



California ISO

Market Update

EDAM performance

Market Performance and Advanced Analytics

May 28, 2026

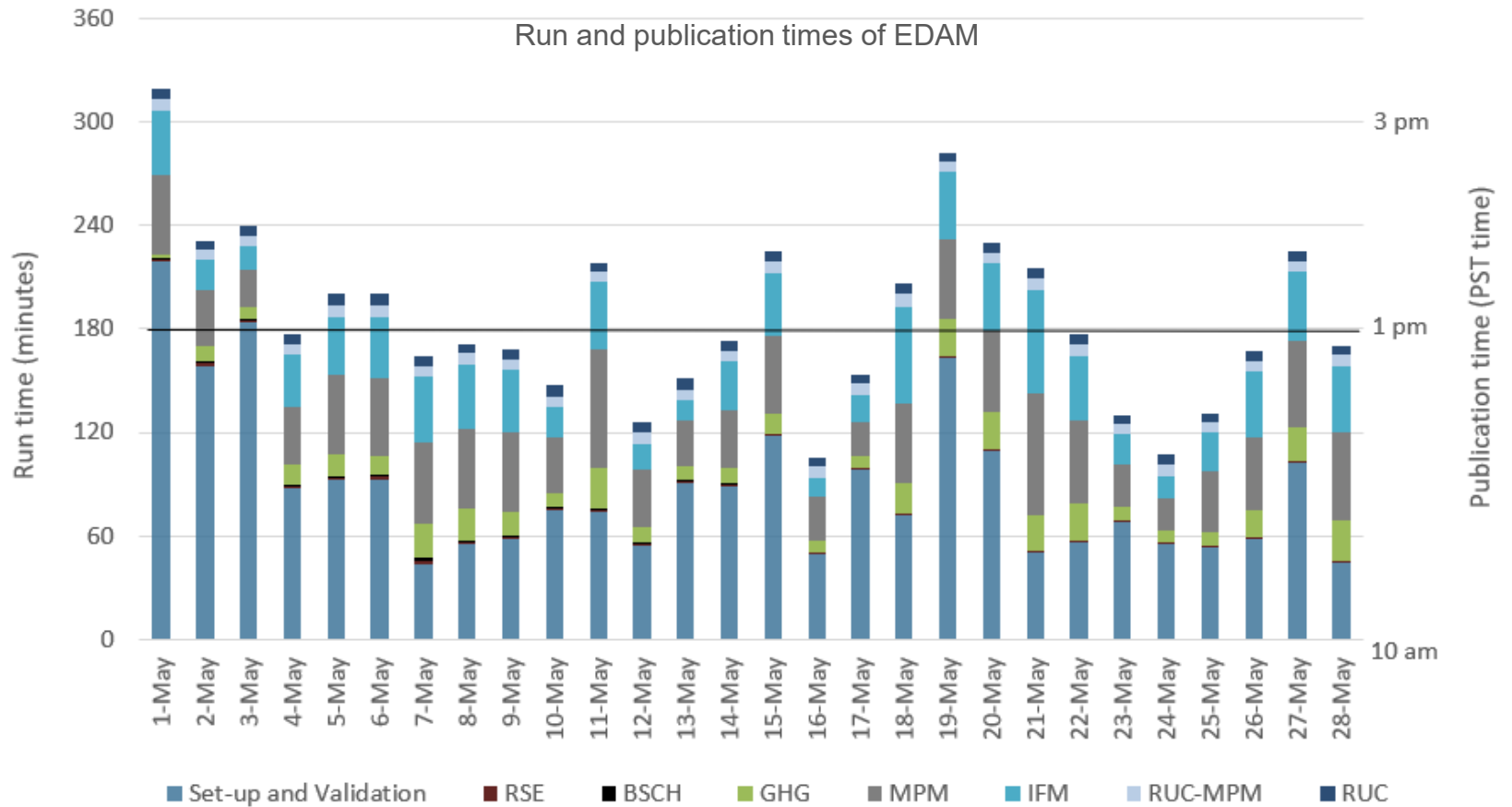
CAISO PUBLIC

Agenda

- EDAM performance
- Questions on EDAM market results
- Price corrections
- Next steps

EDAM performance

The ISO continues to closely reviewing and validating results with the goal to publish by the 1pm deadline

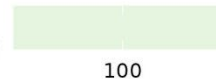


All three balancing areas have passed all Resource Sufficiency Evaluations since May 10th

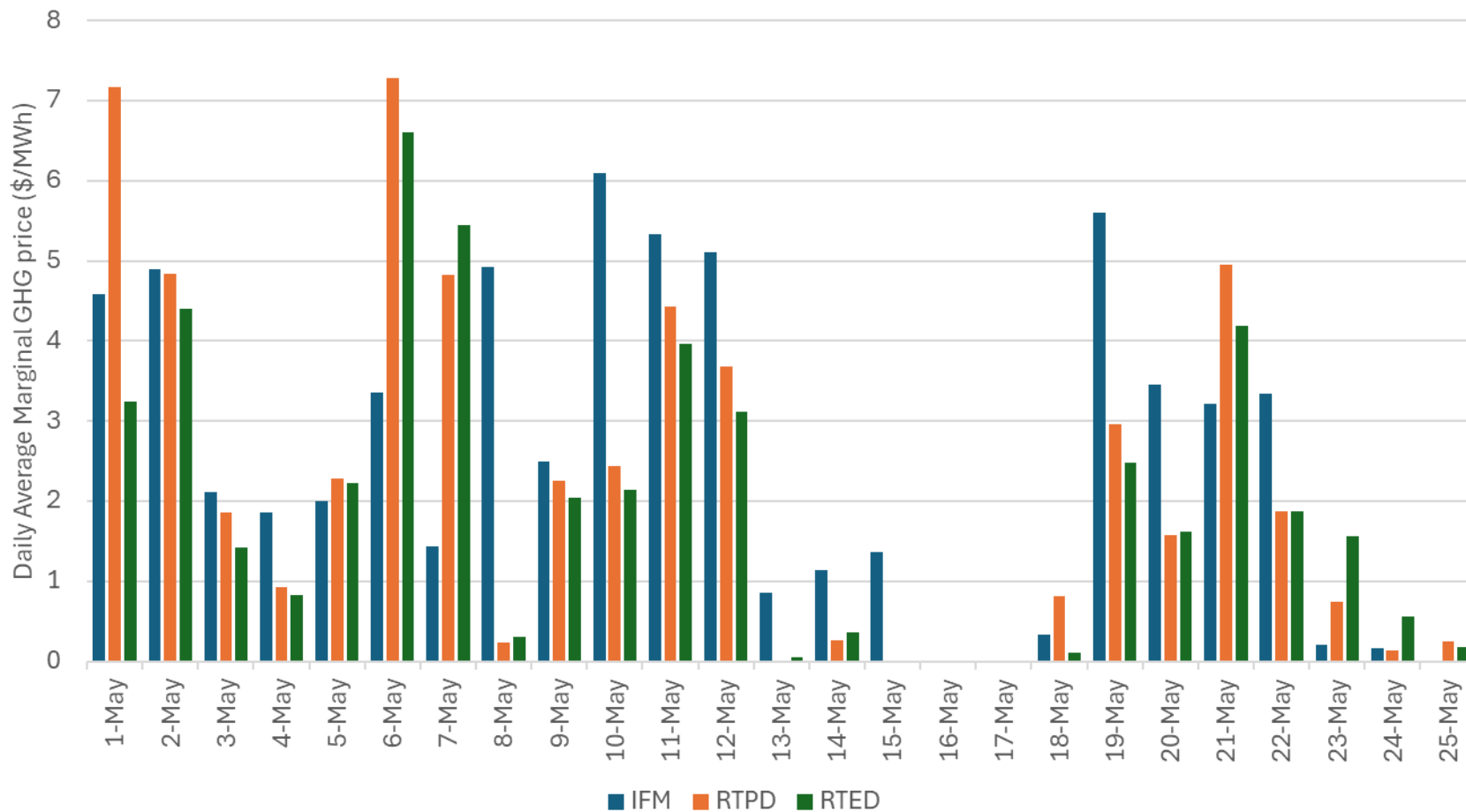
	05/10	05/11	05/12	05/13	05/14	05/15	05/16	05/17	05/18	05/19	05/20	05/21	05/22	05/23	05/24	05/25
PACW-lu	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
PACW-ld	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
PACE-lu	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
PACE-ld	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
CISO-lu	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
CISO-ld	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

BAA and Commodity

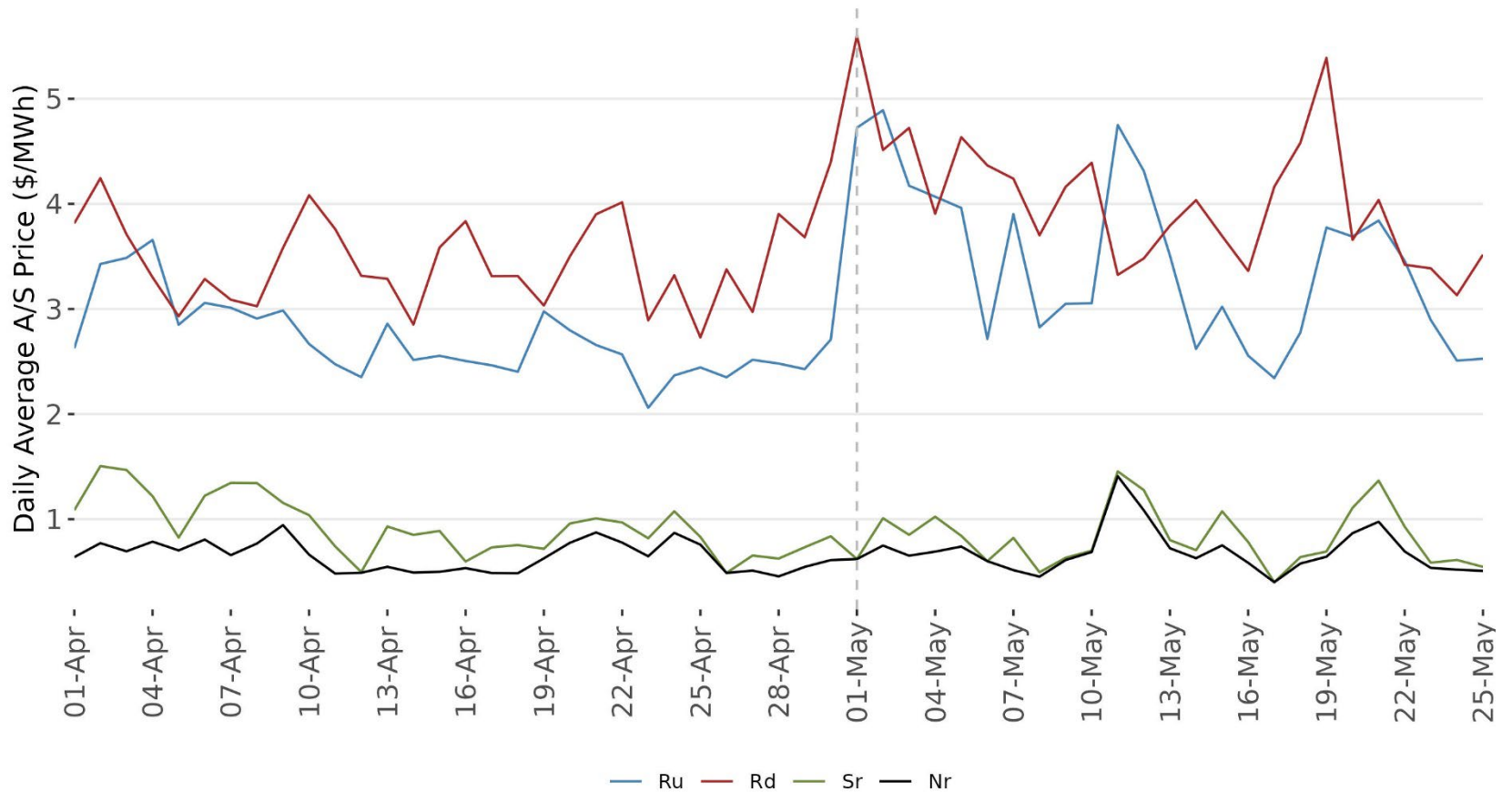
Percentage of RSE Passes (%)



