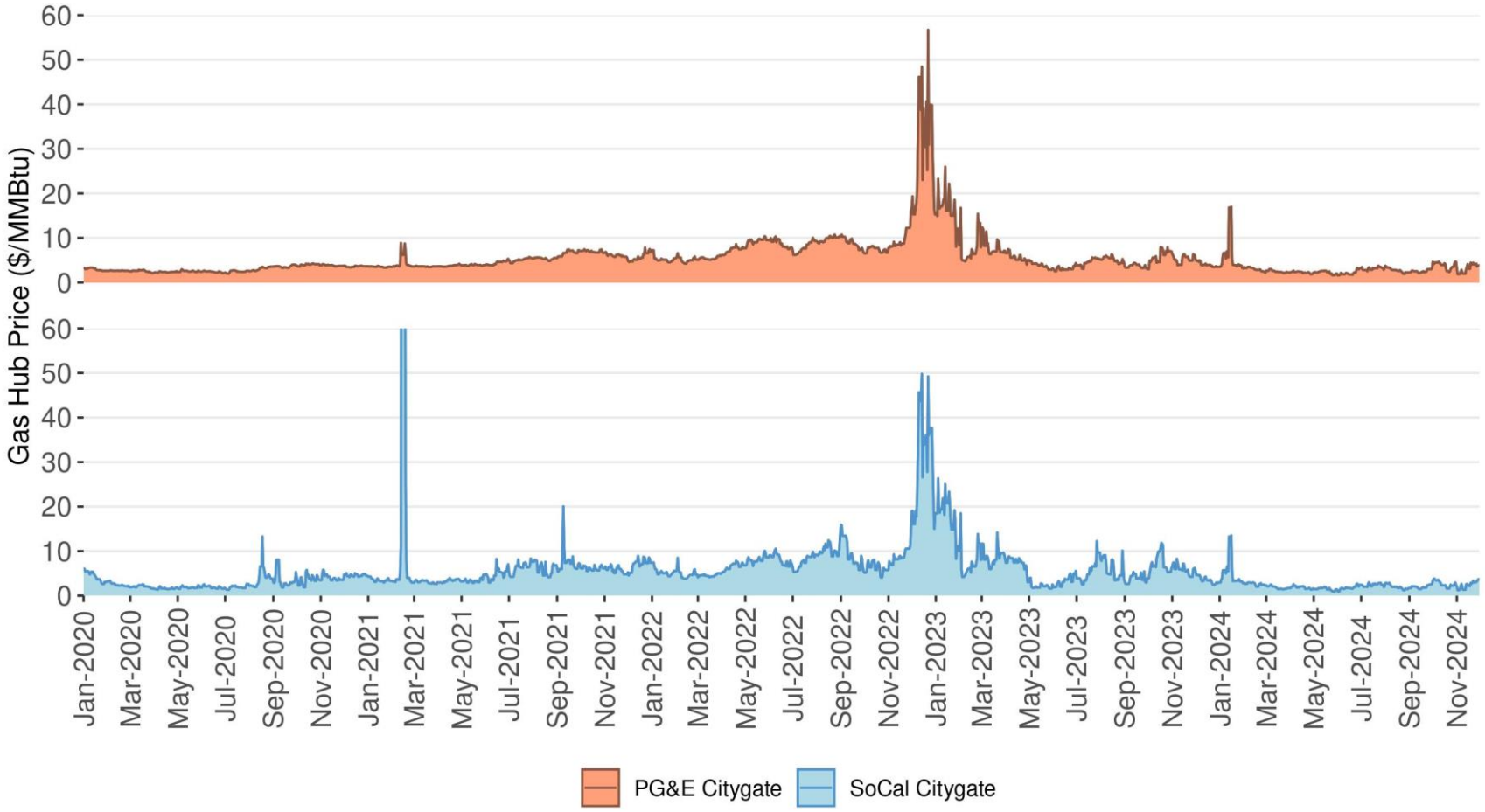


Storage resources procure mostly regulation while in recent months they have also increased the provision of Spinning reserves. Real time

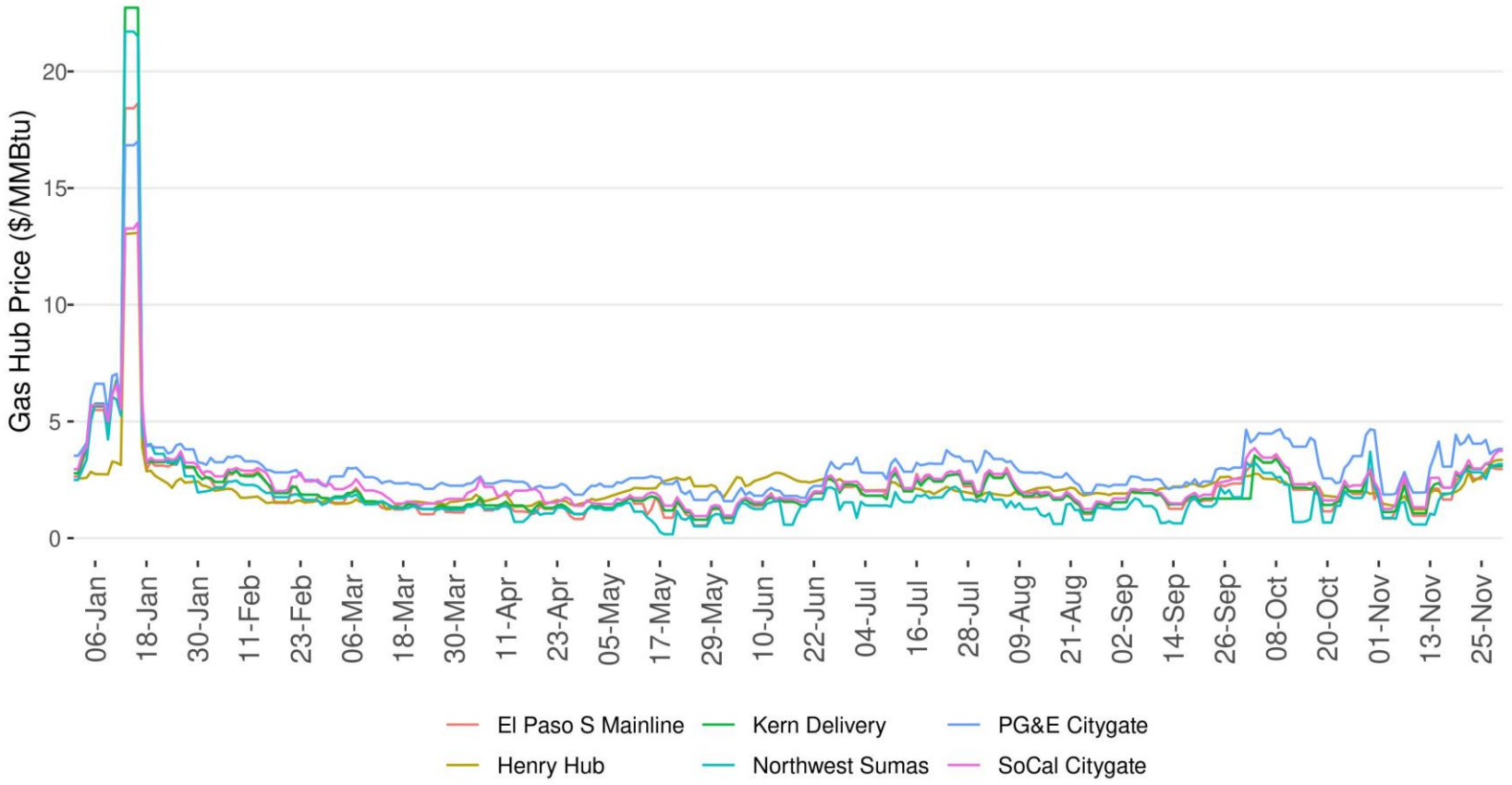


Gas and Power Index Prices
CAISO Market Costs

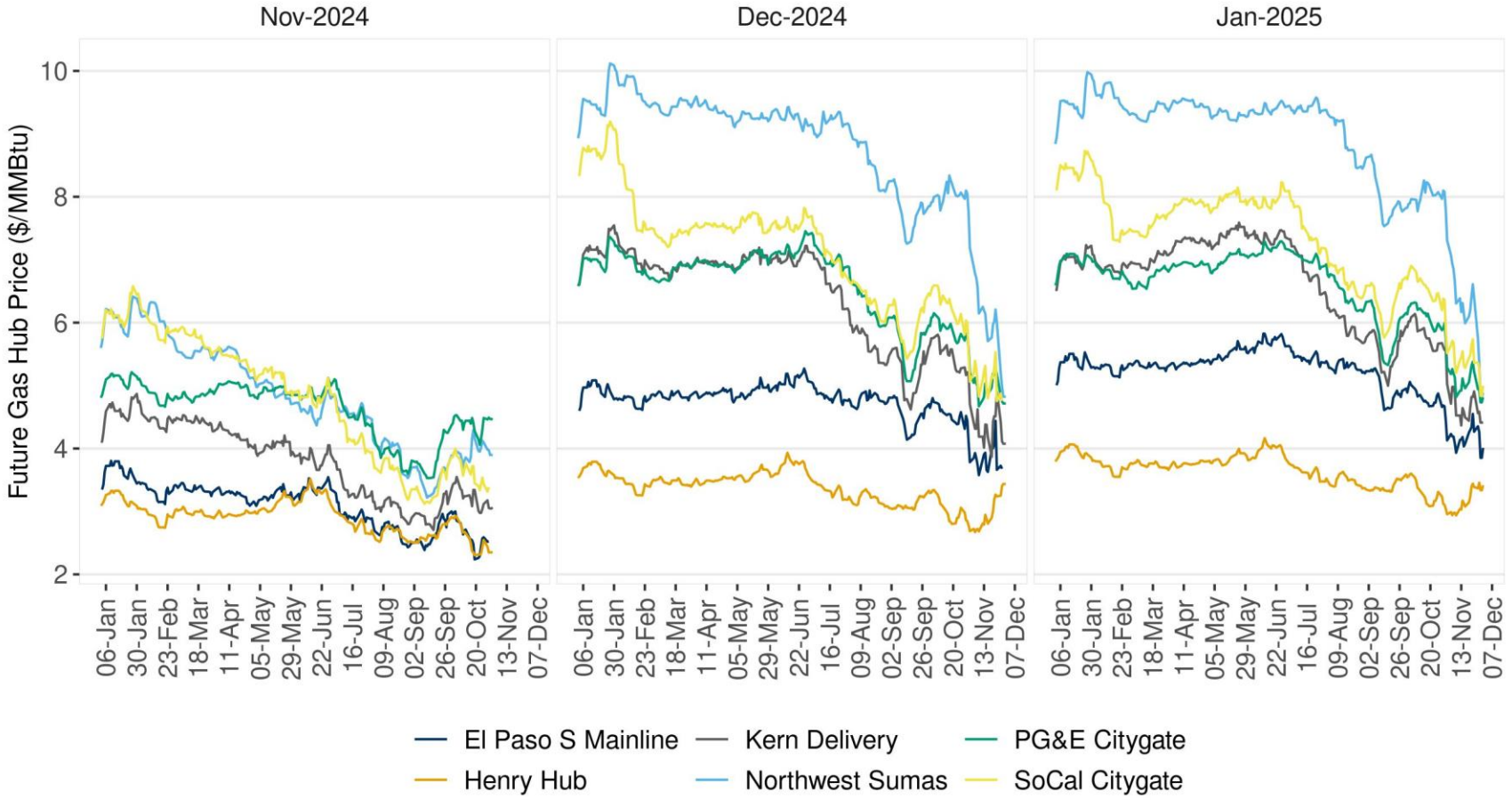
California next-day gas prices has seen lower levels in 2024 compared to 2023



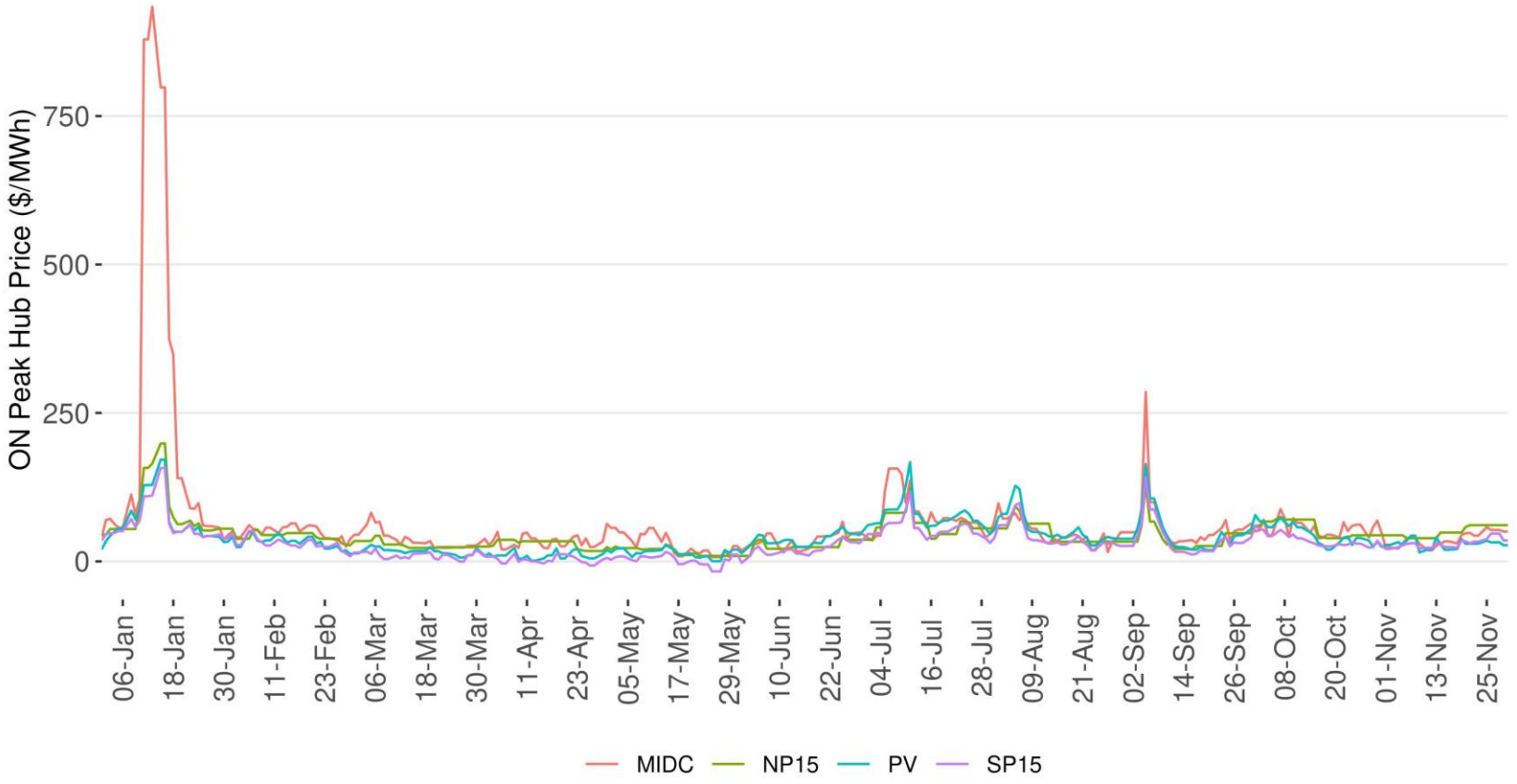
Western next-day gas prices reached elevated levels in mid-January 2024 and continue to be lower for 2024



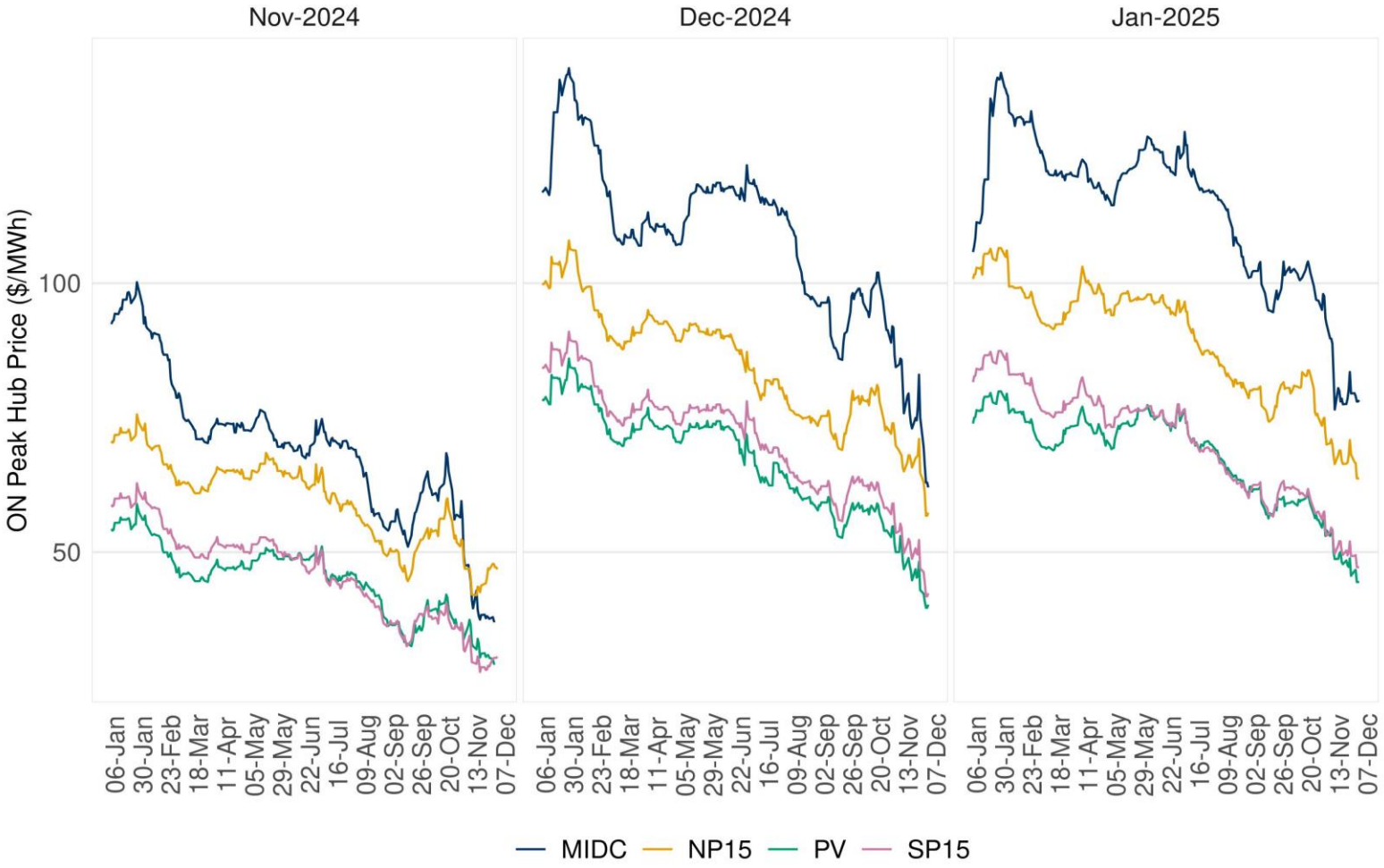
Future gas prices for summer 2024 and Autumn remain stable