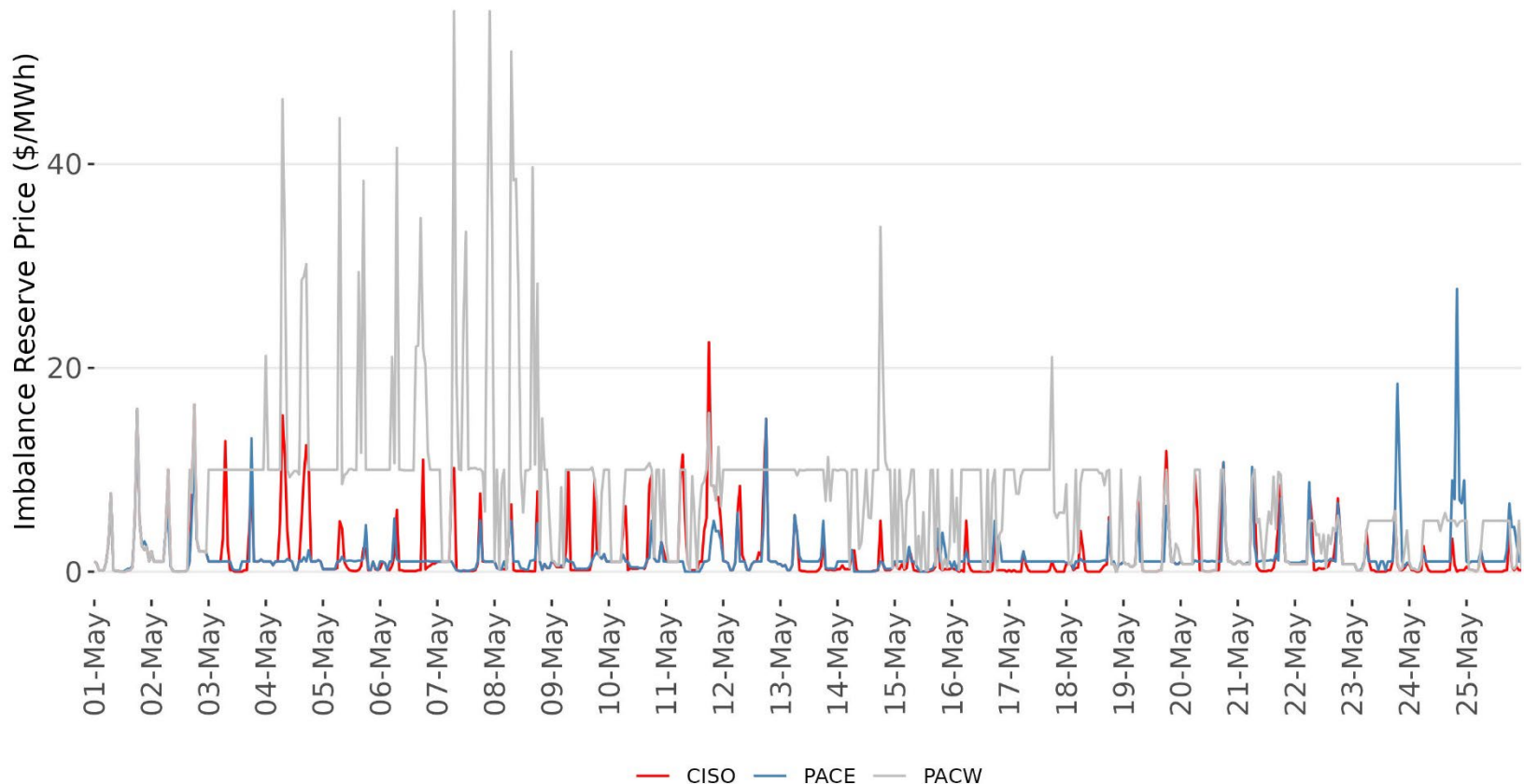
IFM daily average GHG prices have mostly been higher than FMM and RTD compared to earlier in the month



After EDAM launch, CAISO average daily prices for regulation are slightly higher

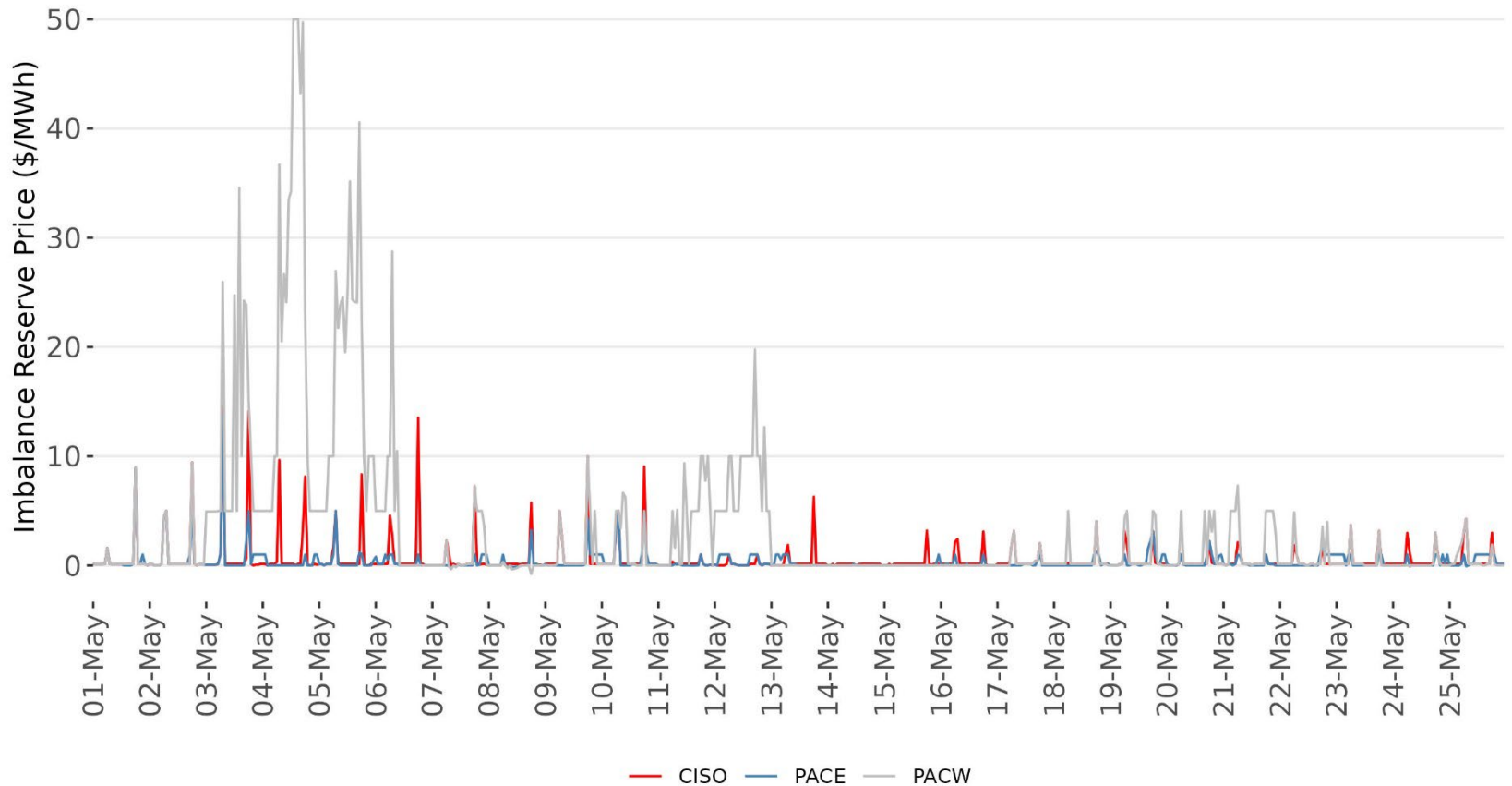


Imbalance Reserve Up (IRU) prices show separation among areas, reflecting the economics of the market footprint