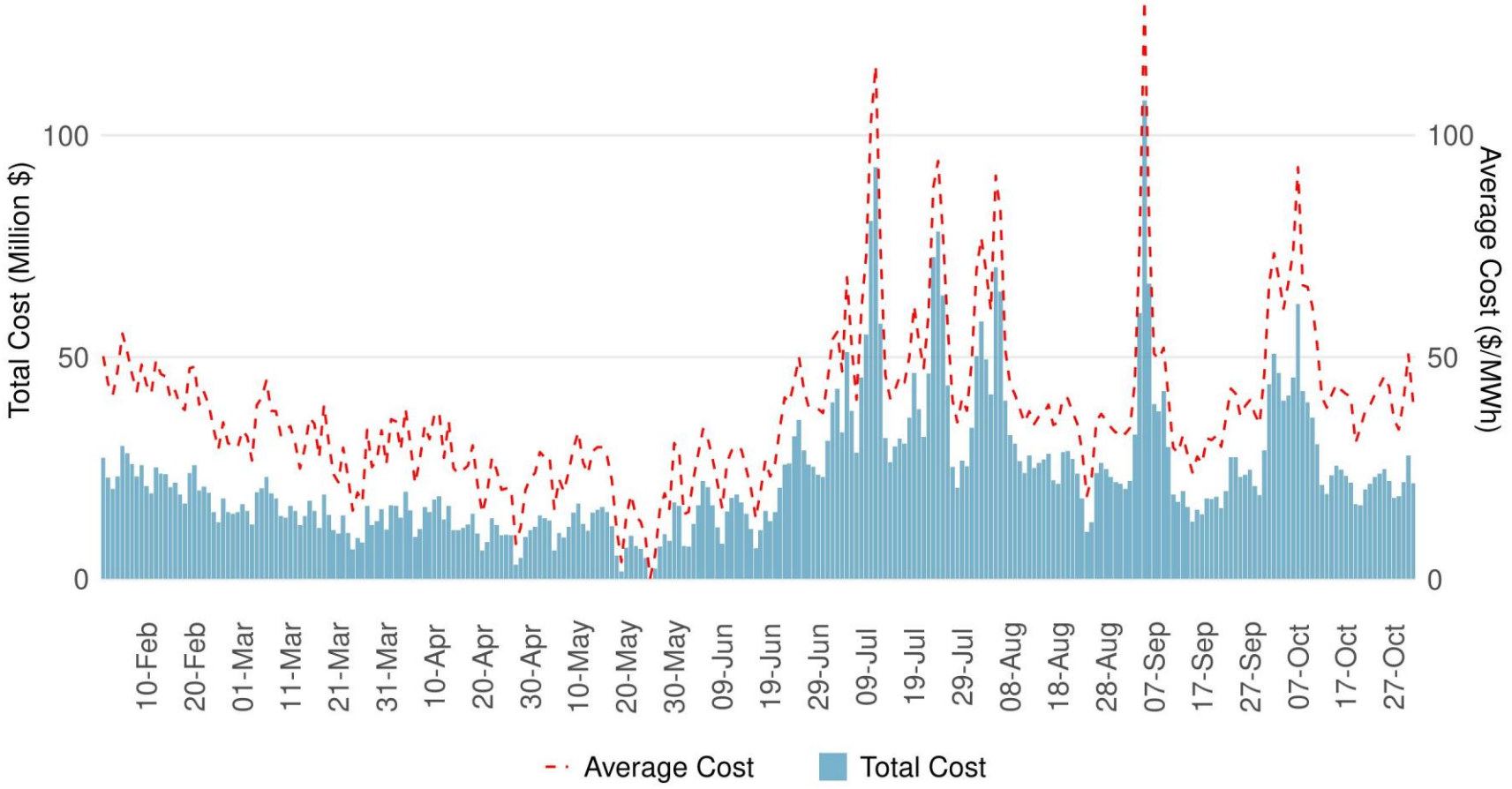
Next-day on-peak bilateral power prices spiking above $250/MWh at the Mid-C hub on September 5, 2024 and remained low in October 2024



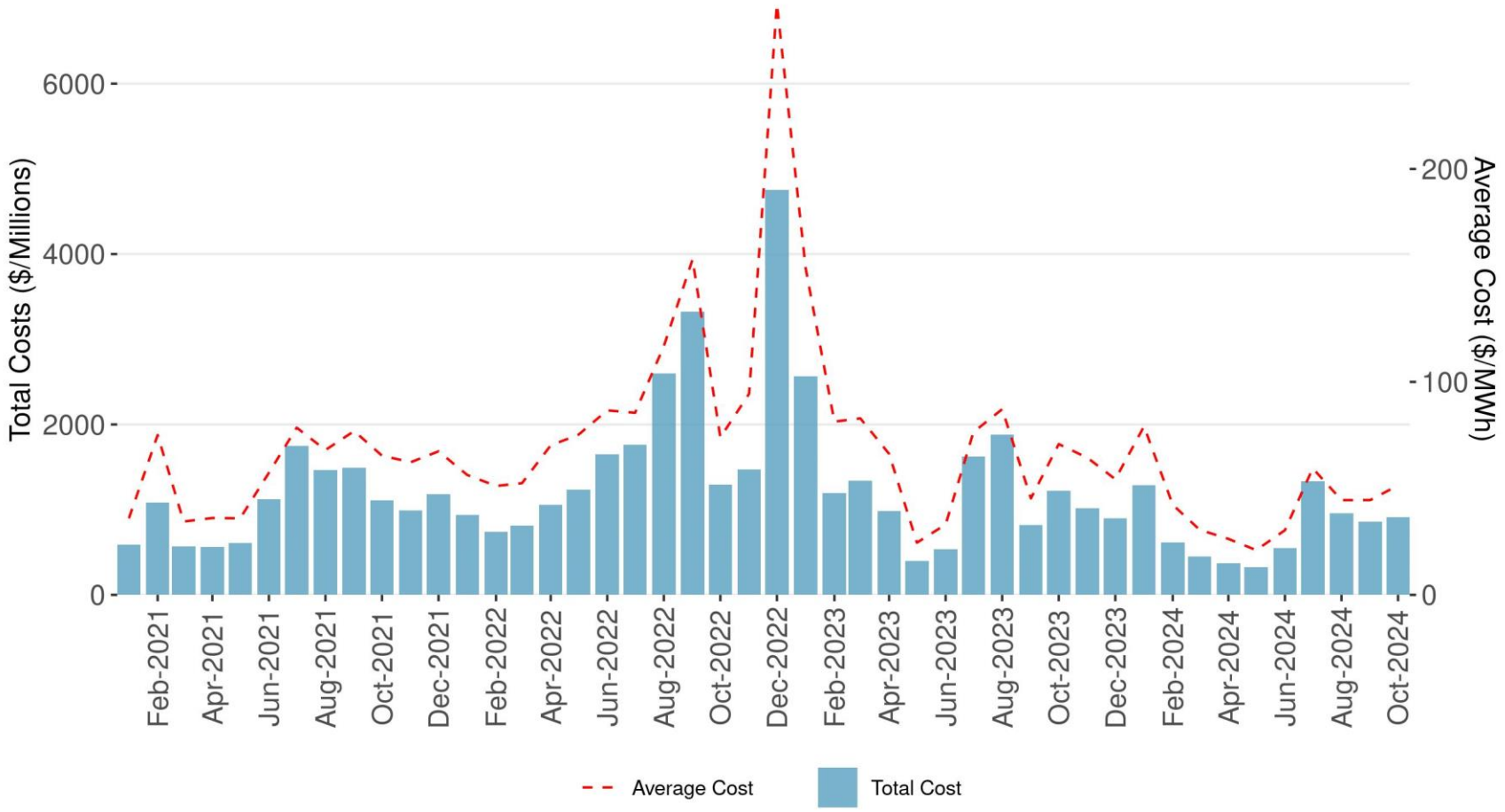
Future on-peak bilateral power prices for summer 2024 remained fairly low for November, but increasing for other future months.



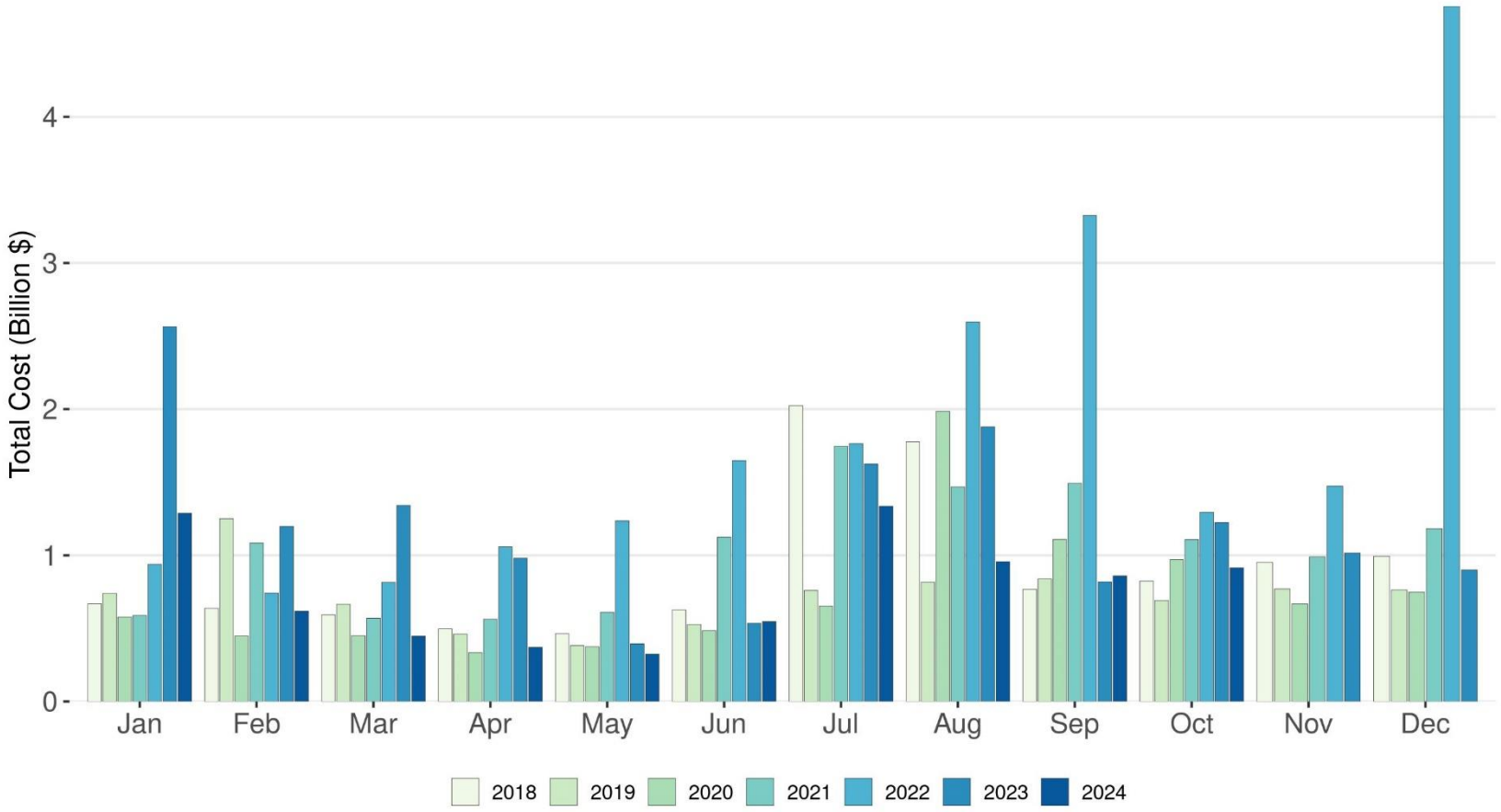
Daily market costs reached the highest level on September 5th, 2024



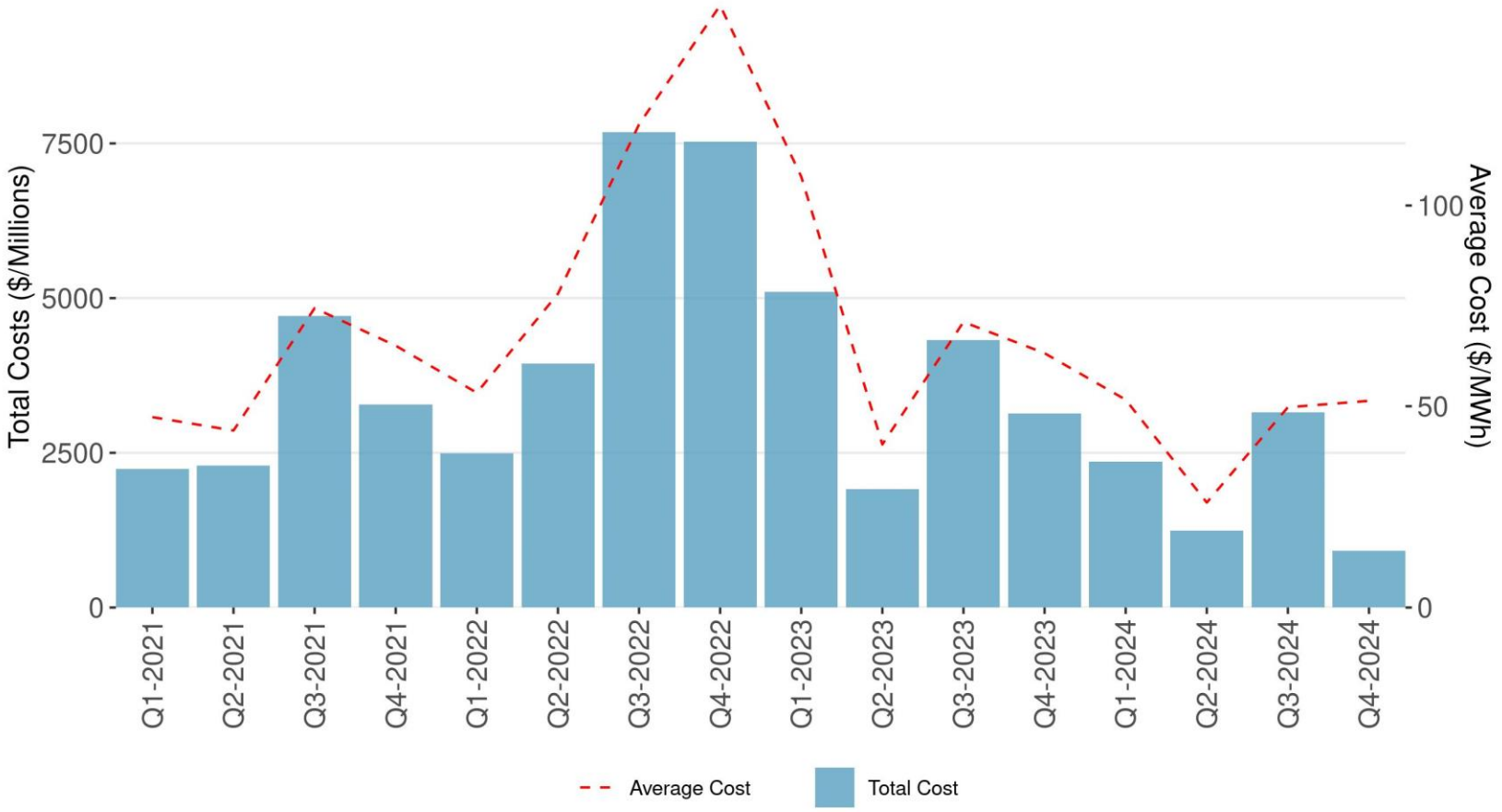
Monthly totals for 2024 remained low compared to previous years



Monthly totals for third Quarter 2024 are lower than previous year.



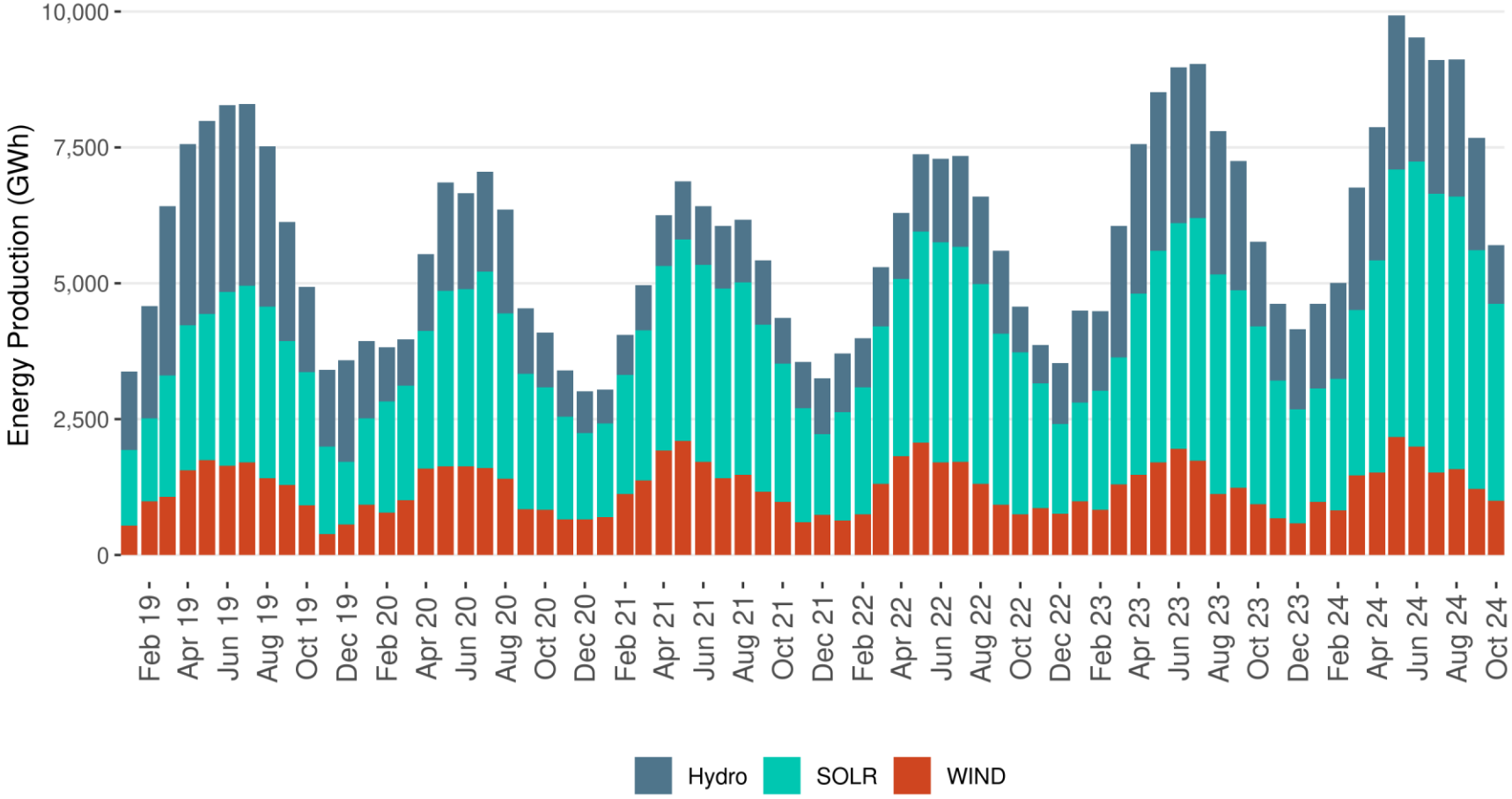
Q3 2024 total costs are $2.3B lower than Q3 2023 total costs.