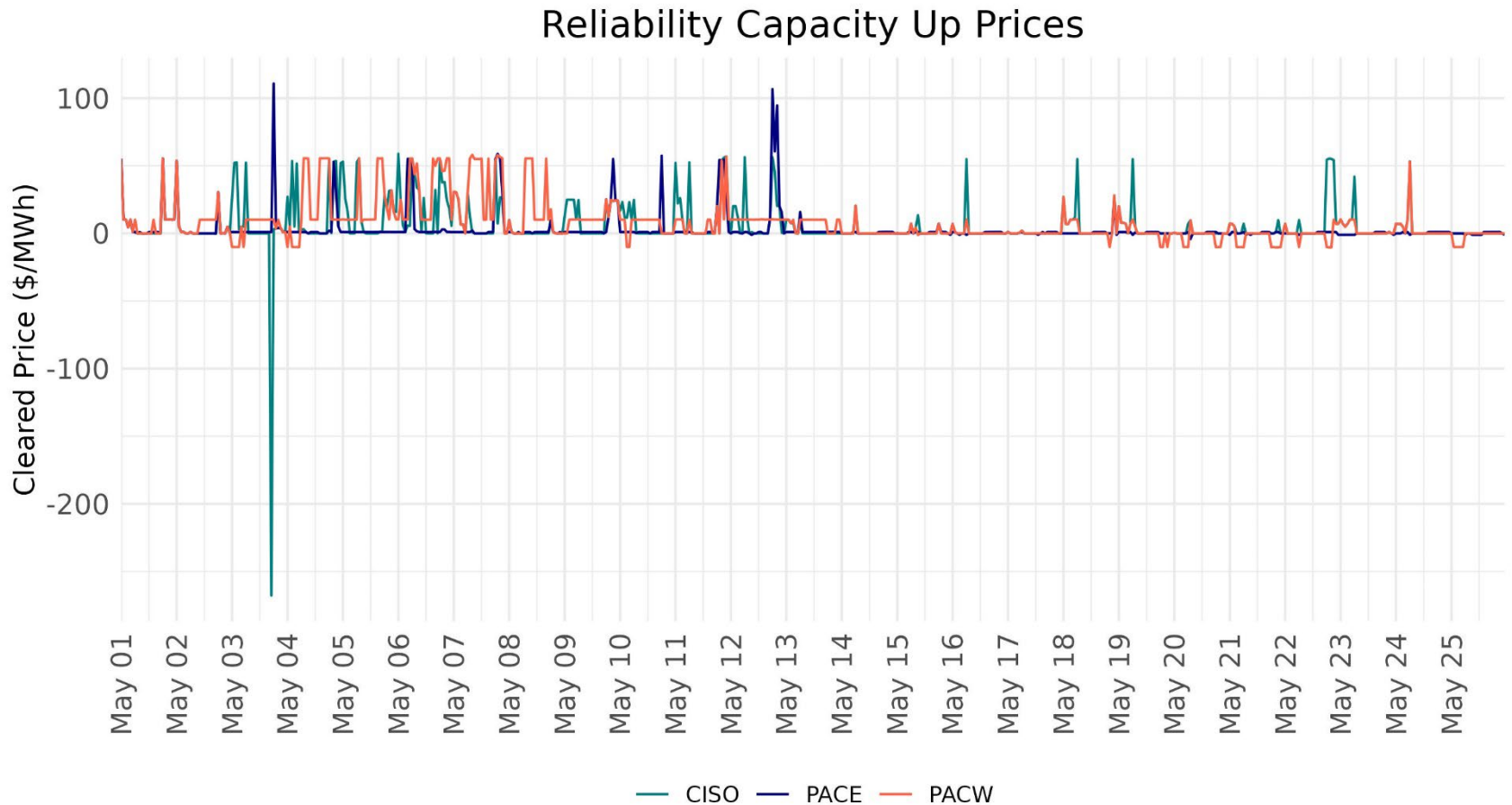
Prices trended lower after first days of operations