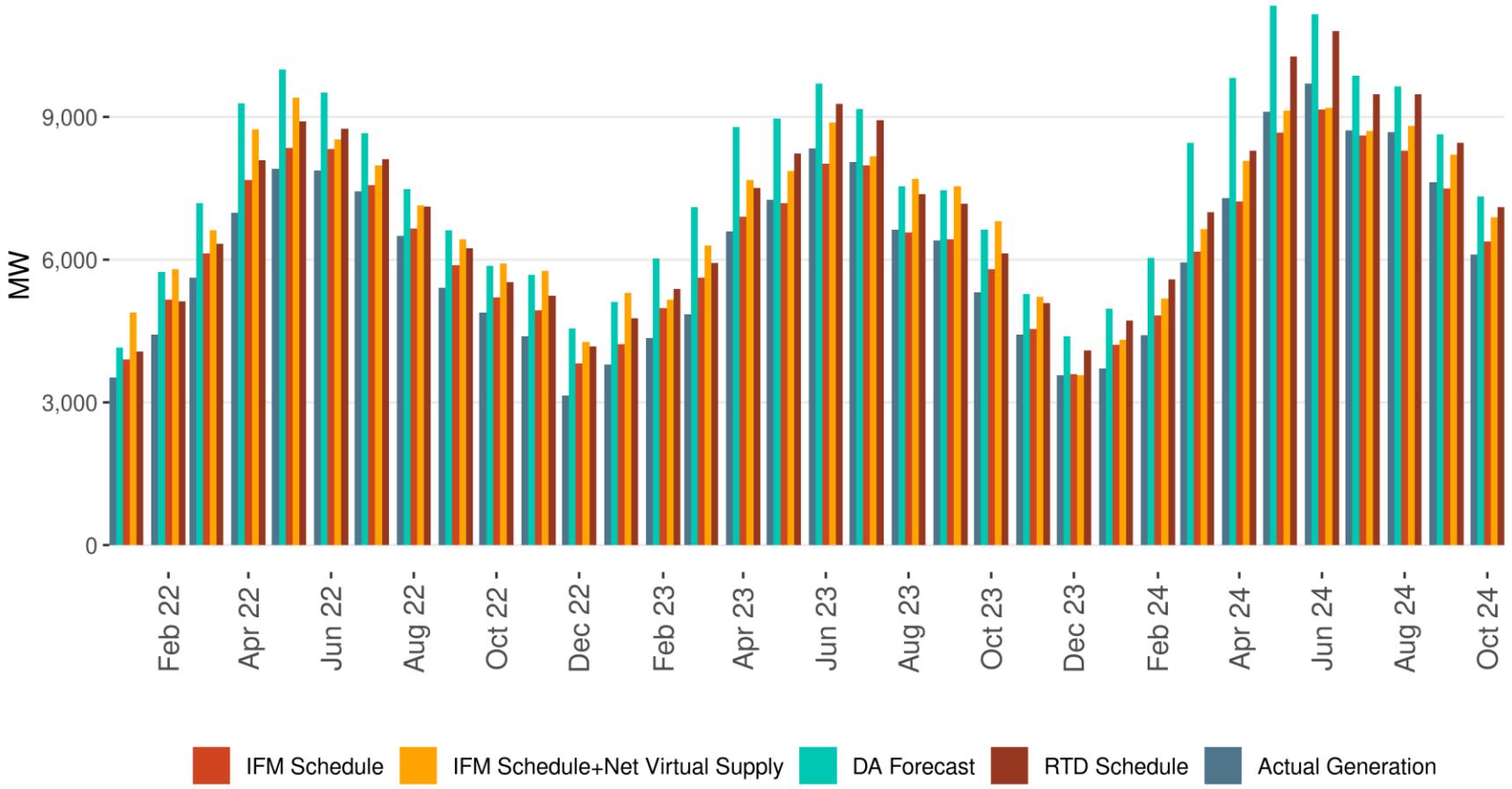
Note: Q4 2024 includes data for September and October

General Market Performance Metrics

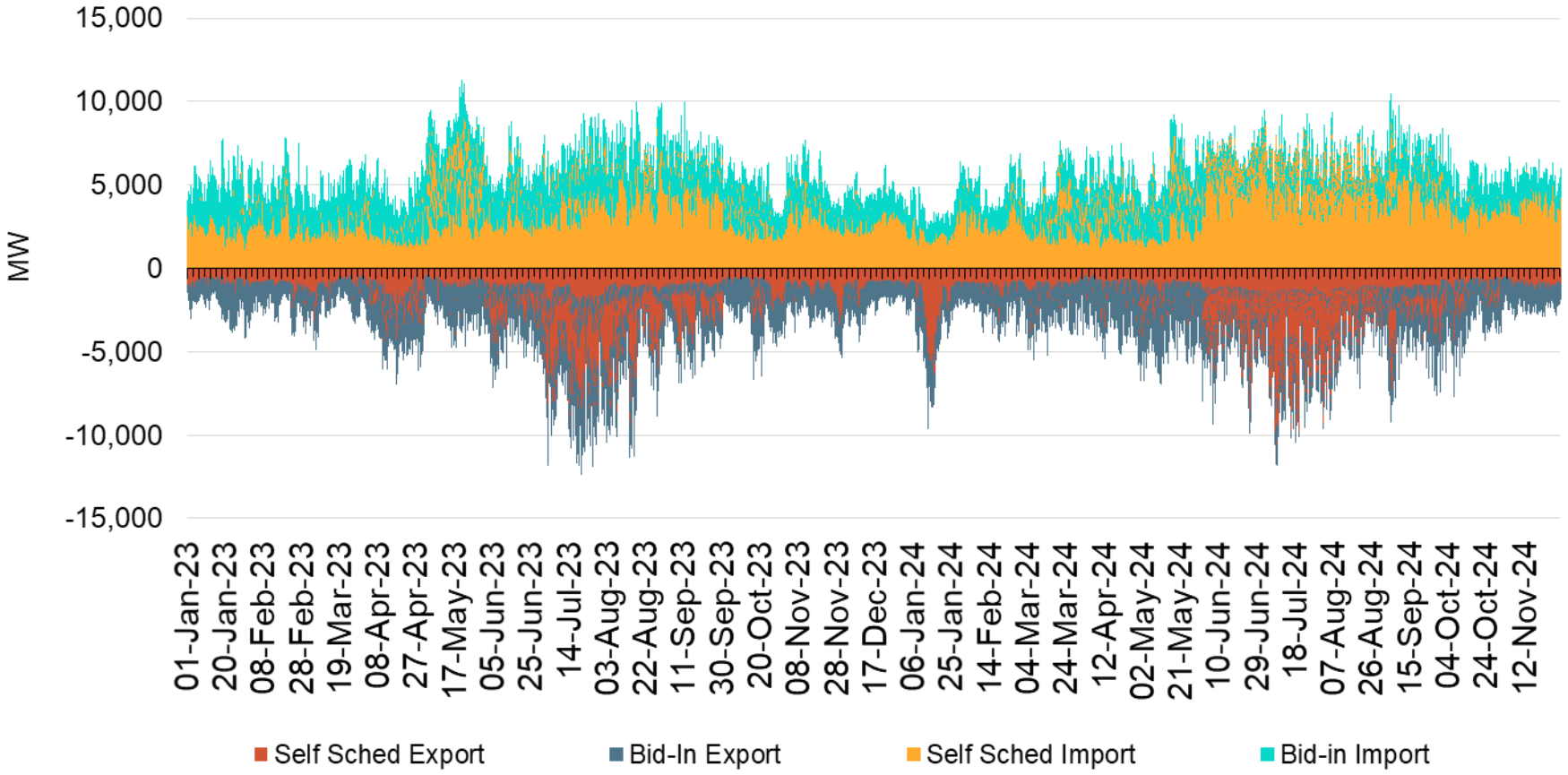
Hydro production trending higher in 2024 than previous years, complementing higher solar production



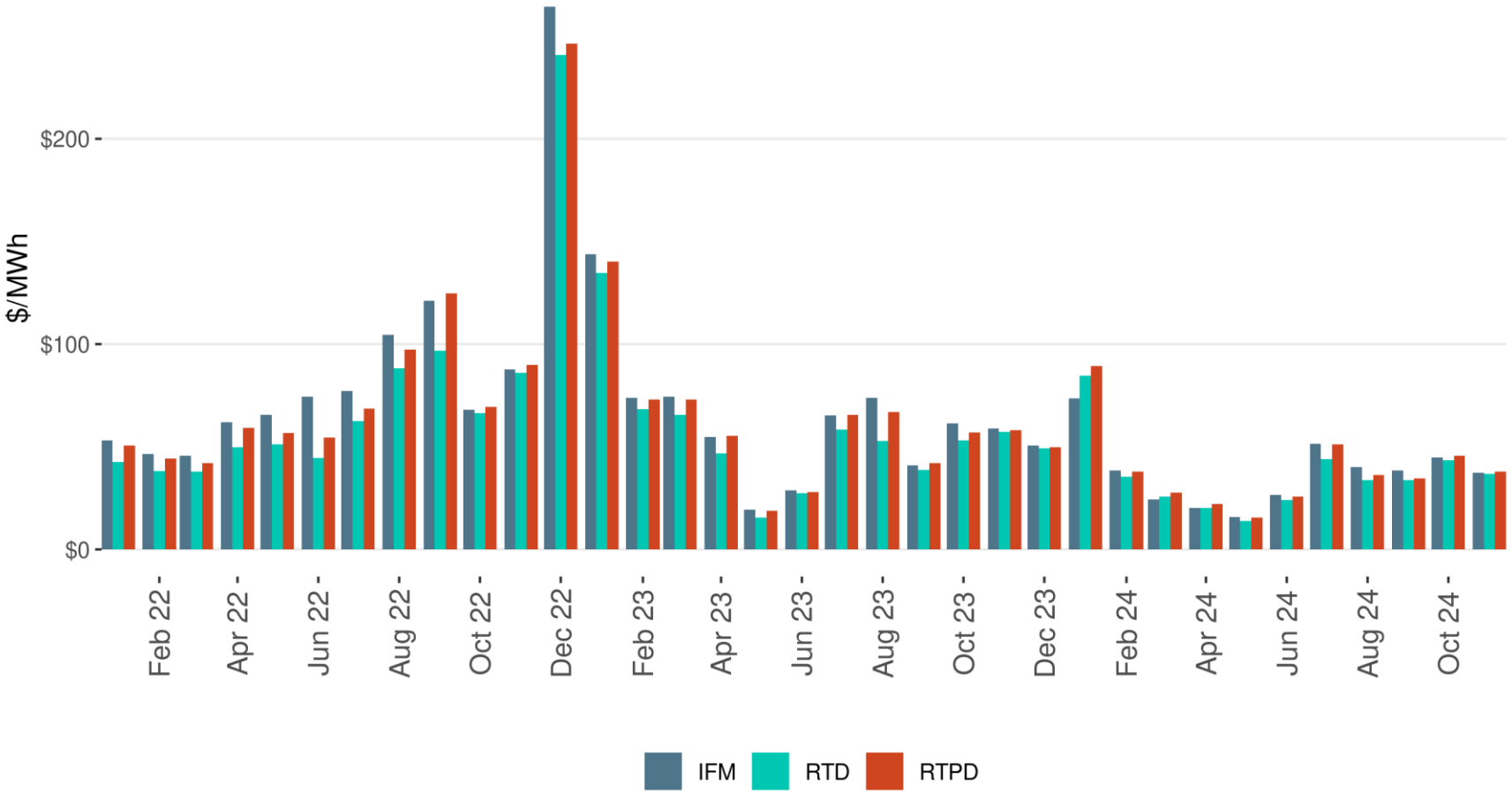
ISO total monthly VERS schedules and forecasts compared to actuals



Self scheduled imports fell since September

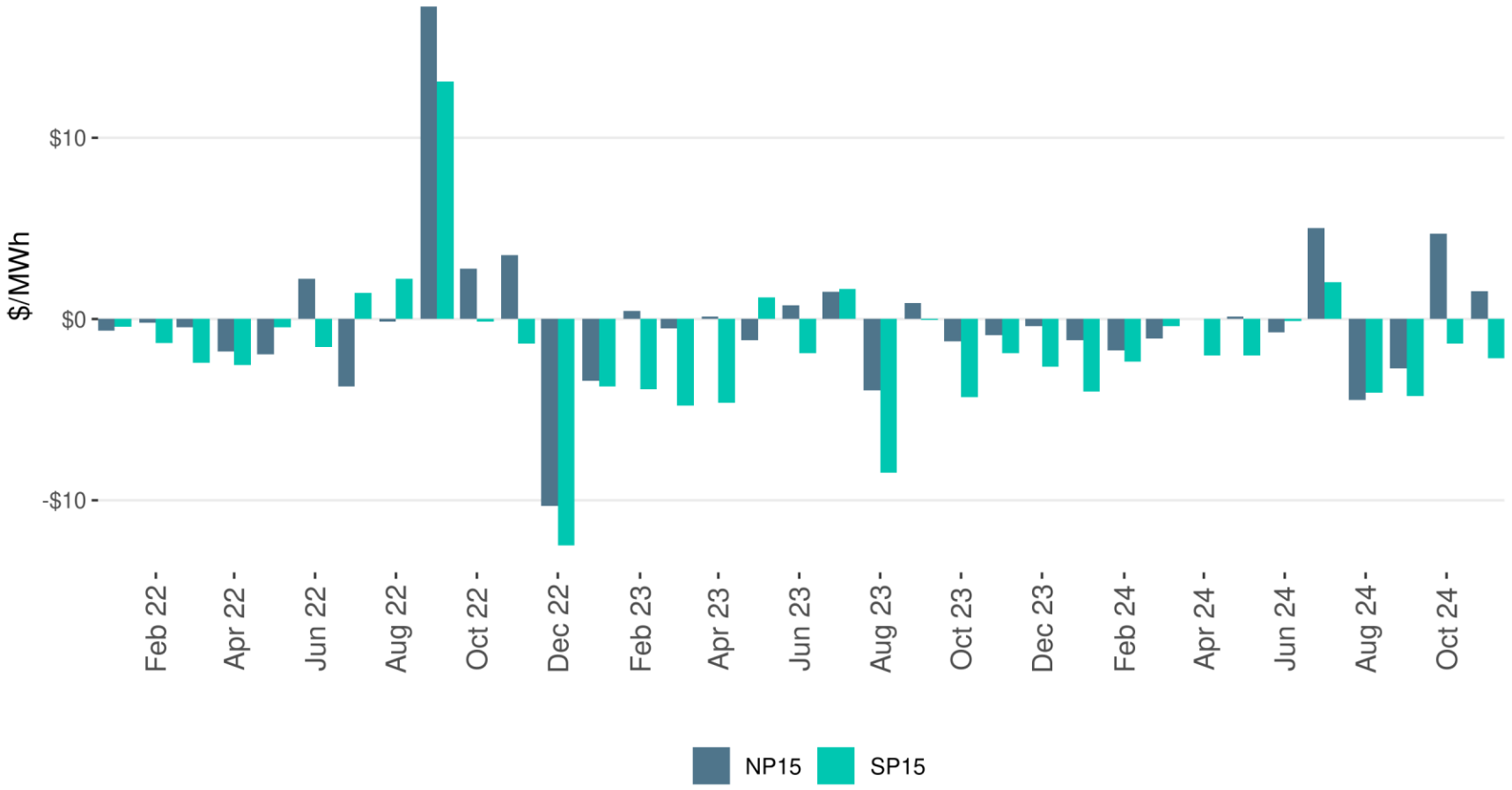


Prices remain stable after since summer conditions

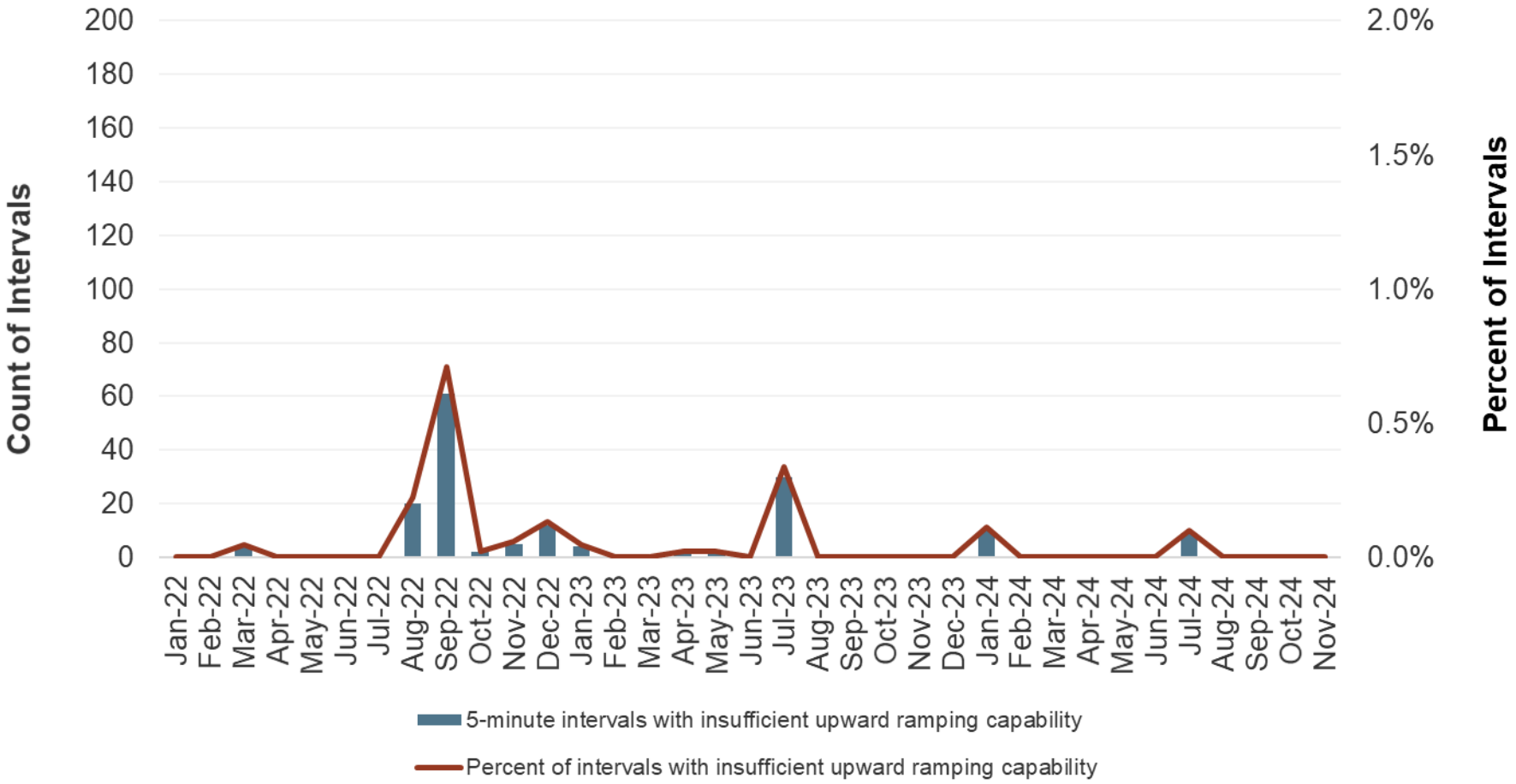


Note: Metric Based on System Marginal Energy Component (SMEC)

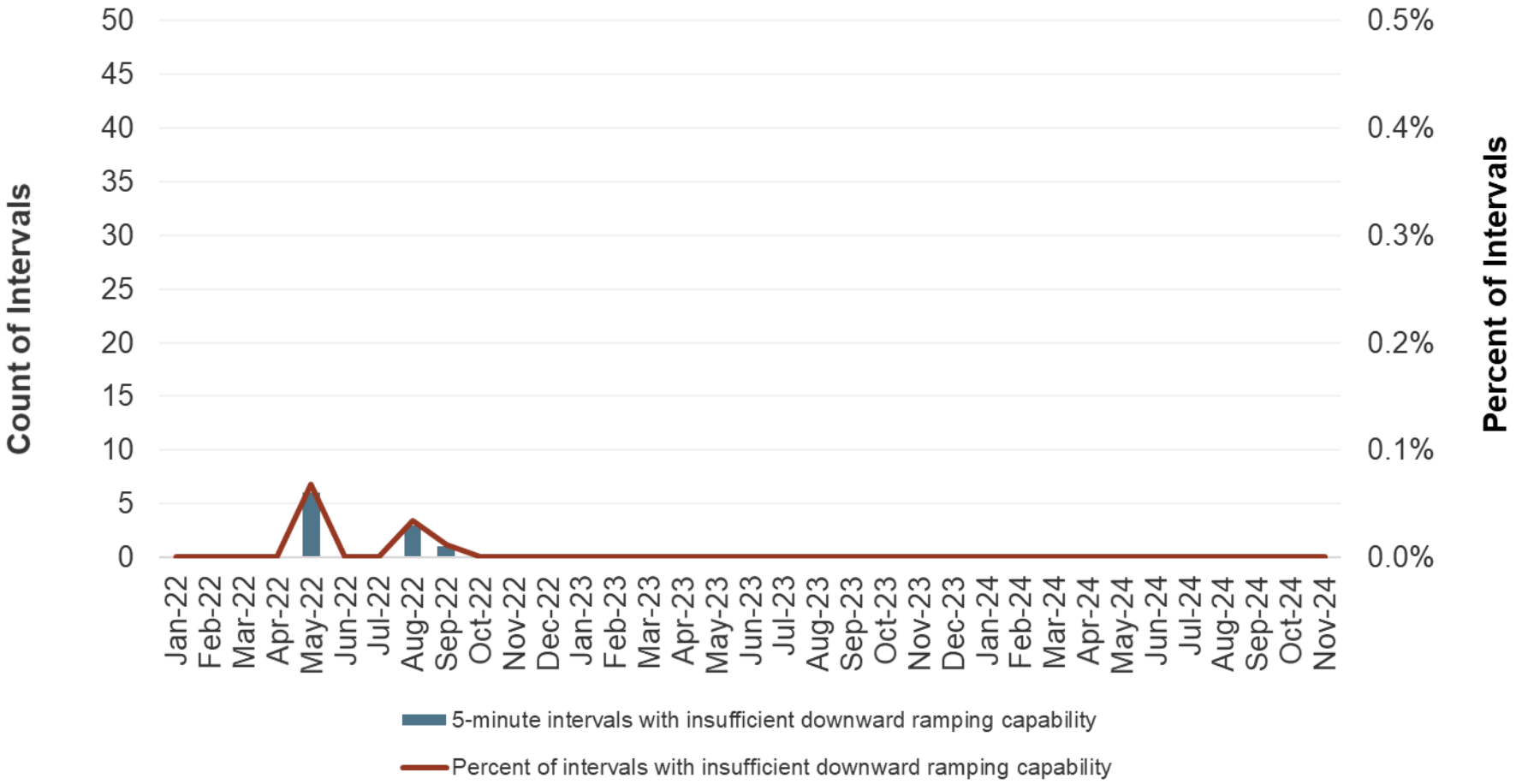
Real-time prices higher than day-ahead prices for NP15 in both October and November



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

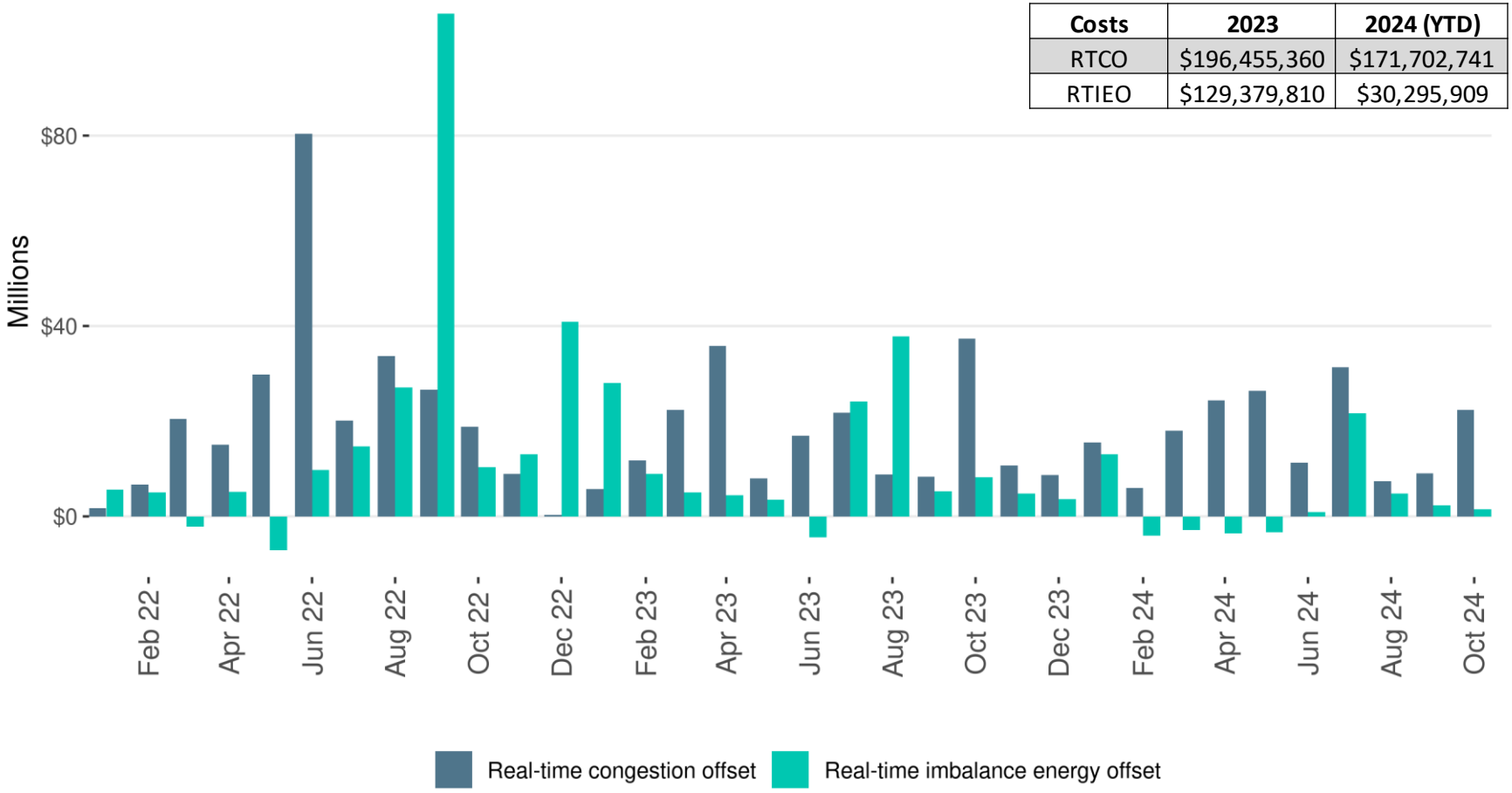


Insufficient downward ramping capacity in real-time remained low

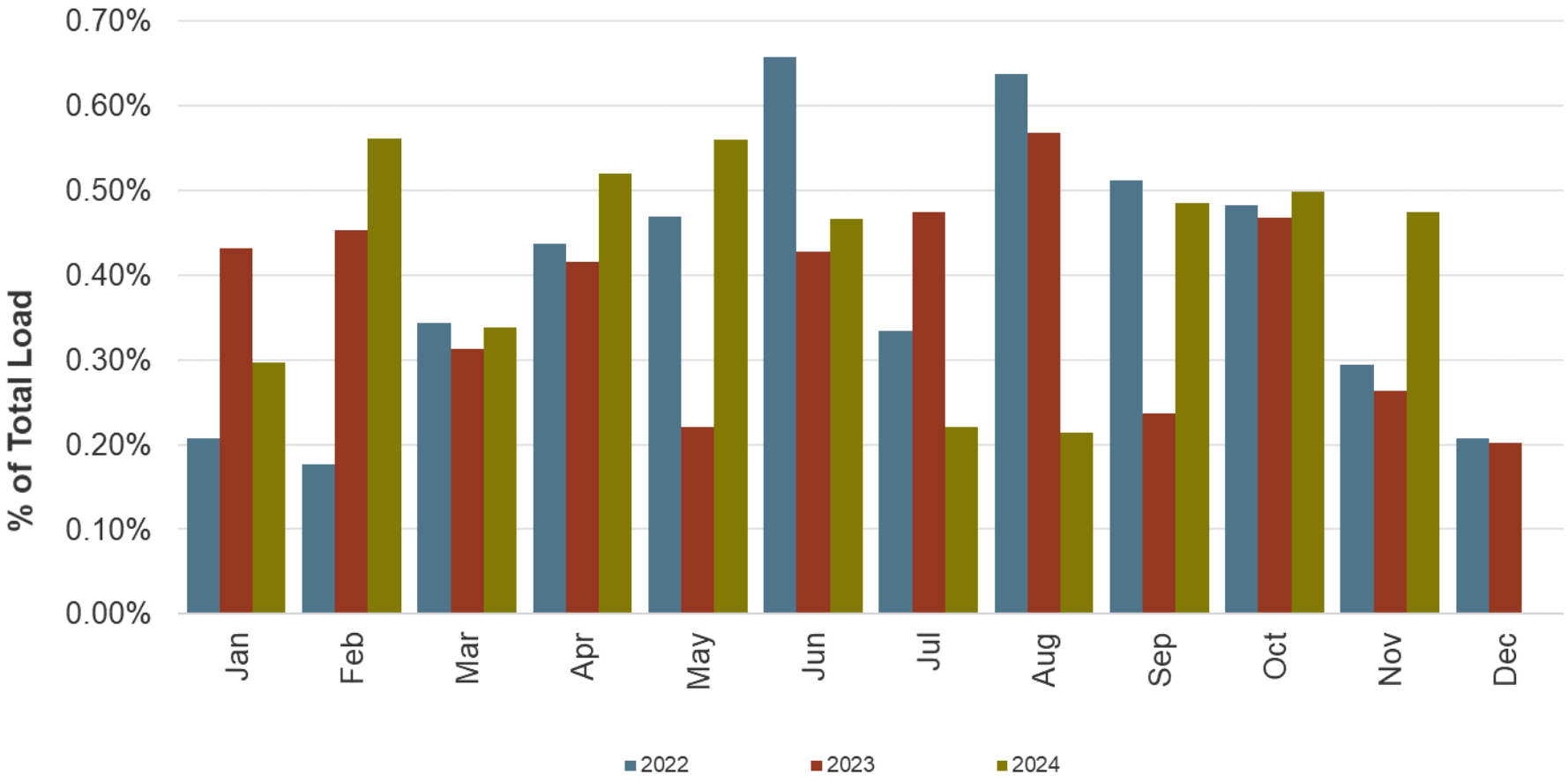


ISO area real-time congestion offset cost increased since August

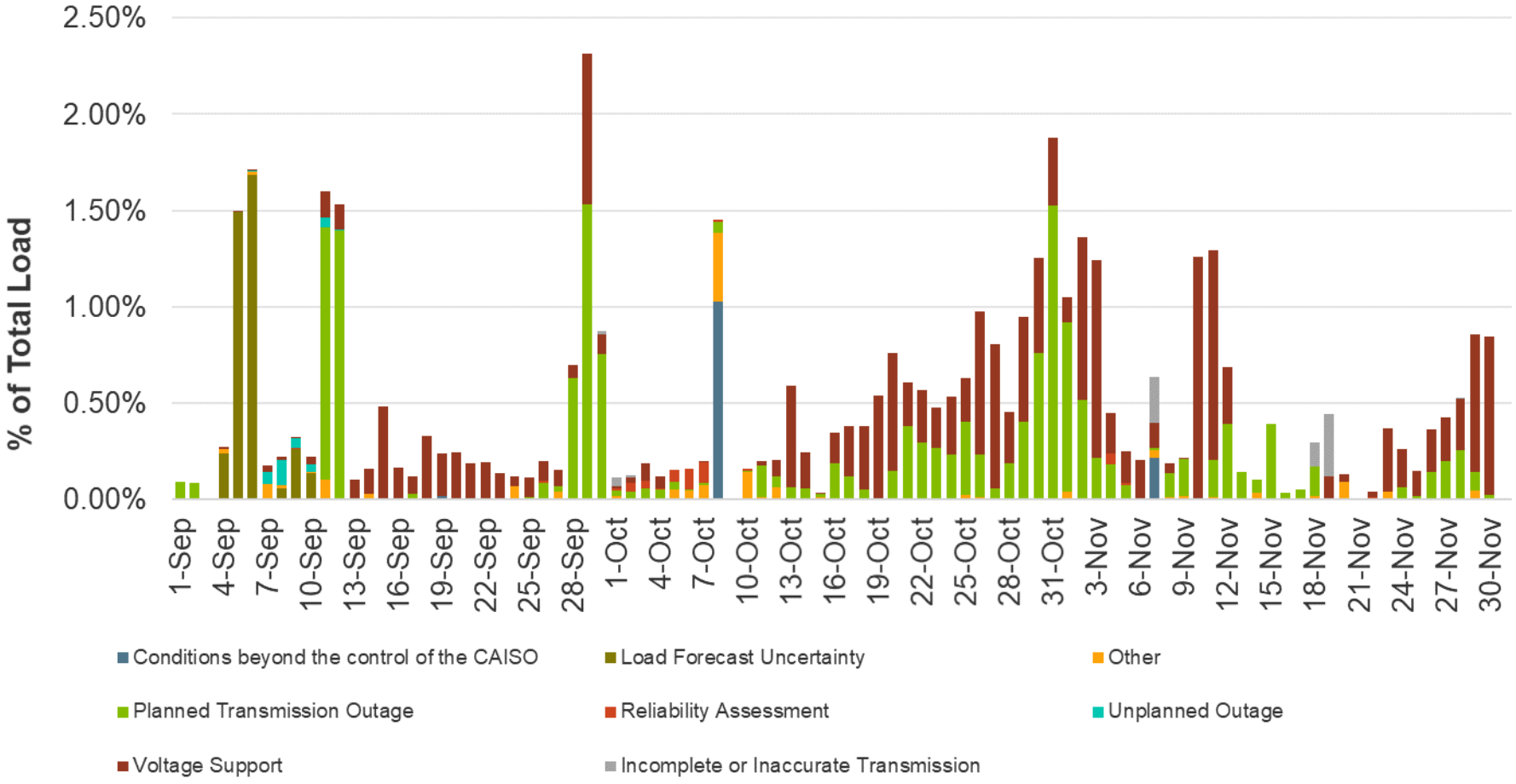
Costs	2023	2024 (YTD)
RTCO	$196,455,360	$171,702,741
RTIEO	$129,379,810	$30,295,909



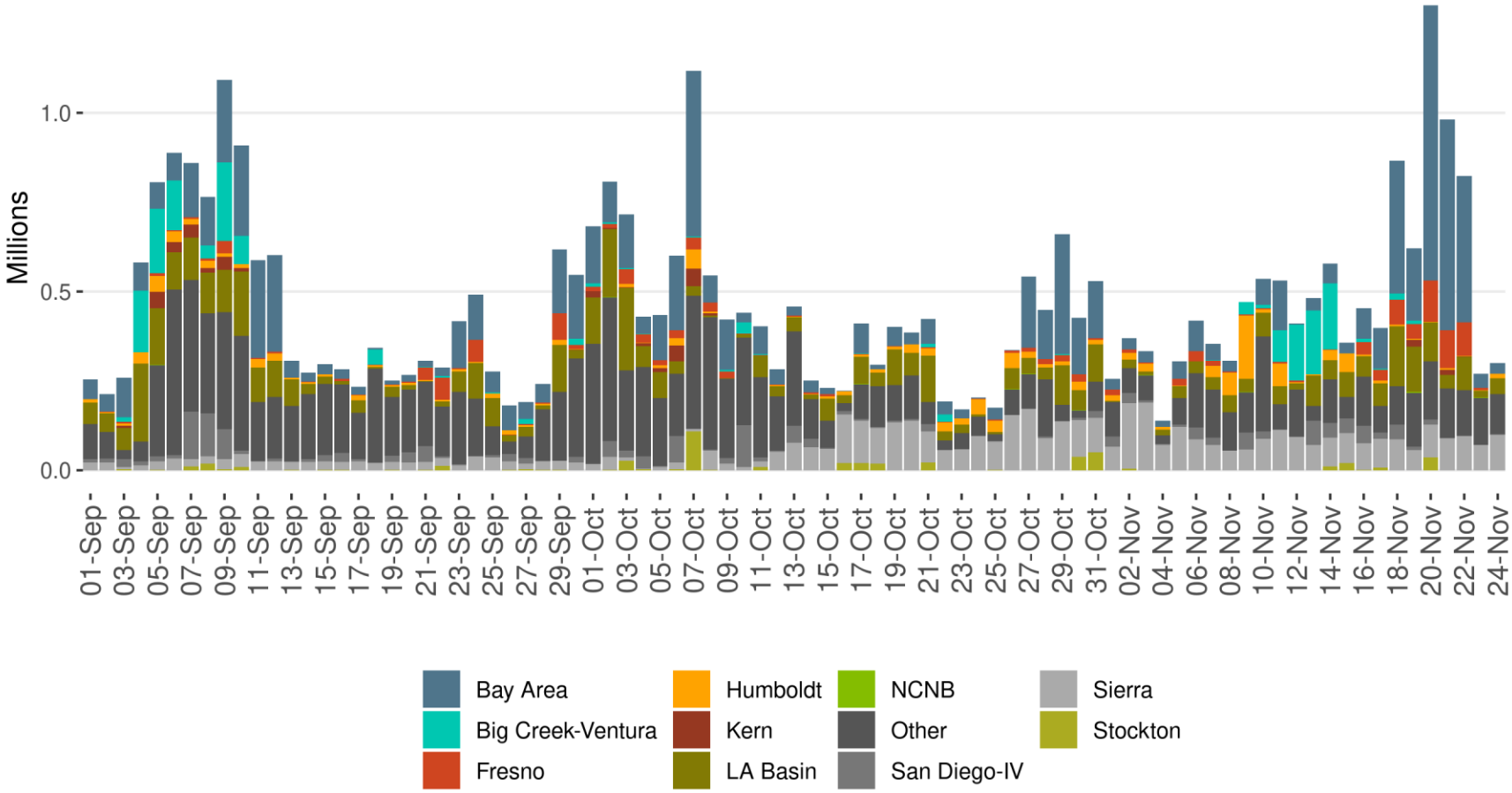
Exceptional dispatch volume in the ISO area remained low



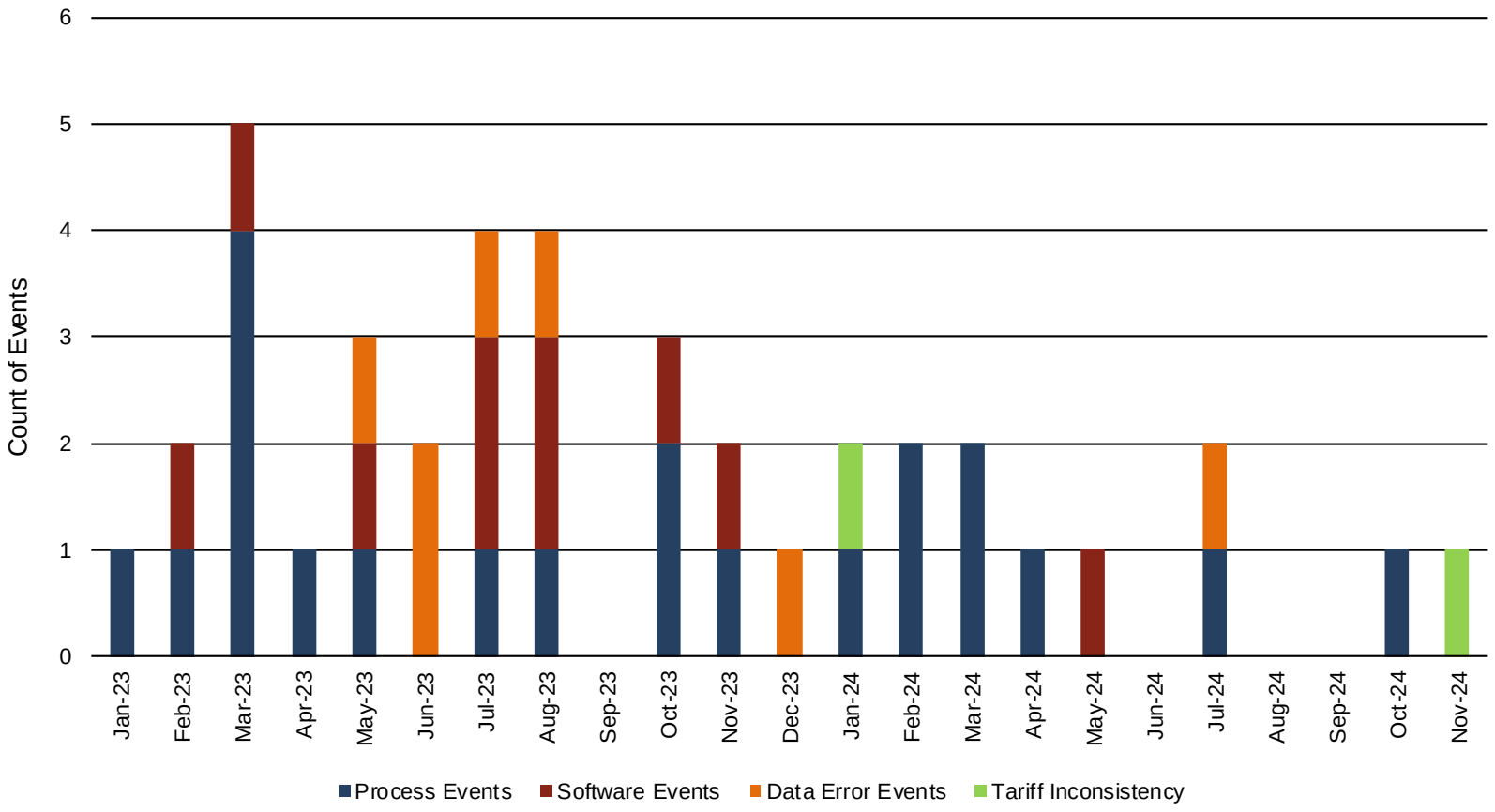
Exceptional dispatches volume driven by a variety of reasons