Imbalance Reserve Down (IRD) prices have been relatively lower than IRU prices

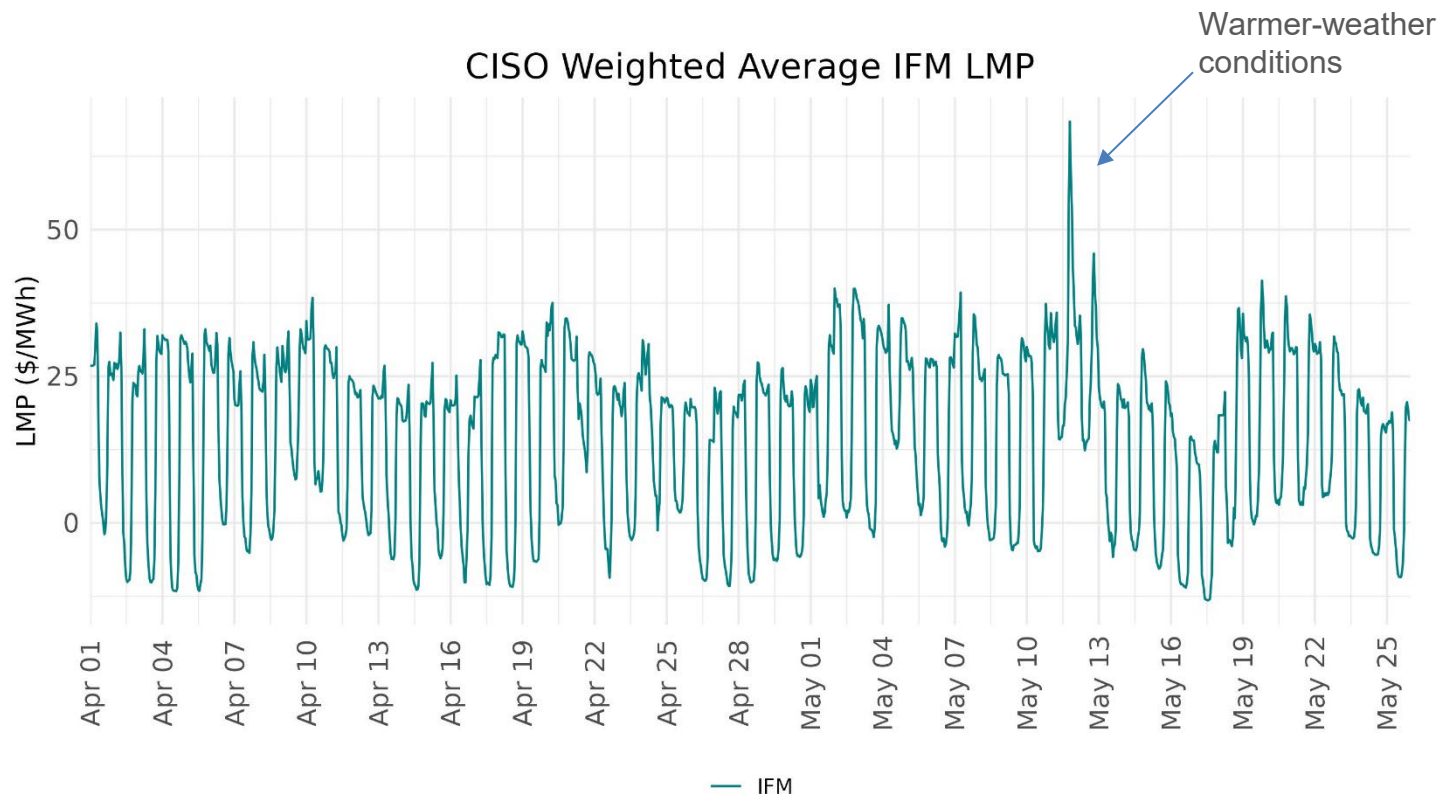


IRD prices trended lower after first days of operations

Reliability Capacity Prices have trended lower in recent days

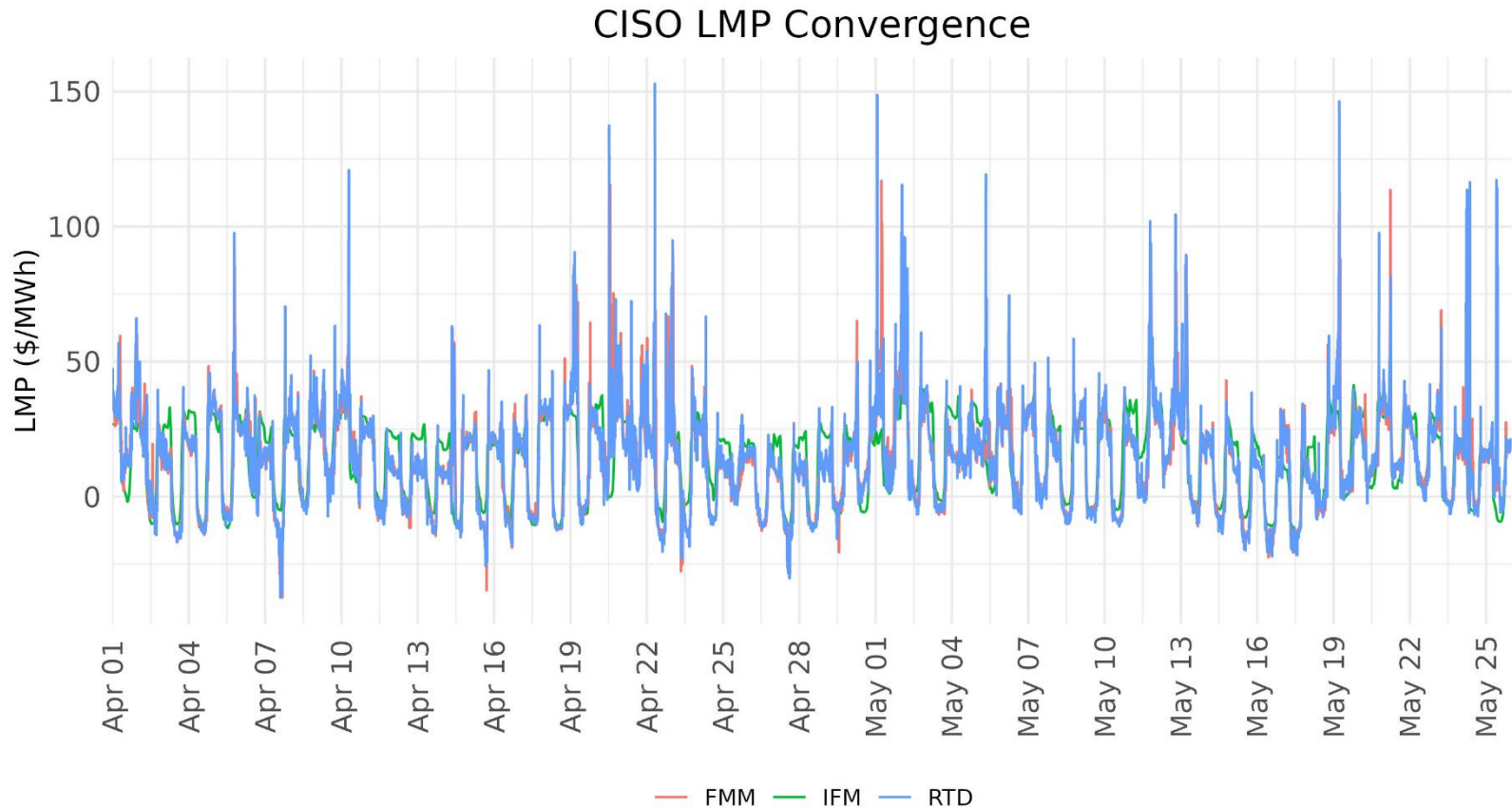


Energy prices are within typical economic range for the season of the year

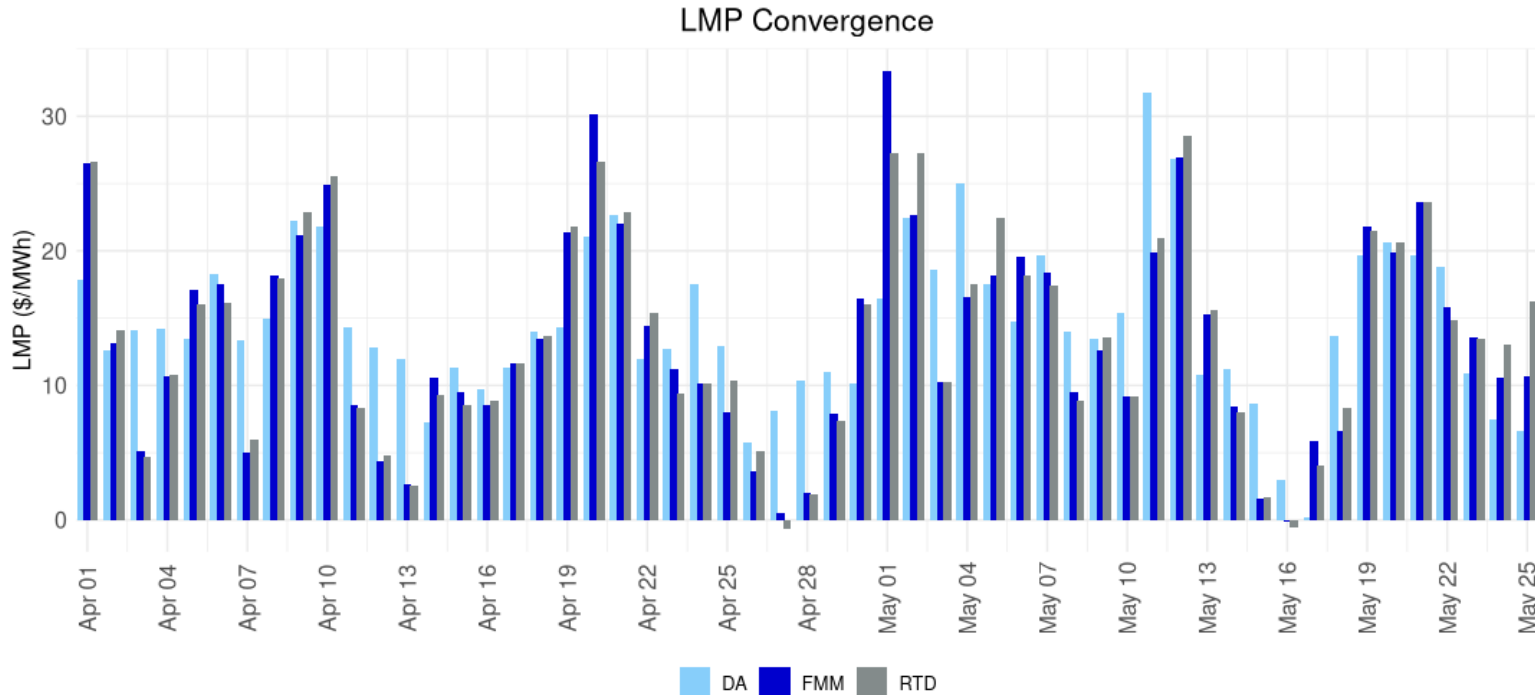


Lower prices in midday hours and higher prices in morning and evening peaks

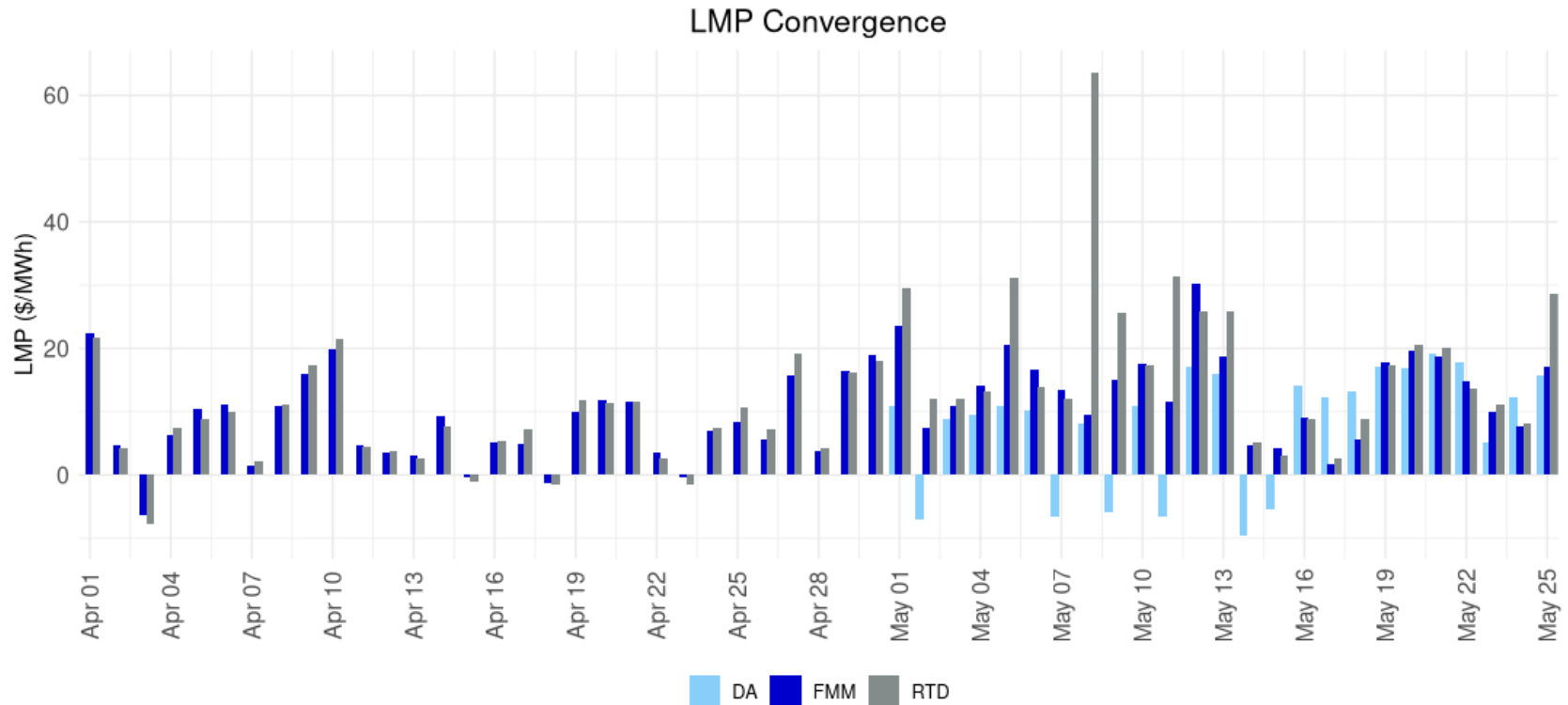
CAISO prices across markets show similar trends, with more volatile RTD prices relative to day-ahead prices



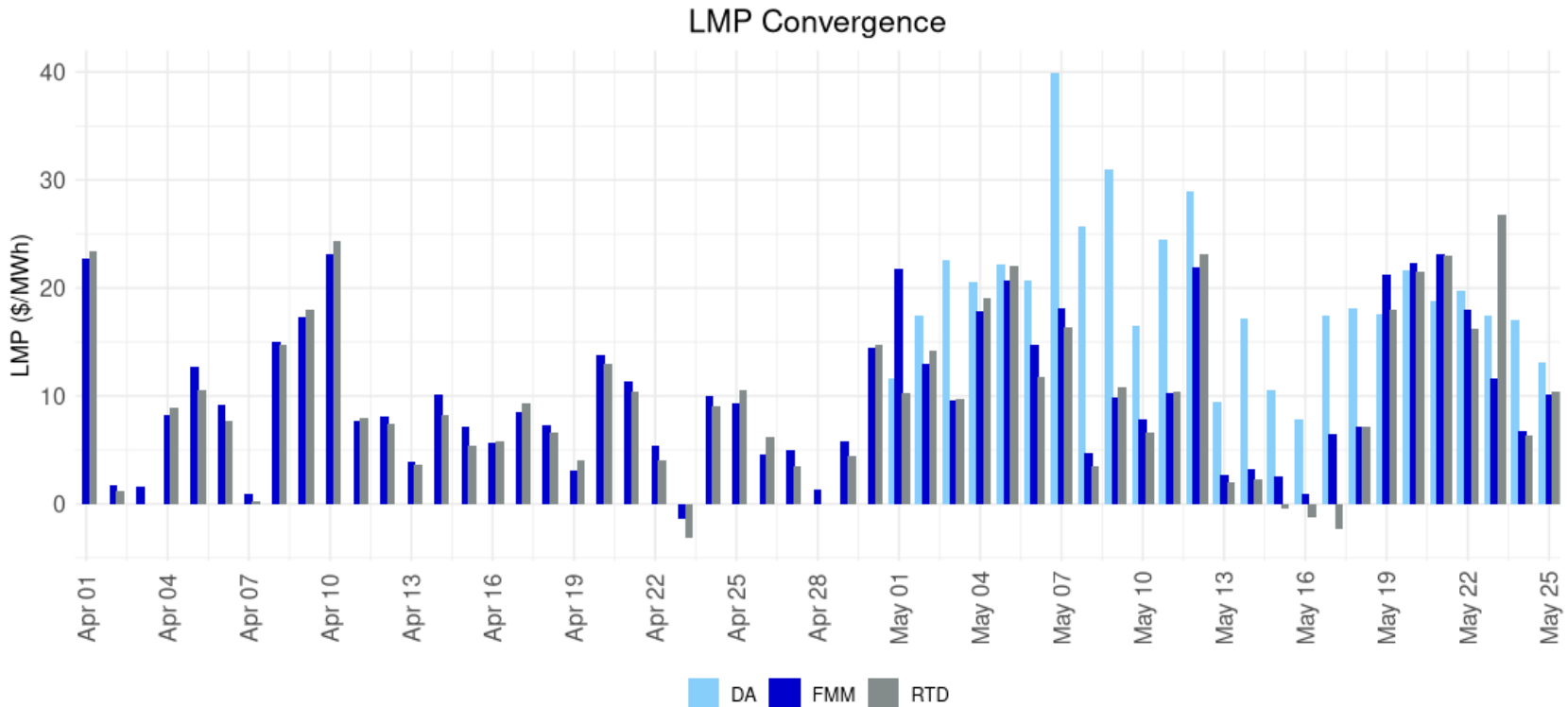
Daily price convergence for CAISO area still premature to see longer trends



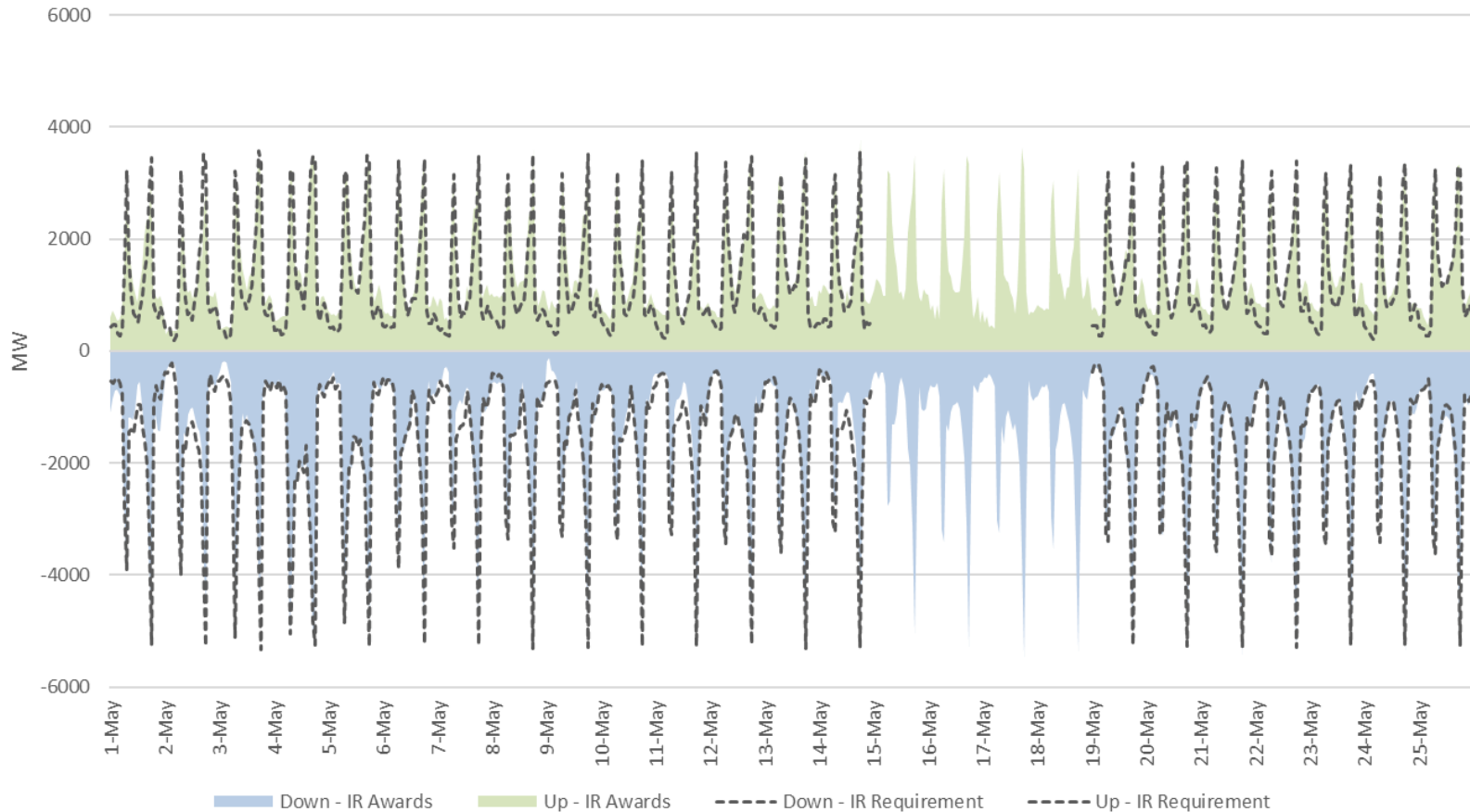
PACE price convergence has improved in the second half of May



PACW day-ahead prices converging better to real-time prices after first days of operation

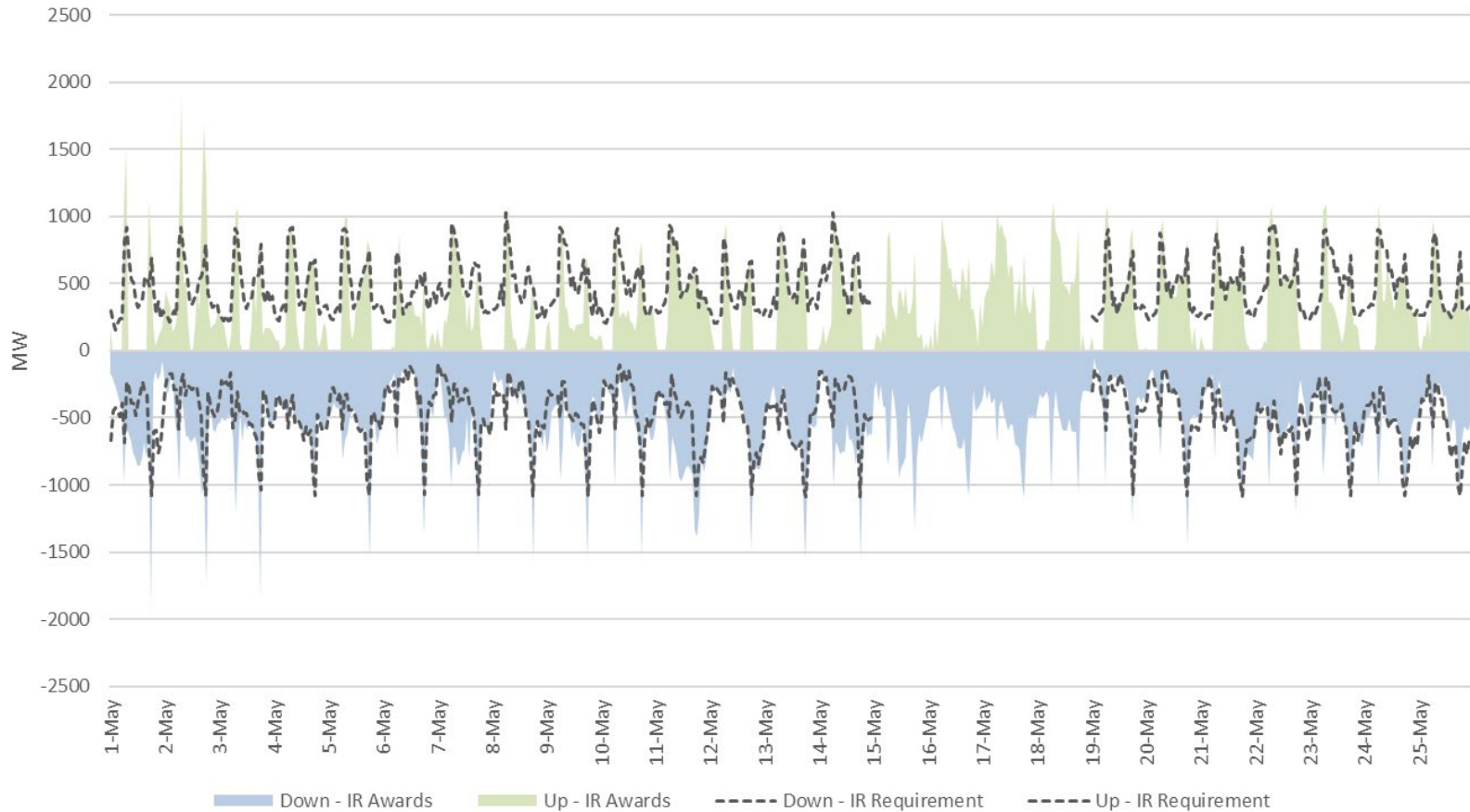


CISO BAA Imbalance reserve procurement has been stable since go-live



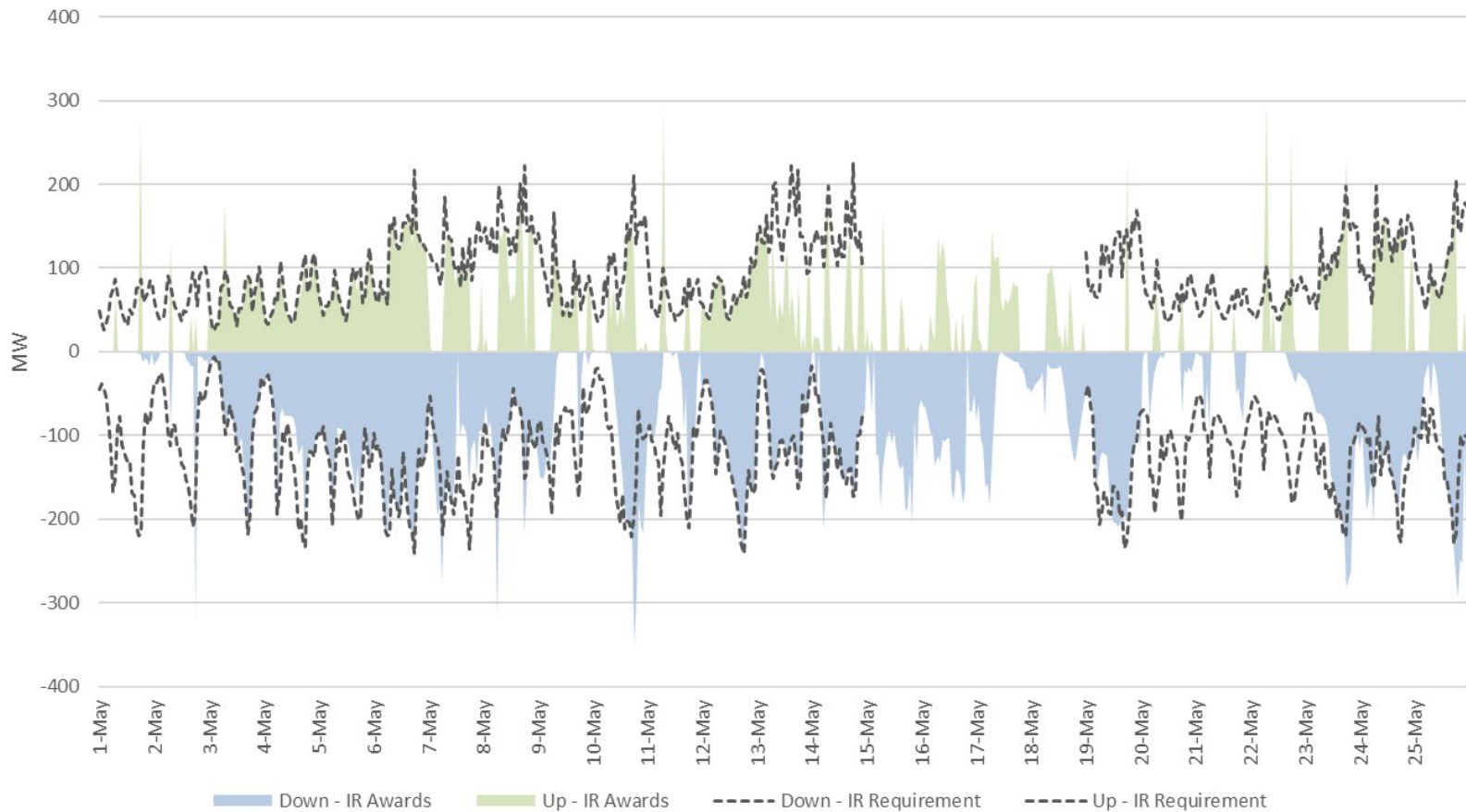
*Difference of requirement and awards total is balanced through transfers or use of demand curve