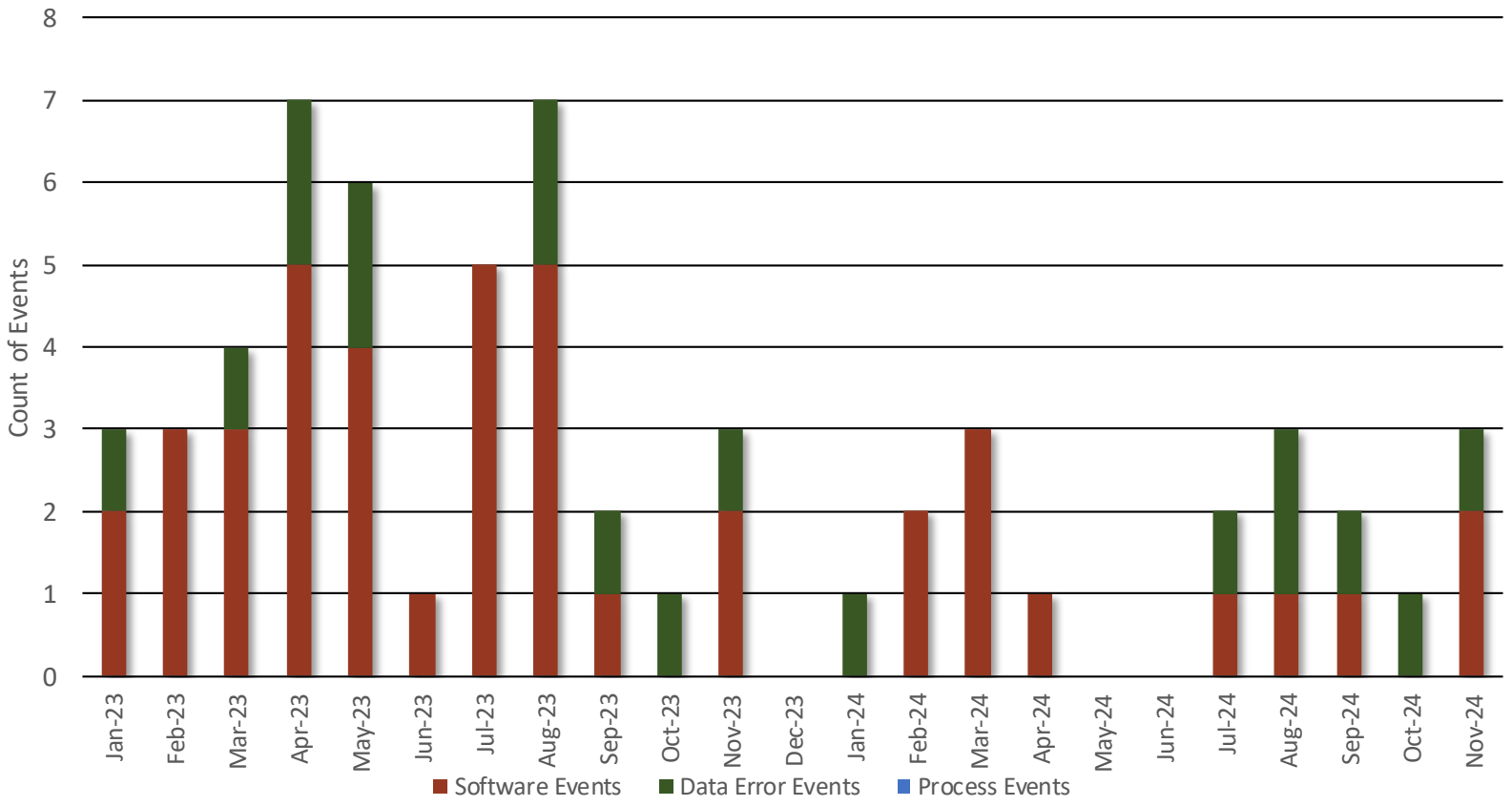
Bid cost recovery (BCR) by Local Capacity Requirement area



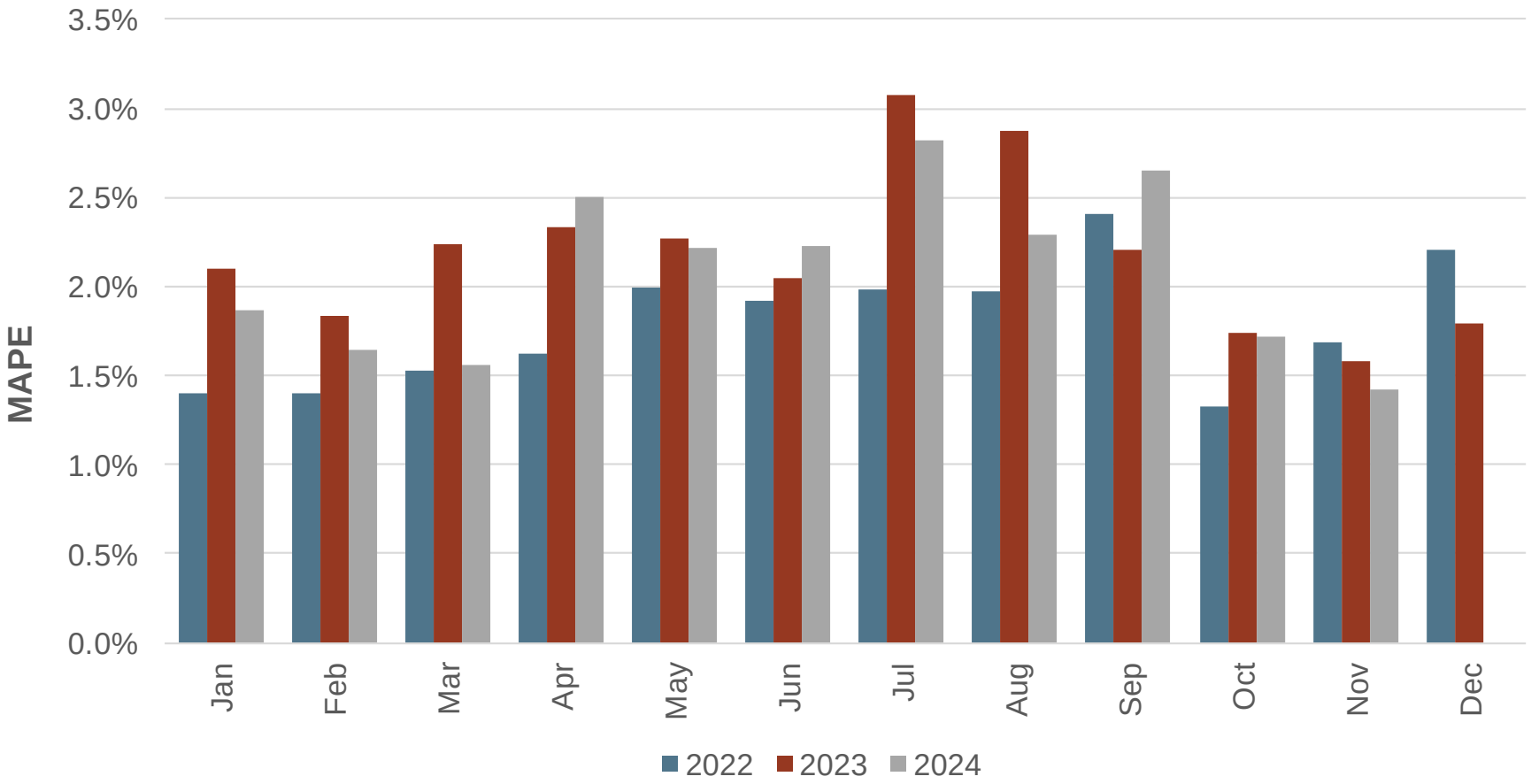
CAISO price correction events remain low