Trend of PACE BAA IR procurement has also been consistent



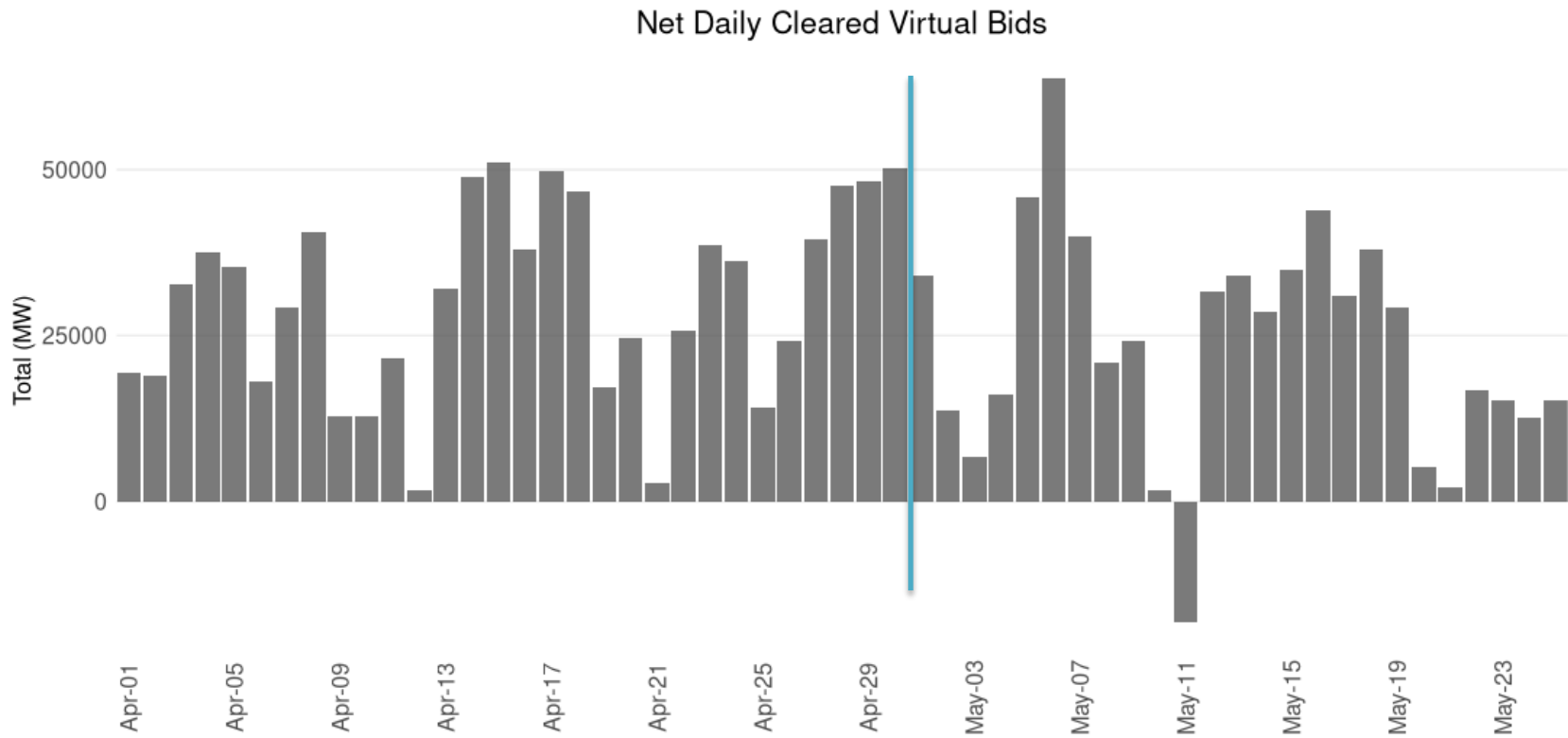
*Difference of requirement and awards total is balanced through transfers or use of demand curve

PACW BAA IR requirements have been met with both internal supply and transfers

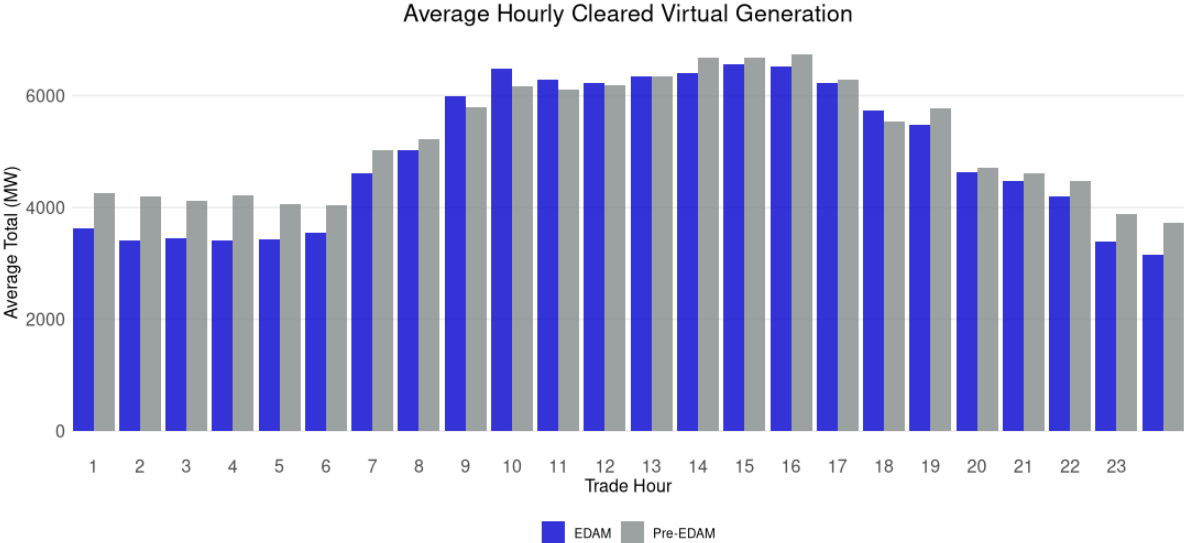
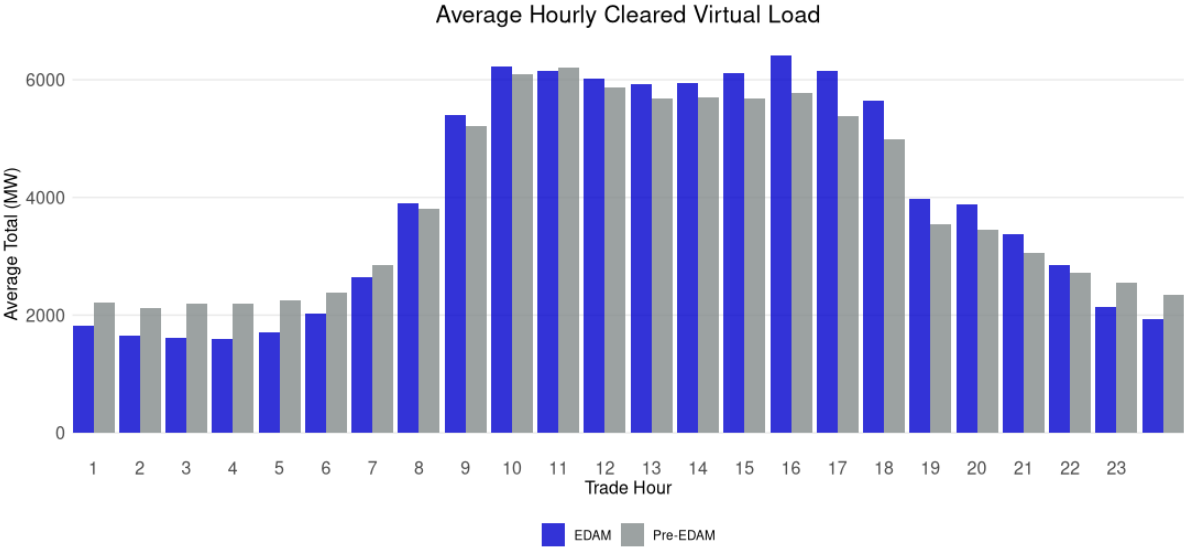


*Difference of requirement and awards total is balanced through transfers or use of demand curve