EIM-related price corrections remain low

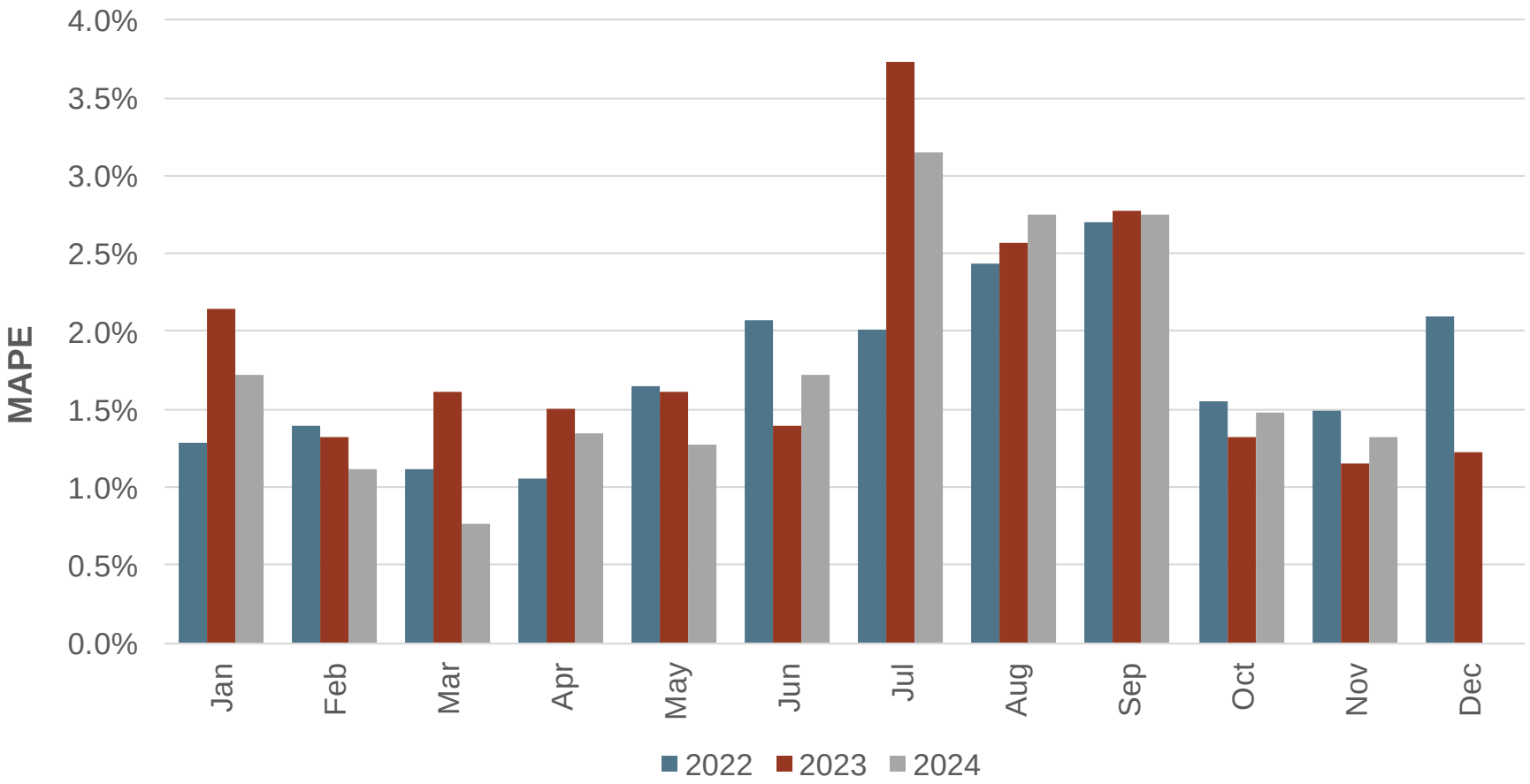


Day-ahead load forecast



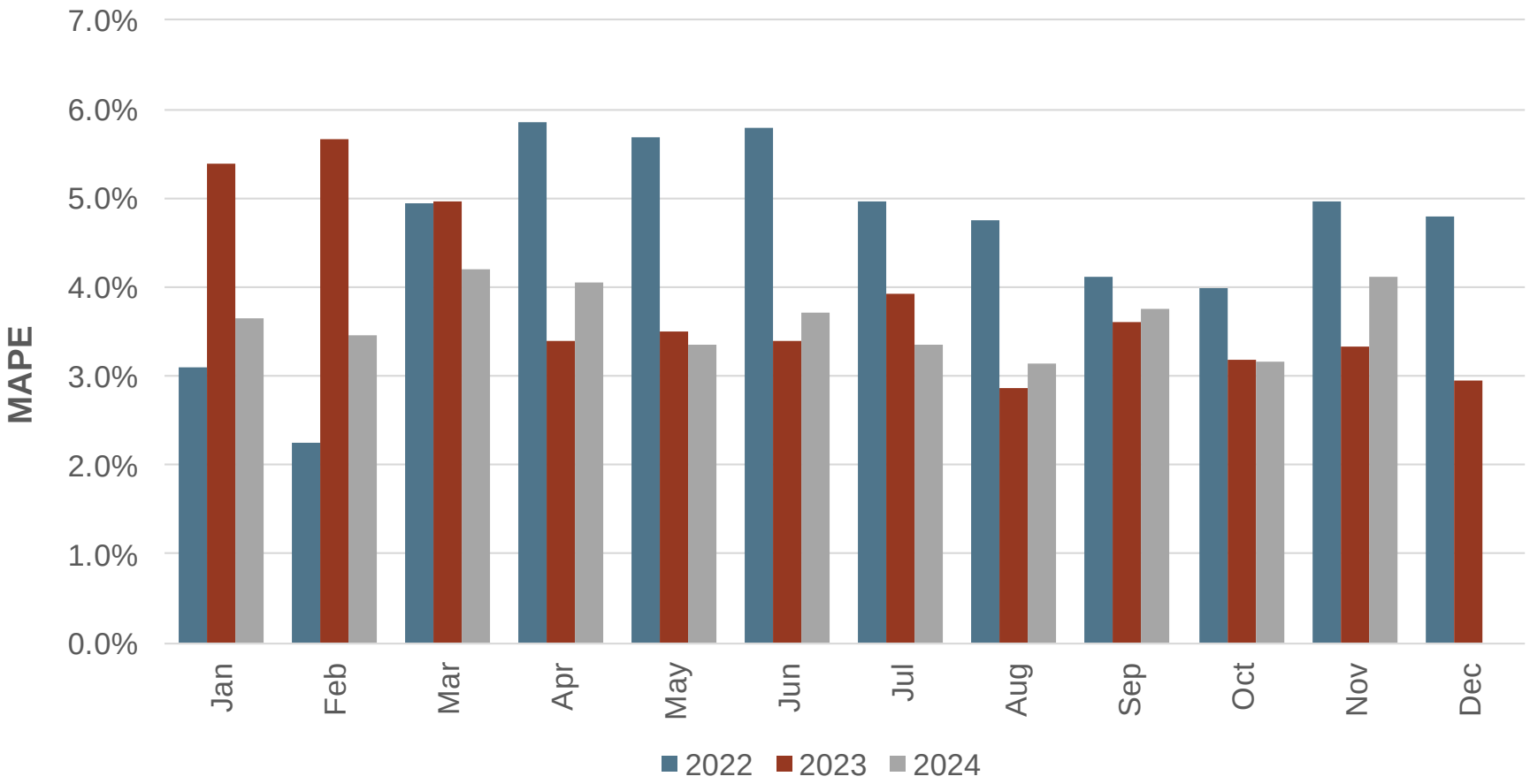
*MAPE = abs(Forecast – Actual)/Actual

Day-ahead peak forecast



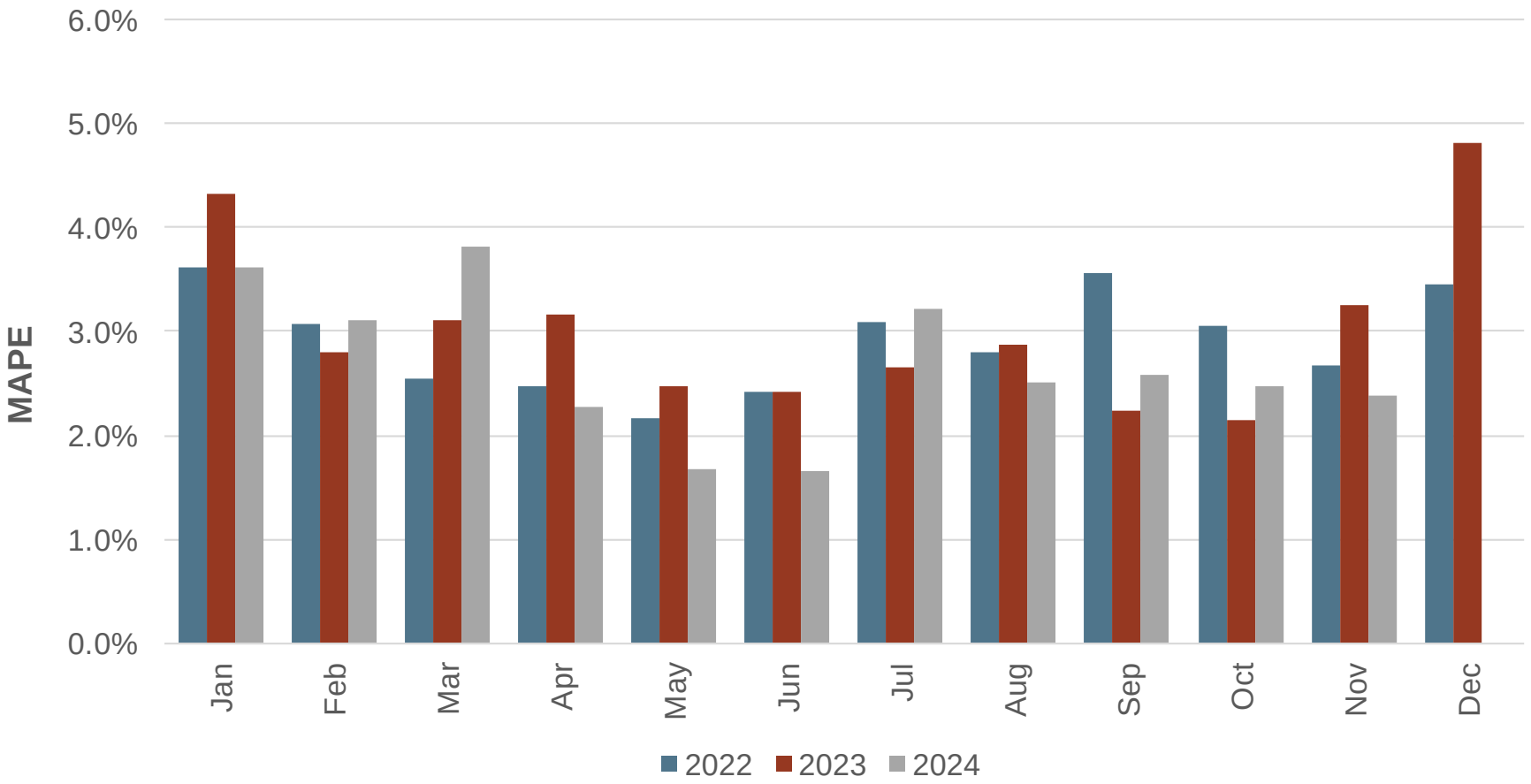
*MAPE = abs(Forecast – Actual)/Actual

Day-ahead wind forecast



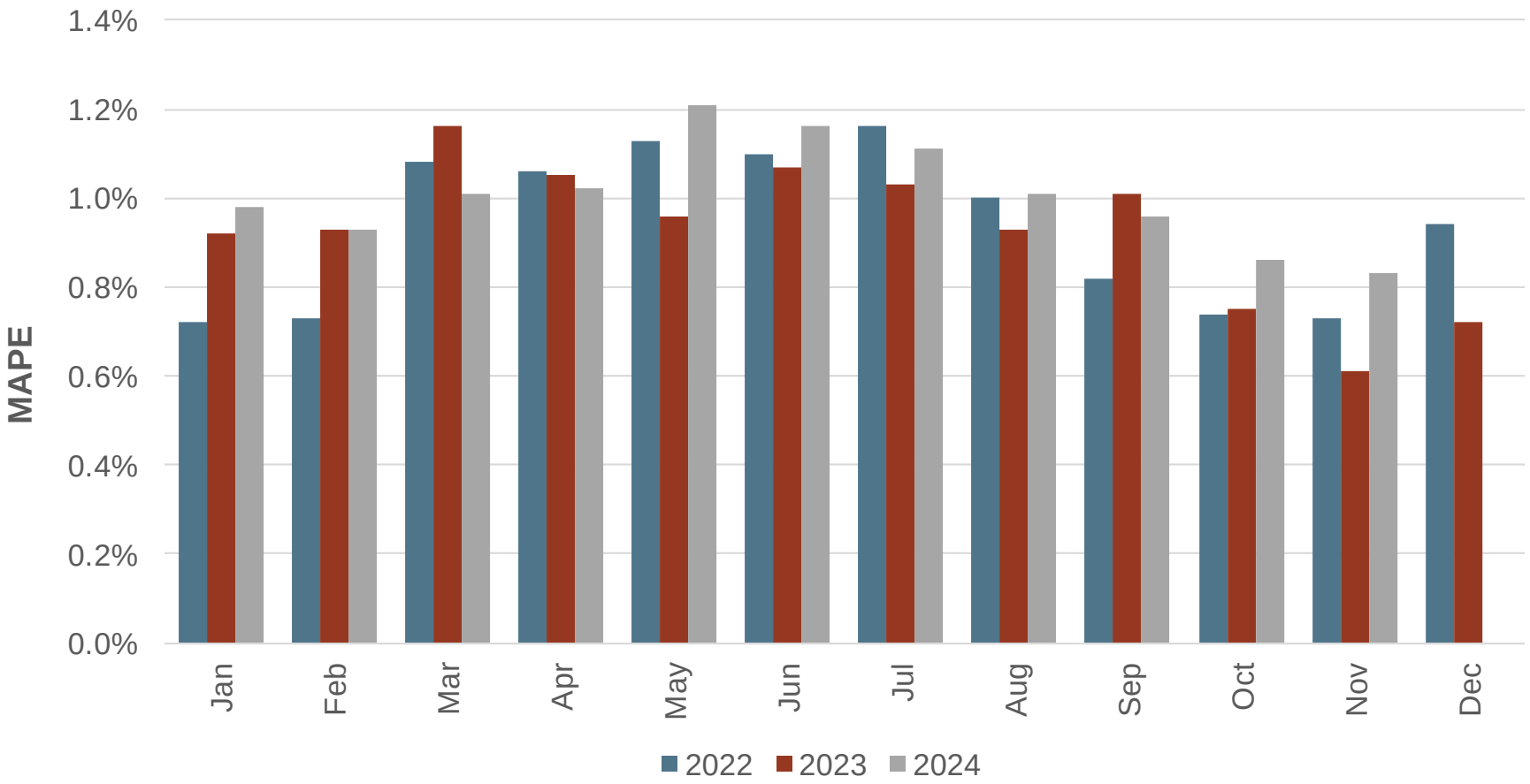
*MAPE = abs(Forecast – Actual)/Actual

Day-ahead solar forecast



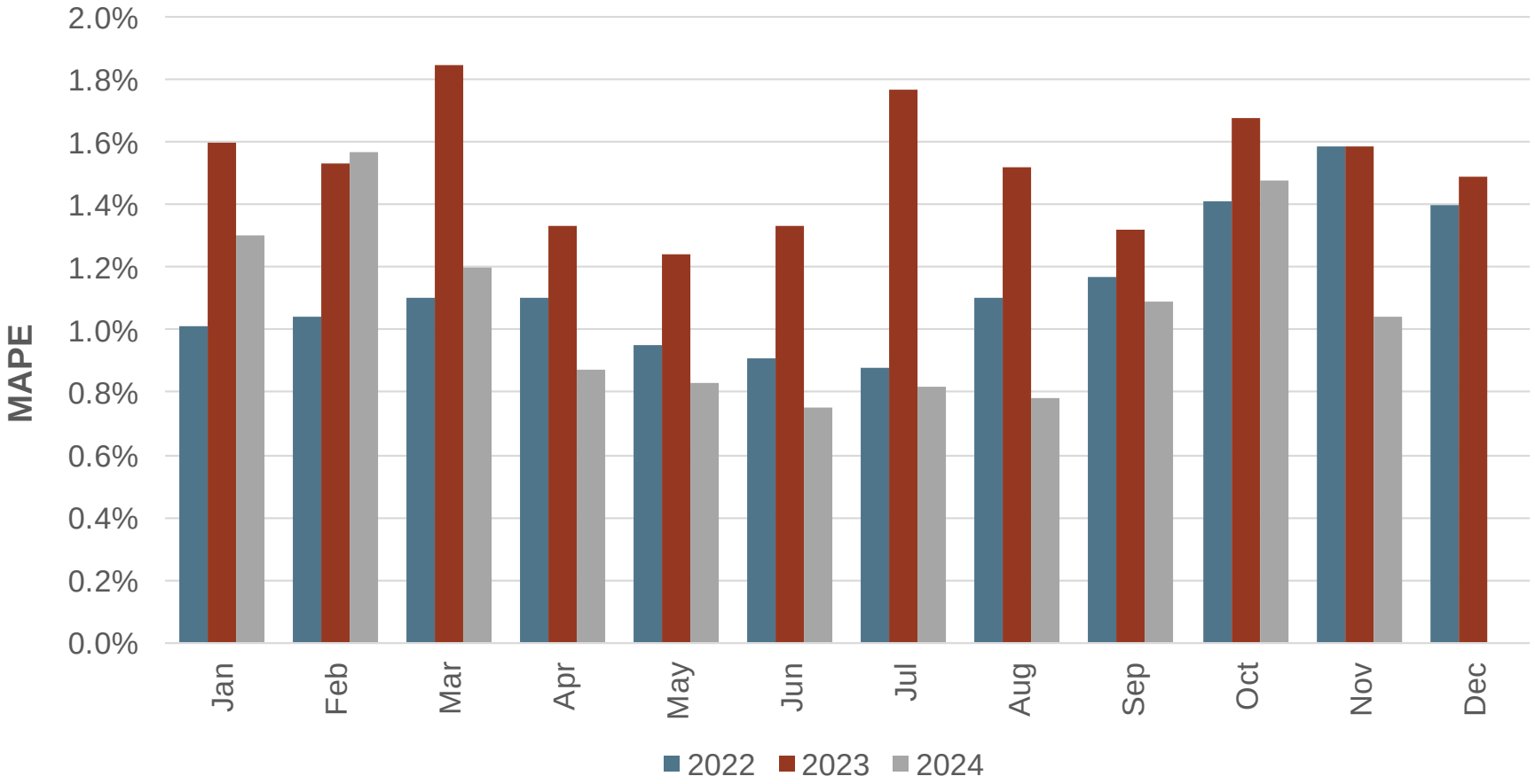
*MAPE = abs(Forecast – Actual)/Actual
**MAPE only calculated for intervals where Forecast > 0

Real-time wind forecast



*MAPE = abs(Forecast – Actual)/Actual

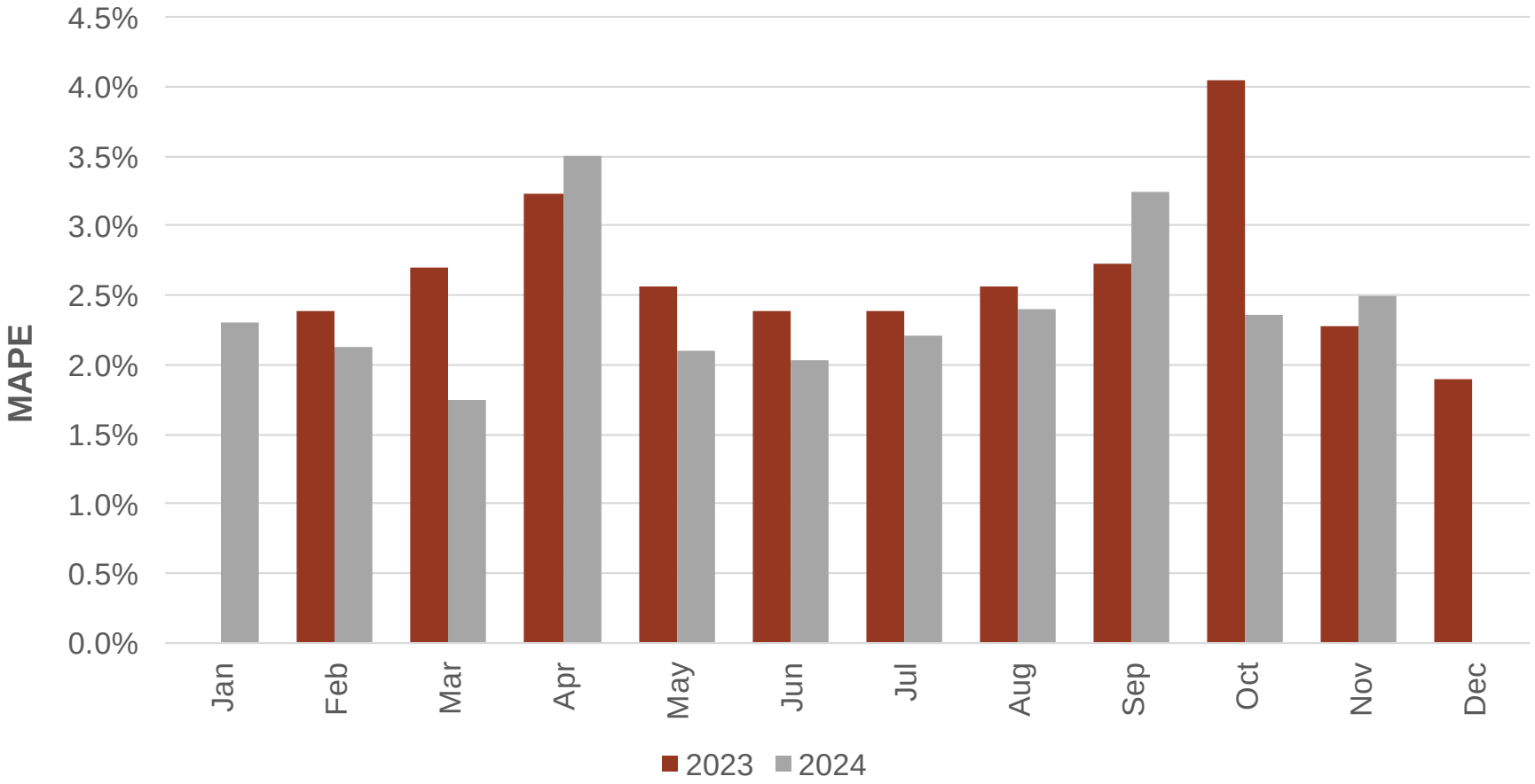
Real-time solar forecast



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

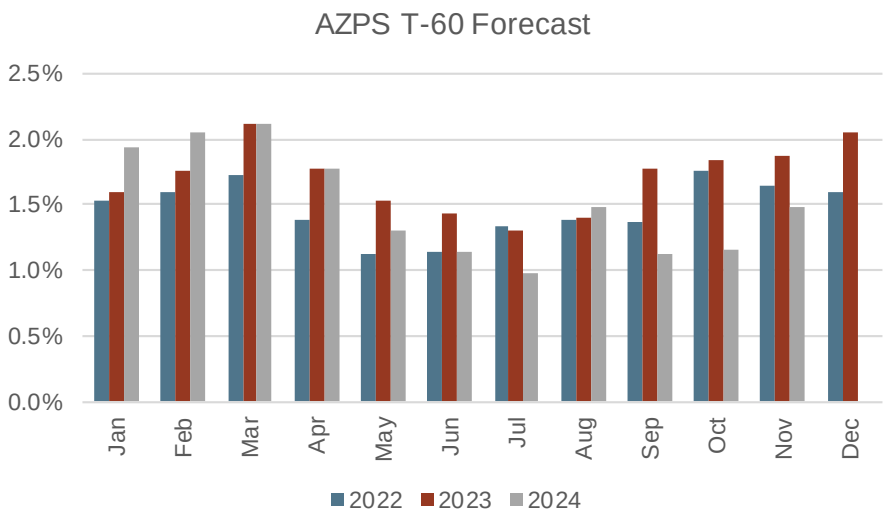
Real Time Solar Hybrid Performance

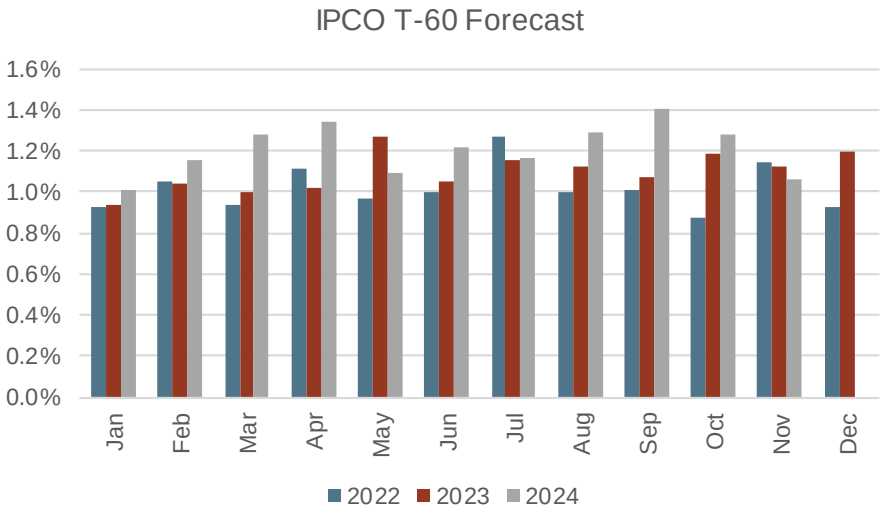
*Comparison of DOT to MW Production

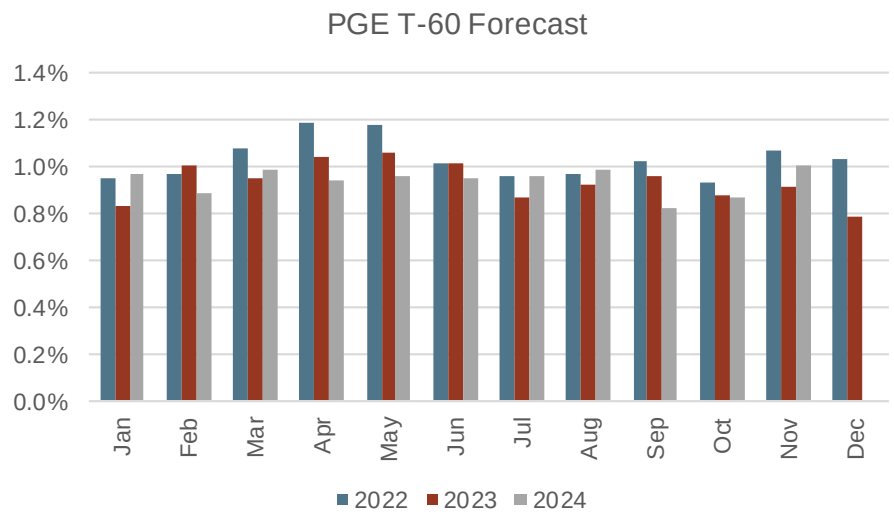


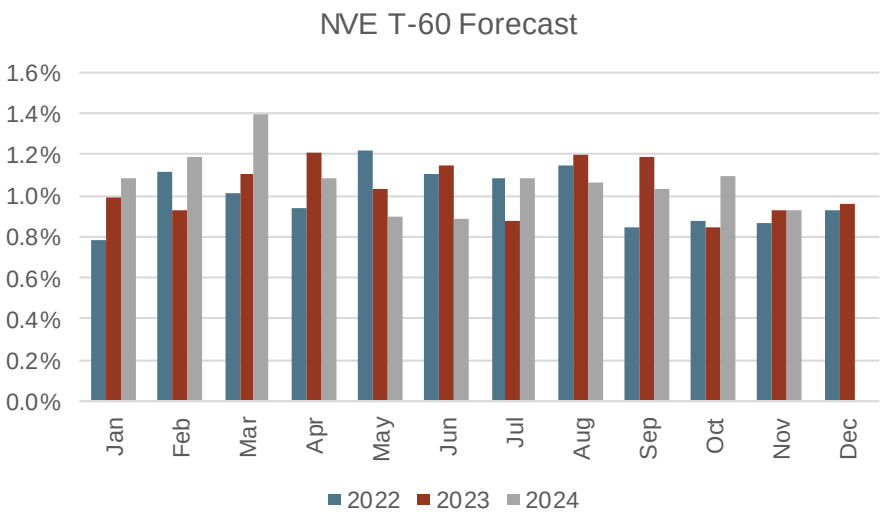
*MAPE = abs(DOT – Actual)/Capacity

EIM T-60 forecast

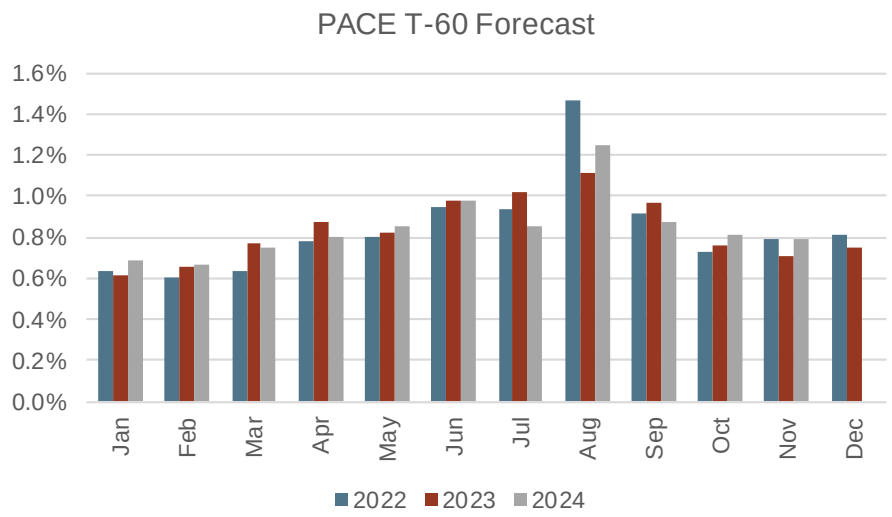


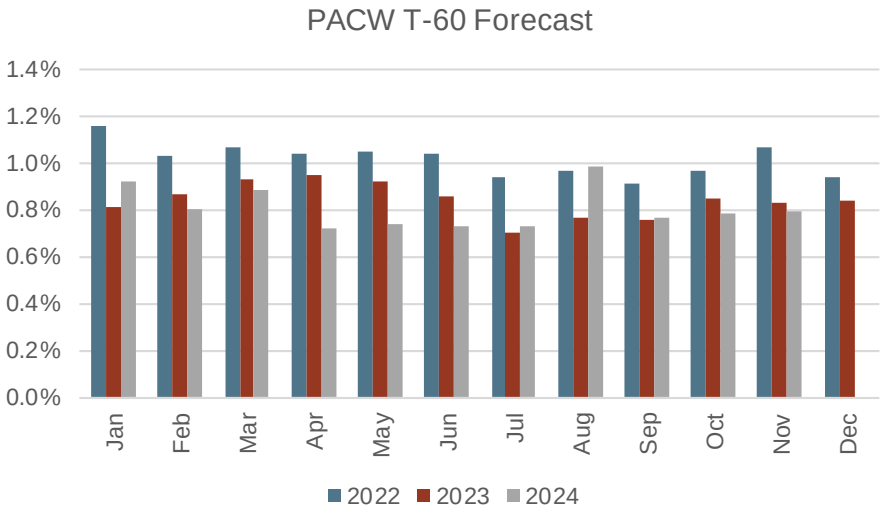


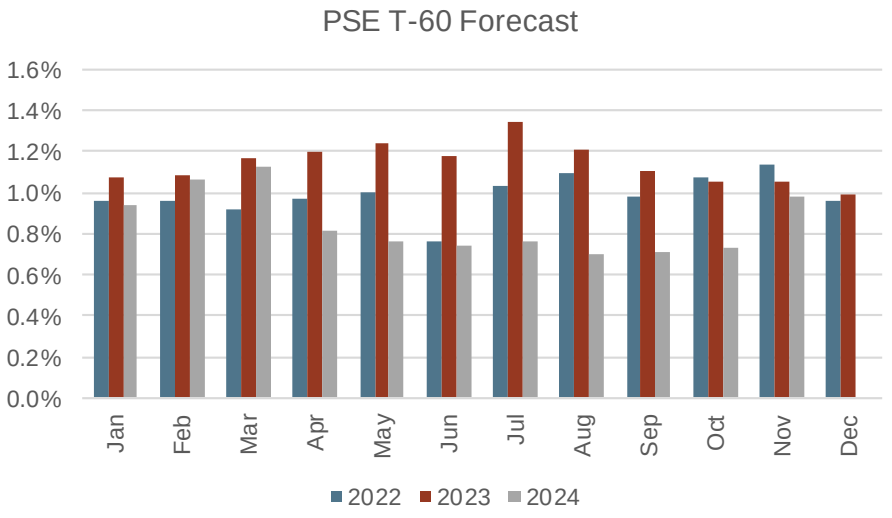


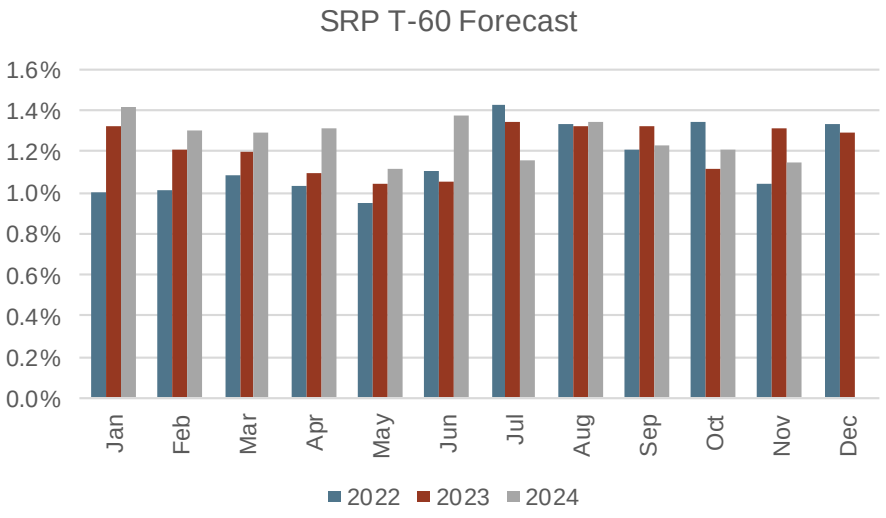


EIM T-60 forecast

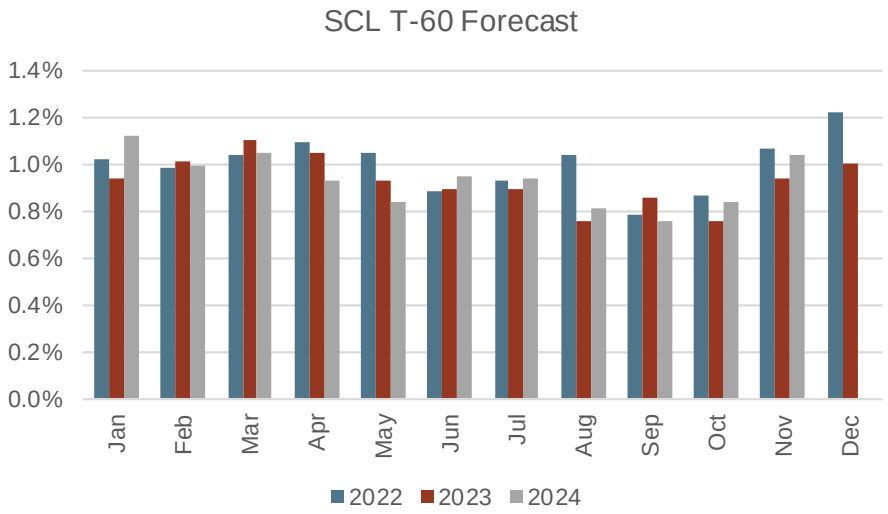


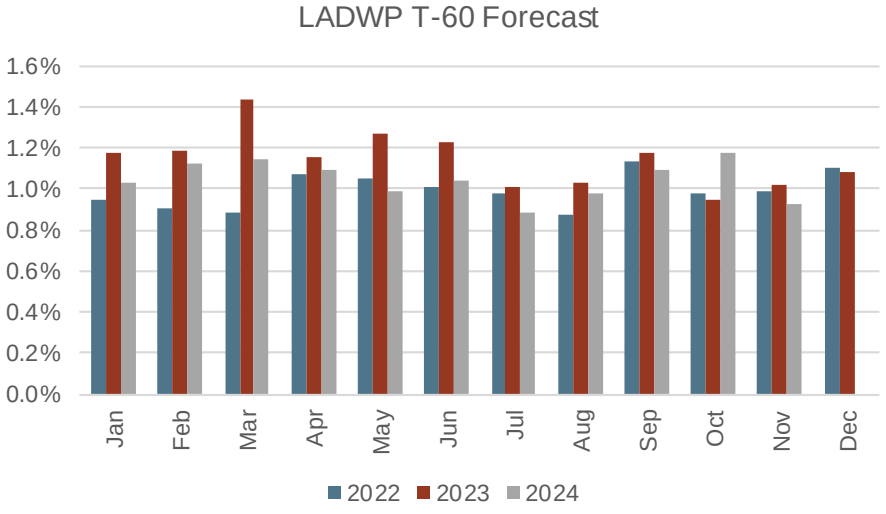


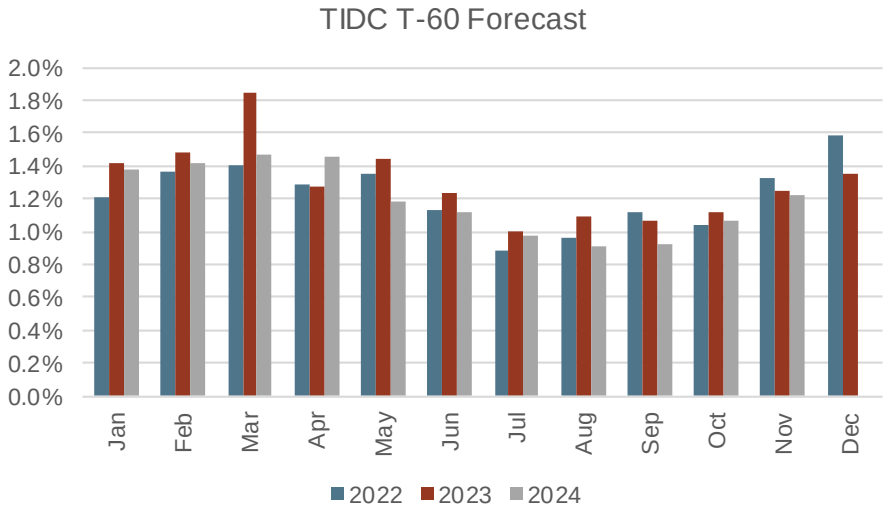


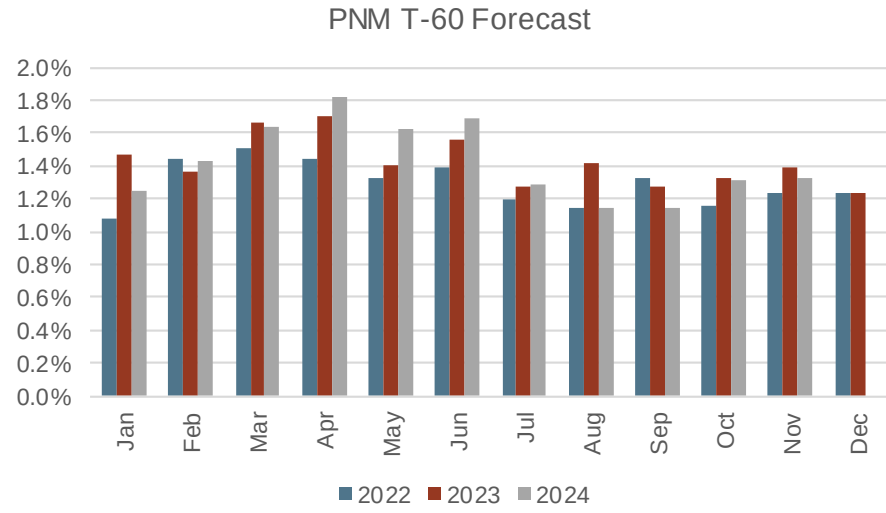


EIM T-60 forecast

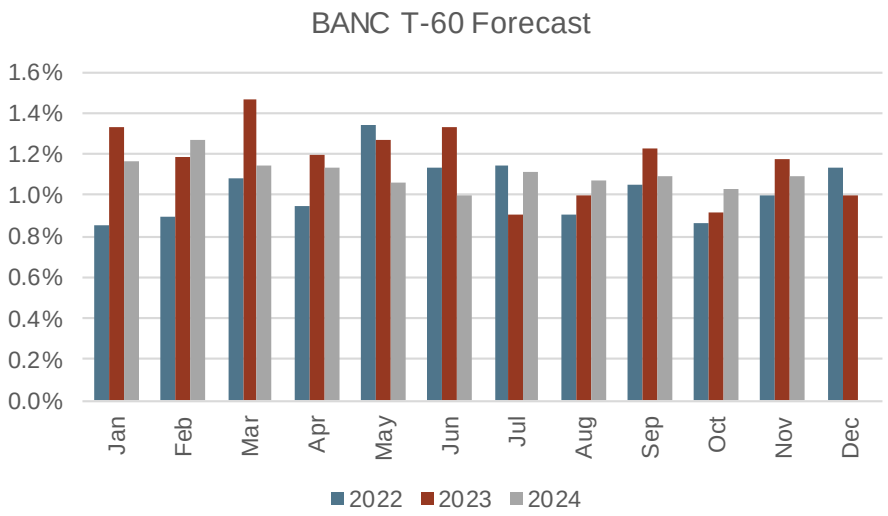


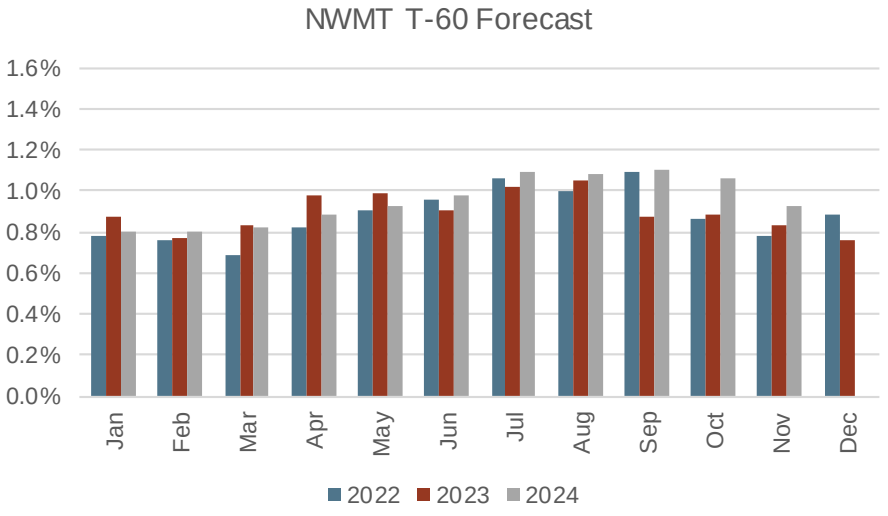


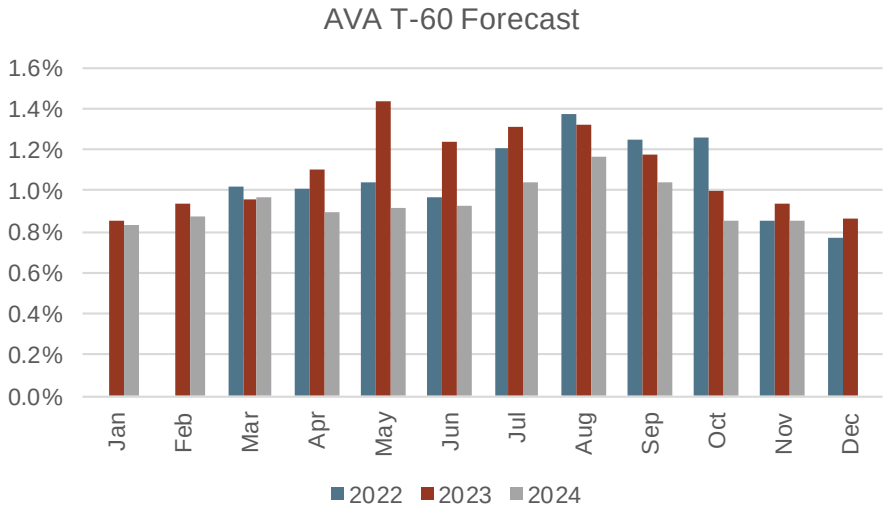


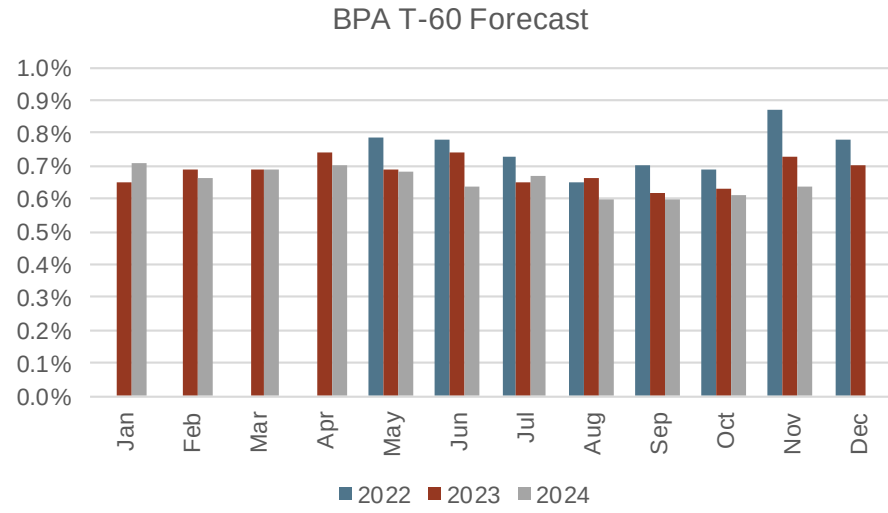


EIM T-60 forecast

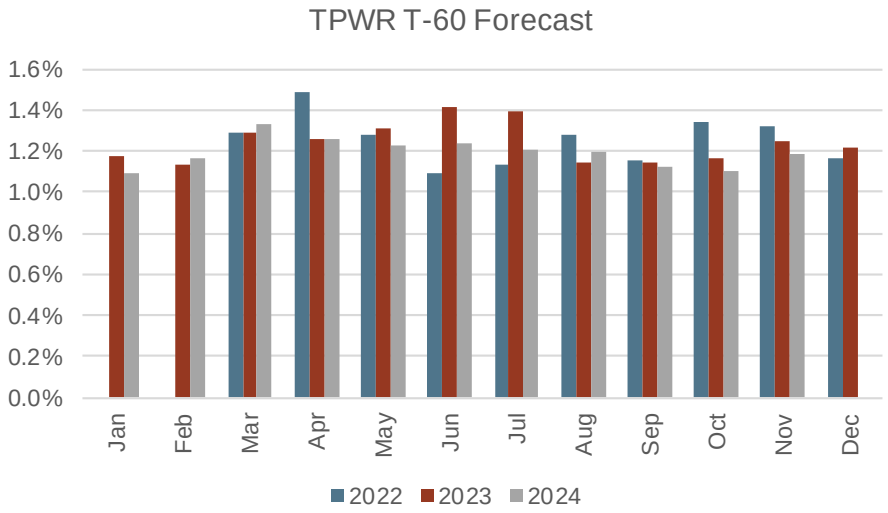


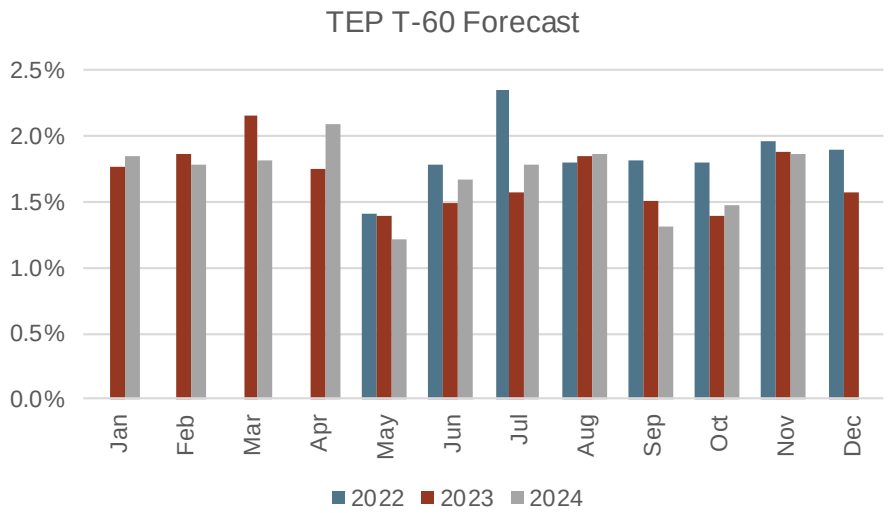




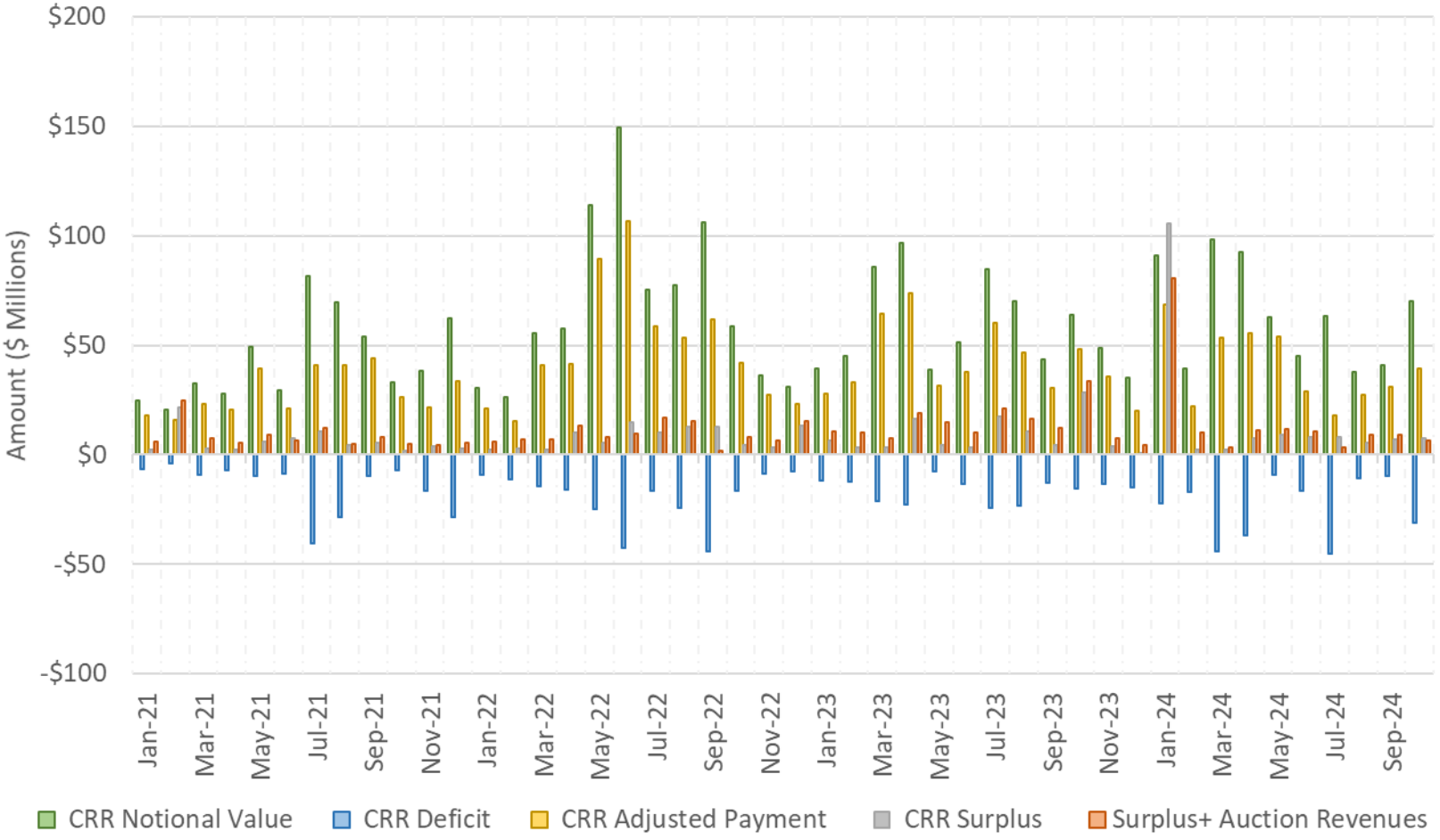


EIM T-60 forecast

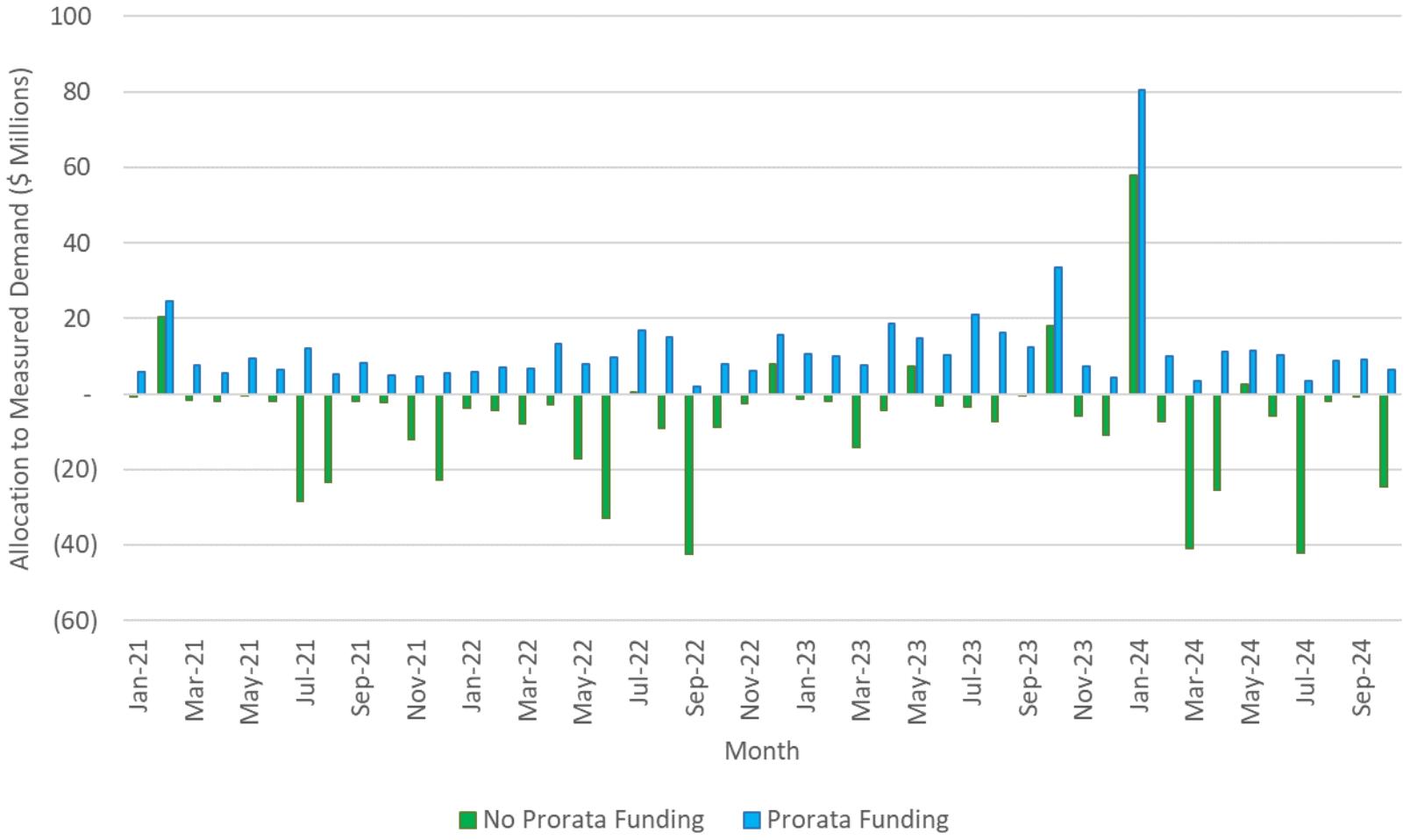




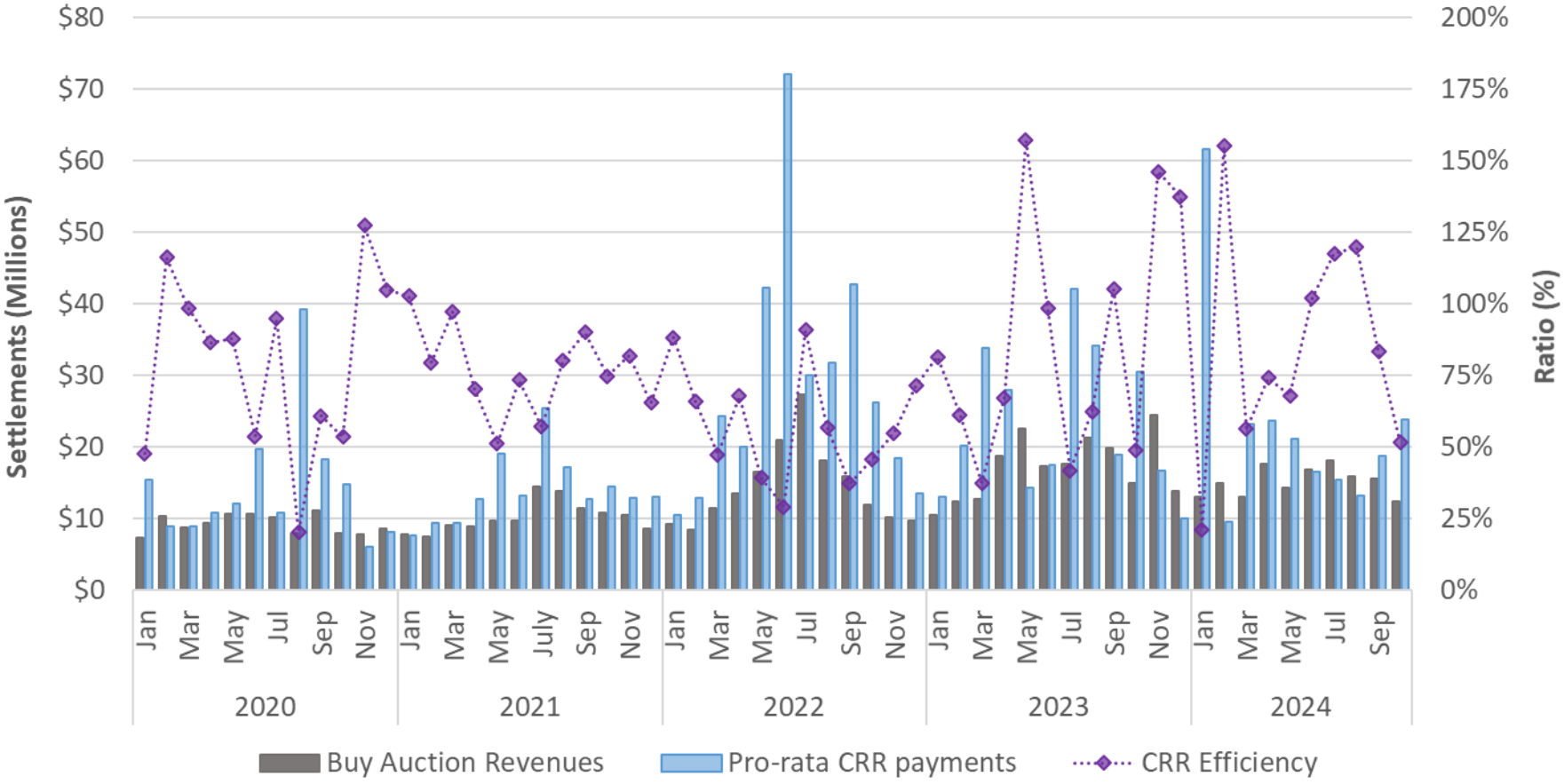
The overall CRR settlements continues to change base don congestion conditions



Pro-rata funding has neutralize significant level of revenue inadequacy in recent months



Auction efficiency has been fairly variable based on level of congestion observed



Policy Update

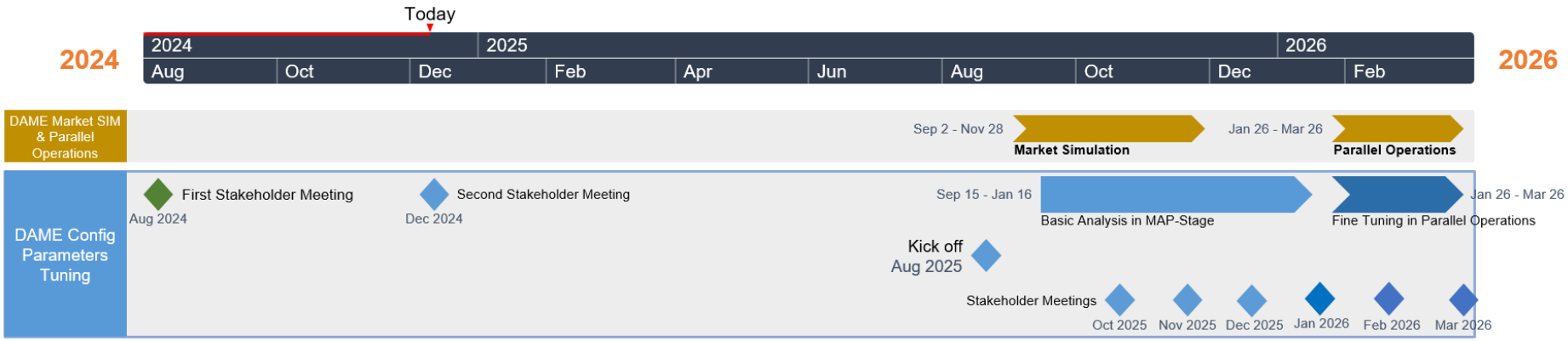
Becky Robinson
Director, Market Policy Development

Extended Day Ahead Market (EDAM) & Day Ahead Market Enhancements (DAME)

- EDAM tariff has been fully approved by FERC and currently engaging in implementation activities.

- In July, we outlined the DAME testing timeline, testing approach, and expectations for communications and engagement with stakeholders.
  - This served as a first step toward our commitment to convene implementation working groups to test and refine specific "tunable parameters."
  - Stakeholders submitted comments on September 4 and requested earlier meetings than originally planned. As a result, we will hold a kickoff meeting in August 2025, followed by monthly working group sessions beginning in October 2025 to coincide with the market simulation launch.

DAME Implementation Working Group Schedule



WEIM Resource Sufficiency Evaluation Enhancements (RSEE)

- Q1 2025 kick-off for RSEE Phase 3 working groups
  - Enhance and/or reauthorize existing AET design prior to December 2025 expiration
  - Improvements to increase RSE usability
- Scope informed by analysis of recent summer and winter activity
- Proposed Decisional Classification: Joint Authority

Price Formation Enhancements working groups

- The PFE working group launched Phase 2 on November 6, 2024.
  - Its goal is to develop specific policy proposals and market design solutions, using the insights and stakeholder feedback gathered in Phase 1.
  - Separate straw proposals for scarcity pricing/BAA MPM and fast-start pricing expected in May 2025.
  - Working groups are meeting **weekly** (excluding Holidays).
  - The working group has begun substantive discussions on potential frameworks and implementation methods for fast-start pricing and MPM.
  - First scarcity pricing discussion on December 16, 2024.

Greenhouse Gas Coordination (GHG) working group

- GHG accounting for state policies without a price on carbon emissions
  - Moving forward to design policy on an out-of-market GHG "accounting and reporting" approach, introduced and supported by stakeholders
  - Issue paper to be published mid-December and continue design discussions in upcoming working group meetings
- GHG information and metrics
  - Heard stakeholder requests for additional GHG metrics and information to help support compliance with different state programs
    - The ISO started publishing average GHG emissions rate monthly and annual reports
    - Additional metrics reports will become available through the accounting and reporting approach
    - Finalizing GHG metrics that will be monitored with EDAM launch
- Continued review of GHG design
  - Ongoing review of GHG design in the WEIM and EDAM

Gas Resource Management working groups

- Stakeholders identified problem statements, and potential solutions, associated with three main issue areas:
  - Increasing certainty for advance fuel procurement,
  - Precision of gas market inputs used for electricity market operations, and
  - Facilitation of resource-specific cost adjustments.
- Published a working group discussion paper with stakeholder recommendations for policy development in May 2024.
- Planning to publish an issue paper in December 2024

Storage Bid Cost Recovery and Default Energy Bid Enhancements

- Current BCR construct does not adequately consider state of charge (SOC), which is necessary for storage resources to support awards and schedules, creating two concerns:
  - Concern 1: Storage assets are not exposed to real-time prices for deviating from day-ahead schedules
  - Concern 2: Storage assets may have an inventive to bid strategically to maximize the combined BCR and market payments
- On November 26th the ISO filed a tariff amendment before FERC to modify the RT BCR rules for storage resources in order to address Concern 2 (strategic bidding)
  - The modification is based on a solution put forth by stakeholders and developed over several months of robust engagement
- Policy efforts on Concern 1 and other storage matters will continue under the Storage Design & Modeling initiative, which will kick off December 11th

Congestion Revenue Rights working groups

- This initiative builds off CAISO's 2019 efforts to enhance the Congestion Revenue Rights (CRR) market.
- Based on stakeholder prioritization and internal analysis, this initiative will explore a variety of stakeholder concerns related to auction efficiency, revenue inadequacy, product definition, and allocation
- CAISO kicked off working groups with a November 14th Working Group meeting. We plan to have a series of working group meetings focused on education and analysis to ultimately refine the Draft problem statements below.

Draft Problem Statement 1: Auction Efficiency

- The ISO CRR auction has been yielding only roughly 65 cents per dollar of congestion revenue
- As such, auction prices are not reflecting market participants' congestion price exposure

Draft Problem Statement 2: Revenue Inadequacy

- Pro-ration of CRRs hinders the ability for CRRs to be an effective risk mitigation tool
- Pro-rated funding may result in settlements reversal adding to the participant risk

Draft Problem Statement 3: Limited Allocation

- The ISO's application of a Global Derate Factor reduces LSEs' ability to adequately hedge congestion

Draft Problem Statement 4: Product Definition