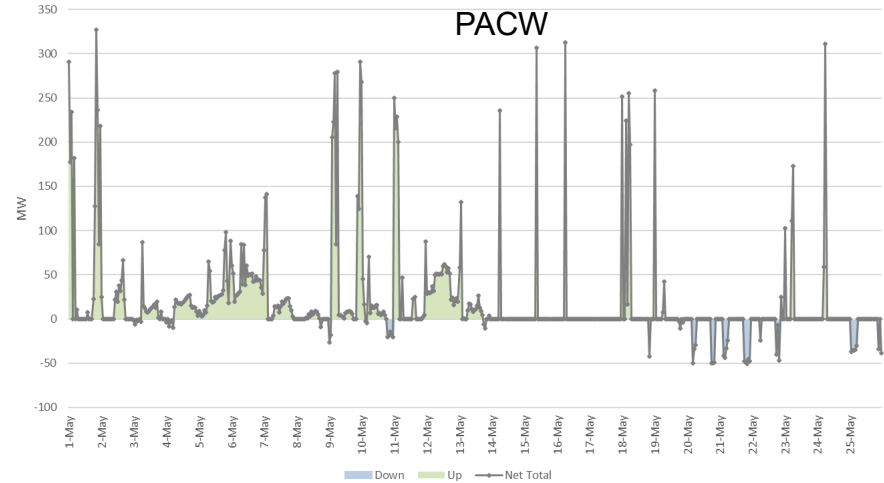
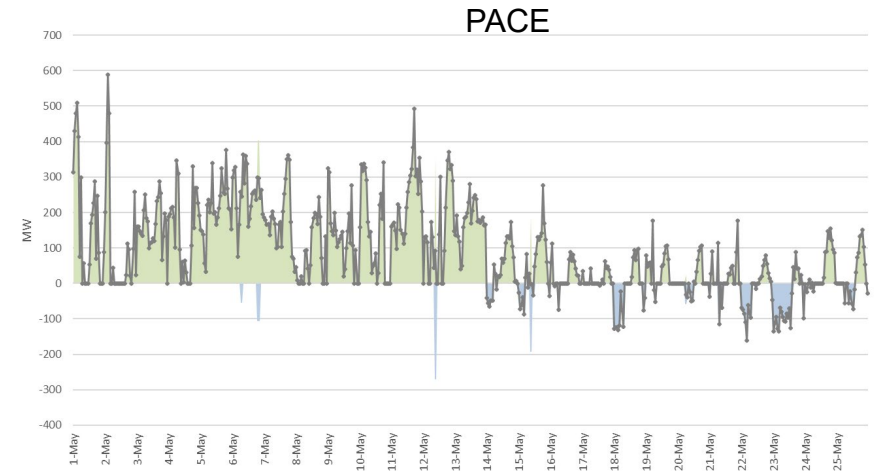
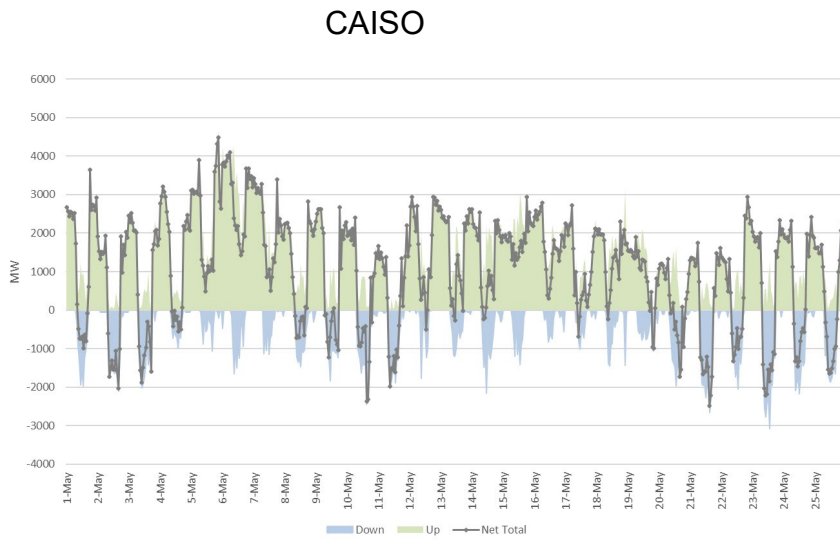
Net daily cleared virtual bids does not show a noticeable difference after EDAM



The hourly profile of cleared virtual demand and supply remains largely consistent after EDAM launch

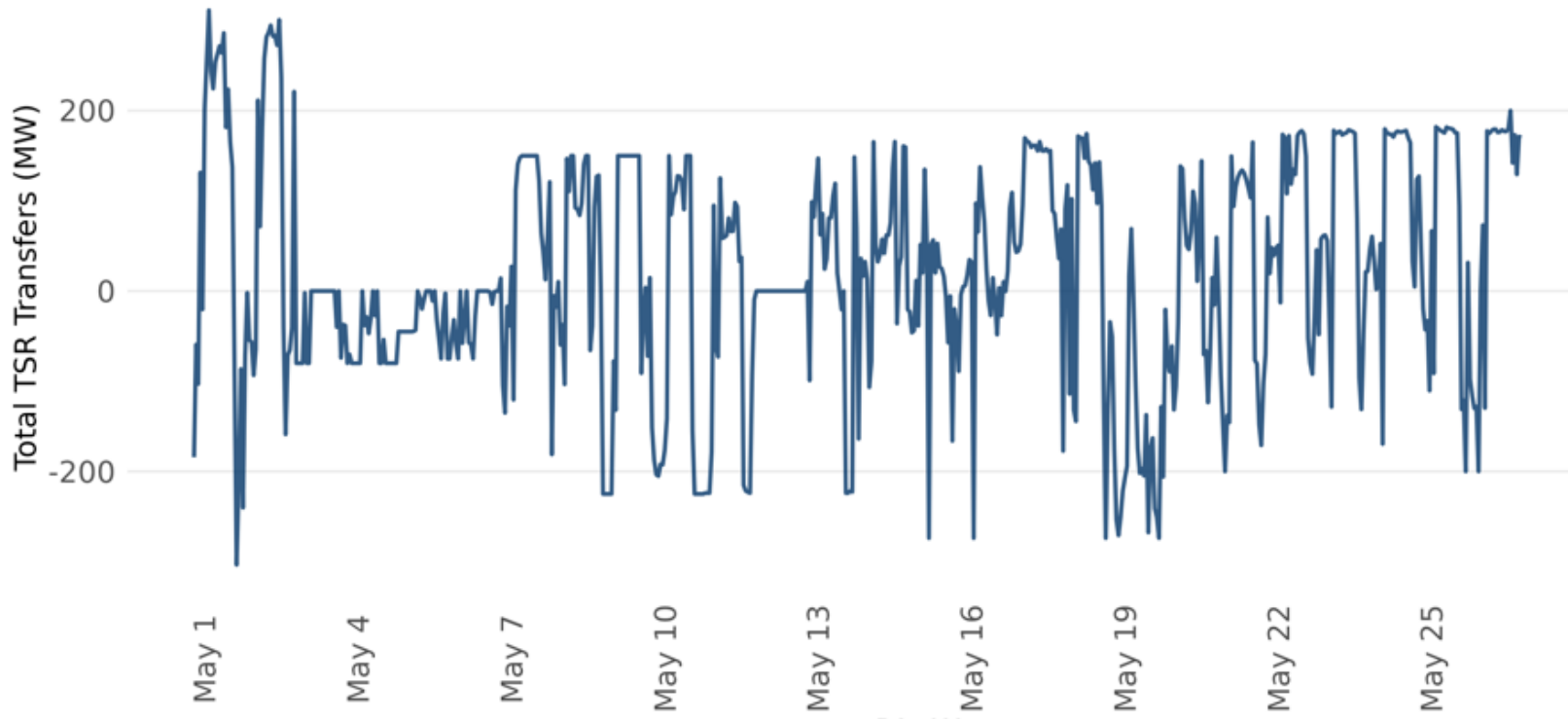


Reliability Capacity needs and procurement have been evolving, with CAISO BAA generally clearing in the upward direction



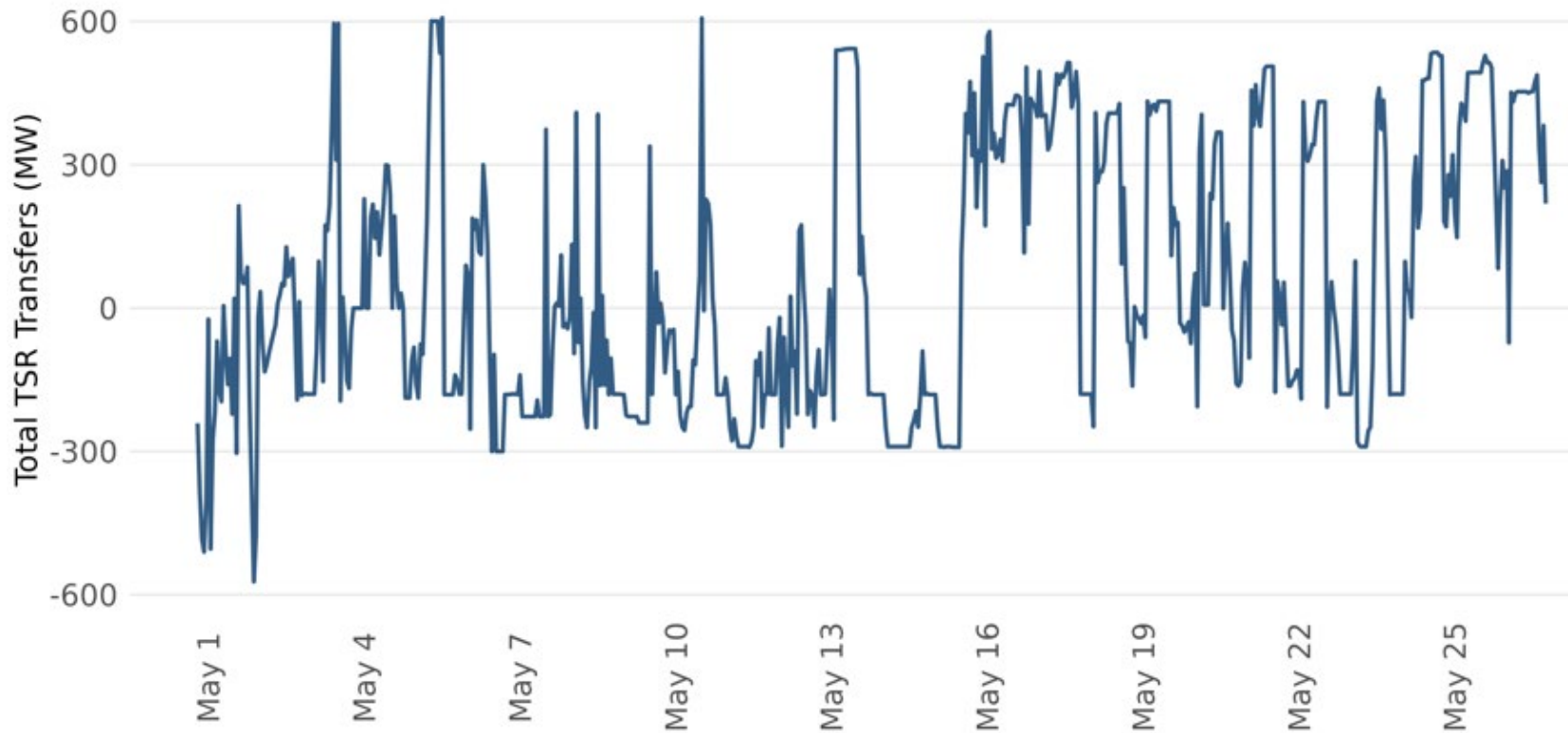
TSR net transfer between CISO and PACW has been in both directions

$$\text{NET TSR value} = \text{IFM Energy} + \text{RCU} - \text{RCD}$$



Net transfer
+ ve: export
- ve: import

TSR net transfers between CISO and PACE have been also in both directions



Net transfer
+ ve: export
- ve: import

Questions on EDAM results

Q: Prior to EDAM, the majority of the Flexible Ramp Aggregate Awards of FRU and FRD in RTPD and RTD were shown to be in the FRU_PASS_GRP and FRD_PASS_GRP under the Flexible Ramp Aggregate Awards report in Oasis. After EDAM, the amounts of Flexible Ramp Aggregate Awards shown have been generally very small and in many hours are shown as null despite their being amounts shown in the Flexible Ramping Requirements. Please explain what caused these changes and whether this is a reporting error after EDAM was launched or if procurement amounts have changed.