- The ISO's current counter-flow CRR allocation process and On/Off Peak definitions adversely impact hedging of congestion risks.

Resource Adequacy (RA) working group

The working group moved topics to the policy phase and published an *Issue Paper* in mid-November (Tracks 1-3). Remaining items will be discussed at a future working group meeting in 2025.

Track 1: Modeling & Default Standards

- LOLE Modeling
- Default PRM and default counting
- UCAP for default counting, in collaboration with the CPUC and other LRAs
- Incorporating ambient derates due to temperature

Track 2: Outage and Substitution & Availability and Performance Incentives

- Updating the ISO's outage and substitution processes
- Reforming availability and performance incentives

Track 3: Backstop Reform

- Increase the ISO's visibility into available backstop capacity
- Increase transparency to stakeholders on backstop decision making
- Updating the current backstop product
- Longer-term solutions for the ISO BAA around curing deficiencies and assigning costs related to the EDAM RSE

Continued Working Group Topics

- Requirements for RA capacity (energy sufficiency, Flex RA)
- Deliverability
- Continual assessment of interoperability with existing and emerging RA programs

Policy Initiatives Catalog & Roadmap

- 2024 Final Policy Roadmap being released this month
  - Work plan for 2025-2027
  - Three new policy initiatives beginning with scoping working groups in Q1 2025:
    - Congestion Revenue Rights
    - Demand Response, Distributed Energy Resources, Biddable/Participating Demand
    - Storage Design and Modeling
- 2025 Catalog & Roadmap development begins January with stakeholder submissions of policy initiative proposals

2025 Policy Initiative Work Plan: Existing Initiatives

		2025			
		Q1	Q2	Q3	Q4
Day Ahead Market Enhancements (DAME)				Implementation working groups	
Extended Day Ahead Market (EDAM)		Implementation			
Gas Resource Management		Proposal working groups	Policy development		Decision
Greenhouse Gas Coordination					
	Topic 1: WEIM/EDAM GHG design	Scoping working groups			
	Topic 2: Non-priced approaches for GHG reduction	Policy development	Decision		
	Topic 3: Additional GHG-related metrics	Scoping working groups			
Penalty Enhancements: Demand Response, Investigation, and Tolling		Implementation			
Price Formation Enhancements					
	Scarcity pricing & market power mitigation	Proposal working groups	Straw proposal	Policy development	
	Fast start pricing	Proposal working groups	Straw proposal	Policy development	

Pre-proposal development
Proposal development
Decision
Implementation

2025 Policy Initiative Work Plan: Existing Initiatives (cont.)

		Q1	Q2	Q3	Q4
Resource Adequacy Modeling and Program Design					
	Track 1: Modeling, Defaults, and Accreditation	**Policy development**		**Decision (Default Counting Rules/PRM)**	**Implementation (Default Counting Rules/PRM)**
	Track 2: Outage & substitution and availability and incentive mechanisms	**Policy development**		**Decision**	
	Track 3a: Backstop reform and long-term EDAM RSE solutions	**Policy development**			
	Track 3b: RA status visibility	**Policy development**		**Decision**	**Implementation**
Storage Bid Cost Recovery and Default Energy Bid Enhancements		**Phase I Implementation**			
WEIM Resource Sufficiency Evaluation Enhancements		**Policy development**			

Pre-proposal development
Proposal development
Decision
Implementation

2025 Policy Initiative Work Plan: New Initiatives

		Q1	Q2	Q3	Q4
Congestion Revenue Rights		**Scoping working groups**	**Policy development**		
Demand Response, Distributed Energy Resources, Biddable/participating demand					
	Phase I	**Scoping working groups**			**Policy Development**
	Phase II				**Scoping working groups**
Storage Design and Modeling		**Scoping working groups** **Issue paper**		**Policy development**	

Pre-proposal development
Proposal development
Decision
Implementation

Release Plan Update

Trang Vo

Release Manager,

Project Management

Please join the next Release User Group on Thursday, December 19 at 1500 PT for the Release Plan Update

The Release Plan Update will return to the next MPPF

Customer Partnership Group for Congestion Revenue Rights upgrade project call on 12/19/24

- The California ISO has scheduled a Customer Partnership Group (CPG) for the Congestion Revenue Rights (CRR) System upgrade project meeting on Dec. 19, 2024, to review the production cutover schedule, market simulation checklist, project timeline schedule, and training update. A new time for this meeting only is set at 1 p.m. Pacific Time.

  A presentation will be available prior to call on the Customer Partnership Groups webpage.

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

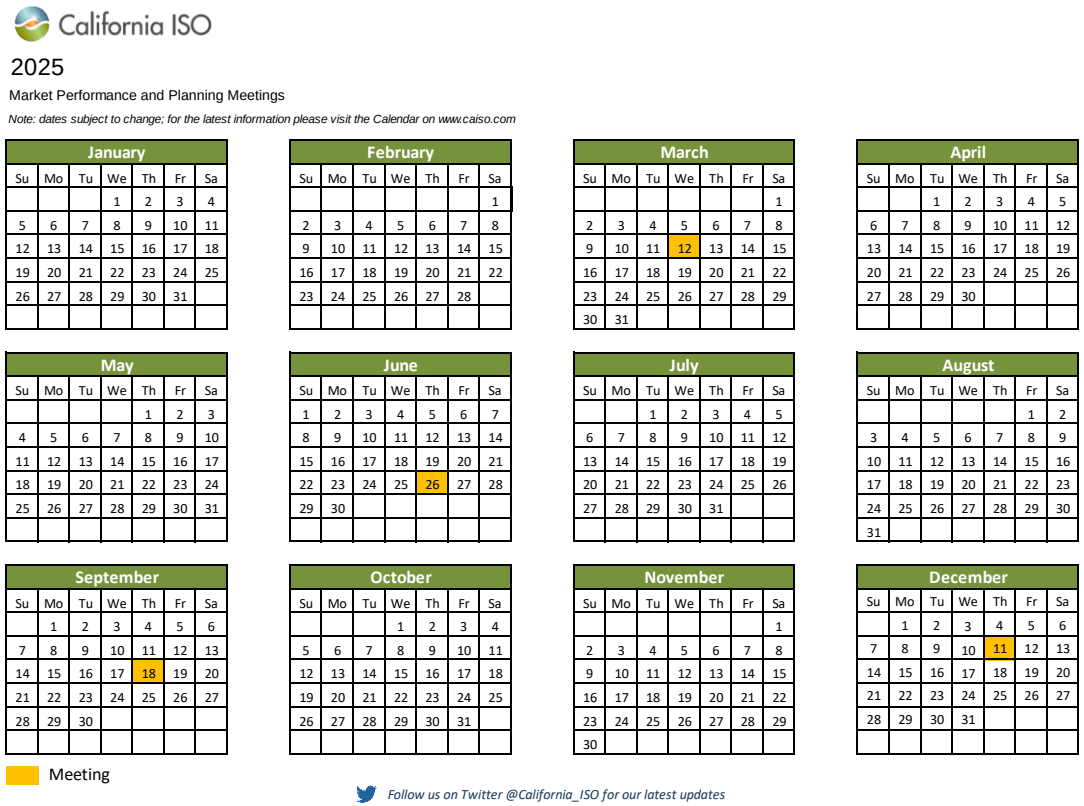
2024 Annual Policy Initiatives Roadmap: Final Policy Initiatives Roadmap and dispositions of submitted initiatives posted

- The California ISO has published the 2024 Final Policy Initiatives Roadmap and dispositions of submitted initiatives to its website. The Roadmap document describes the updated process that the ISO undertook over the course of 2024 to solicit stakeholder submissions, facilitate discourse among stakeholders about their submissions, consider stakeholder prioritization, and incorporate that feedback into the ISO's final policy initiative work plan for 2025-2027. The document also includes dispositions, or outcomes of the ISO's prioritization process, for stakeholder submissions to the Catalog. These dispositions describe why or why not the ISO was able to incorporate each submission into the Roadmap or other ISO planning process.
- Information related to the 2024 Annual Policy Initiatives Roadmap Process is available on the process webpage.

Next Forum

Upcoming MPPF meeting

The next MPPF is tentatively scheduled for March 12, 2025. https://www.caiso.com/meetings-events/topics/market-performance-and-planning-forum



California ISO

2025

Market Performance and Planning Meetings

Note: dates subject to change; for the latest information please visit the Calendar on www.caiso.com

January

Su	Mo	Tu	We	Th	Fr	Sa
			1	2	3	4
5	6	7	8	9	10	11
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February

Su	Mo	Tu	We	Th	Fr	Sa
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April

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May

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25	26	27	28	29	30	31

June

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29	30					

July

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August

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September

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October

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November

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December

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28	29	30	31			

Meeting

Follow us on Twitter @California_ISO for our latest updates

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