A: Price corrections were performed for the first three days and were covered in the previous market update call

May 1-3: Invalid Flex Ramp Product prices due to a software defect impacting the FRP requirement

A: (Continues in the next slide)

A: There was an OASIS reporting issue for flexible ramp aggregate awards for FRU_PASS_GRP and FRD_PASS_GRP. This was fixed May 12 and awards are available after May 12 and the results are similar to pre-EDAM expected results.



OASIS ATLAS REFERENCE REPORT DEFINITION PRICES TRANSMISSION SYSTEM DEMAND ENERGY ANCILLARY SERVICES CONGESTION REVENUE RIGHTS PUBLIC BIDS RESOURCE ADEQUACY

Date: 05/01/2026 To: 05/12/2026 Market/Process: RTPD BAA Group: FRU_PASS_GRP Ramp Type: [ALL] Apply Reset

Download XML Download CSV

Flexible Ramp Aggregate Awards

Opr Date	Balancing Authority Area Group	Market	Ramp Type	Interval	HE01	HE02	HE03	HE04	HE05	HE06	HE07	HE08	HE09	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24	HE25
05/01/2026	FRU_PASS_GRP	RTPD	DOWN	1																									
05/01/2026	FRU_PASS_GRP	RTPD	UP	1	698.34																								
05/12/2026	FRU_PASS_GRP	RTPD	DOWN	1																									
05/12/2026	FRU_PASS_GRP	RTPD	UP	1																									
05/12/2026	FRU_PASS_GRP	RTPD	DOWN	2																									1,483.57
05/12/2026	FRU_PASS_GRP	RTPD	UP	2																									1,475.81
05/12/2026	FRU_PASS_GRP	RTPD	DOWN	3																									
05/12/2026	FRU_PASS_GRP	RTPD	UP	3																									1,463.47
05/12/2026	FRU_PASS_GRP	RTPD	DOWN	4																									
05/12/2026	FRU_PASS_GRP	RTPD	UP	4																									1,449.08

OASIS ATLAS REFERENCE REPORT DEFINITION PRICES TRANSMISSION SYSTEM DEMAND ENERGY ANCILLARY SERVICES CONGESTION REVENUE RIGHTS PUBLIC BIDS RESOURCE ADEQUACY

Date: 05/13/2026 To: 05/26/2026 Market/Process: RTPD BAA Group: FRU_PASS_GRP Ramp Type: [ALL] Apply Reset

Download XML Download CSV

Flexible Ramp Aggregate Awards

Opr Date	Balancing Authority Area Group	Market	Ramp Type	Interval	HE01	HE02	HE03	HE04	HE05	HE06	HE07	HE08	HE09	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24	HE25
05/13/2026	FRU_PASS_GRP	RTPD	UP	1	1,182.60	963.47	1,139.96	1,060.83	1,135.00	1,165.38	2,050.02	4,278.20	2,811.19	1,920.38	2,074.48	2,120.56	1,740.20	1,886.61	2,485.50	2,462.62	2,619.41	3,269.08	3,437.56	2,128.55	1,494.59	1,213.00	1,555.82	1,500.50	
05/13/2026	FRU_PASS_GRP	RTPD	DOWN	2	1,231.65	966.67	1,129.25	1,062.56	1,138.79	1,212.55	3,133.21	4,209.00	2,603.17	1,866.47	2,063.47	1,962.95	1,740.16	1,867.13	2,574.57	2,474.27	2,666.68	3,493.03	3,474.14	1,738.71	1,461.46	1,254.65	1,538.28	1,504.81	
05/13/2026	FRU_PASS_GRP	RTPD	DOWN	3	1,214.23	954.87	1,126.11	1,061.83	1,142.57	1,337.21	4,020.14	4,052.07	2,471.47	1,868.45	2,067.91	2,105.93	1,905.24	1,895.98	2,813.41	2,484.51	2,712.29	3,751.80	3,408.41	1,551.78	1,473.58	1,209.70	1,485.12	1,507.15	
05/13/2026	FRU_PASS_GRP	RTPD	DOWN	4	1,184.37	949.70	1,120.79	1,062.90	1,147.24	1,560.31	4,020.14	3,866.26	2,405.26	1,839.84	2,064.15	2,092.93	1,905.24	1,900.90	2,597.17	2,508.23	2,802.37	4,113.10	3,187.90	1,406.21	1,447.49	1,209.50	1,447.14	1,496.70	
05/14/2026	FRU_PASS_GRP	RTPD	UP	1	1,123.37	849.44	984.11	828.11	1,095.80	1,151.01	2,266.05	4,217.41	2,057.50	1,779.55	1,930.50	1,763.73	1,683.29	1,837.91	2,165.56	2,149.48	2,548.15	2,384.07	3,419.02	2,138.38	1,541.44	1,274.19	1,672.21	1,518.22	
05/14/2026	FRU_PASS_GRP	RTPD	DOWN	2	1,165.82	838.10	811.23	876.51	1,106.13	1,199.67	3,589.24	3,887.78	1,913.62	1,777.99	1,923.85	1,749.55	1,605.29	1,839.22	2,189.68	2,158.95	2,534.19	2,752.29	3,477.02	1,673.84	1,482.11	1,287.99	1,613.09	1,508.22	
05/14/2026	FRU_PASS_GRP	RTPD	UP	3	1,152.01	841.81	767.05	681.20	1,121.97	1,339.48	4,023.83	3,232.12	1,778.24	1,778.73	1,917.99	1,734.33	1,698.62	1,839.48	2,233.27	2,162.20	2,528.32	3,216.09	3,418.15	1,455.40	1,472.91	1,276.95	1,579.49	1,501.00	
05/14/2026	FRU_PASS_GRP	RTPD	DOWN	4	1,128.01	837.60	747.38	889.19	1,130.01	1,541.83	4,023.83	2,472.51	1,709.50	1,780.61	1,911.60	1,725.04	1,699.05	1,841.53	2,285.42	2,172.76	2,533.66	3,794.24	3,155.57	1,303.50	1,455.56	1,284.35	1,543.75	1,503.33	



Q: Please provide the mathematical formulation supporting the implemented approach for EDAM, including the BAA power balance constraint, applicable transfer constraints, and how associated shadow prices enter into LMP via MEC and MCC.

A: The detailed mathematical formulation is available in the Extended Day-Ahead Market Draft Technical Description on the EDAM Stakeholder Initiative page; the ISO will assess if additional details need to be incorporated into the applicable BPM.

Q: Are the IR awards considered in the resource ramp constraints?

A: Yes, the IR products are incorporated into the resource ramp constraints. The IR products are 30-minute awards. A granularity adjustment factor of 2 is applied to convert the 30-minute awards to hourly ramp values.

Q: Which constraints are applied to the battery state of charge (SOC) in EDAM? Are the same constraints applied in the RTM?

A: In EDAM, the envelope constraints replaced the SOC^{AT} constraints. The envelope constraints include the impact of energy, regulation, imbalance reserve, and reliability capacity on the battery SOC. In the RTM, the SOC^{AT} constraint continues to be enforced as before EDAM go-live. There are no envelope constraints in the RTM. The energy only constraints continue to be enforced in both day-ahead and real-time.

Q: Provide evidence that the IR is working to address uncertainty

A: There is no sufficient data as of now to conclusively assess the overall performance of the new products. As the ISO continues to collect operational data, the ISO will report on the performance of the EDAM relative to the new IR product.

Q: Market Participants have not seen Day-Ahead Advisory RSE results published prior to the 10am binding run.

A: ISO is exploring if the advisory RSE results can be published immediately after the RSE runs.

Q: Missing shift factors for several binding constraint-hours over the first 15 days of May.

A: Yes, the ISO has identified an issue preventing the posting of all shift factors in the participant portal. A fix for this issue is in progress

Q: The CRR Revenue Adjustments Reports published on CMRI, show discrepancies in CRR notional values and unable to reconcile using the Constraint Shadow Price and Shift Factor reports

A: The OASIS CRR Aggregated Revenue Adjustment report is missing results for some IRU/IRD deployment scenario constraints; a fix for this issue is also in progress

Price Corrections

The price correction time horizon has been extended

- For 180 days from May 1, the day-ahead correction time horizon is extended from 3 BD to 10 BD
- For 180 days from May 6, the real-time correction time horizon is extended from 5 BD to 10 BD
- Price Correction Messages are available on OASIS

OASIS **ATLAS REFERENCE** REPORT DEFINITION PRICES TRANSMISSION SYSTEM DEMAND ENERGY ANCILLARY SERVICES CONGEST

Date From: To: Market/Process: [ALL]

Price Correction Messages

21 - 23 of 23

Message Time	Market	Message Text
05/08/2026 16:10	RTPD	Trade Date: 5/2/2026 Market: FMM Hour(s): 6-8 Interval(s): various Constraint: n/a Commodity: Energy and GHG Method: Selective recalculation Reason: Invalid Greenhouse Gas shadow prices and MEC due to a software defect impacting the power balance constraint.
05/08/2026 14:43	RTD	Due to a business processing issue, various intervals of price correction for trade days 05/01/26 & 05/03/26 were not processed. CAISO plans to have the corrections published by COB Friday, 05/15/2026.
05/08/2026 14:43	RTPD	Due to a business processing issue, various intervals of price correction for trade days 05/01/26 & 05/03/26 were not processed. CAISO plans to have the corrections published by COB Friday, 05/15/2026.

Day-Ahead Market Price Corrections

- May 1-14 IFM and RUC: Invalid prices due to a data input error impacting the HVDC shadow price and SP-Tie price calculations.
 - The HVDC shadow prices for PDCI and IPPDC were not reported correctly due to missing APnode prices at the HVDC terminals.
 - As a result, the SP-Tie prices associated with PDCI and IPPDC did not accurately reflect the corresponding HVDC shadow prices.
- May 2-3 IFM and RUC: Invalid ITC congestion shadow prices due to a software defect causing incorrect implementation of ITC constraints.
 - ITC constraints did not adequately account for the different commodities, including ancillary services, imbalance reserves, and reliability capacity.
- May 9-18 IFM and RUC: Invalid MALIN500_ISL congestion due to a software defect causing incorrect implementation of ISL constraints.
 - Like the ITC constraints, the MALIN500_ISL constraint did not adequately account for the various commodity types, including ancillary services, imbalance reserves, and reliability capacity.

Day-Ahead Market Price Corrections

- May 12 IFM and RUC: Invalid congestion on CASCADE_ITC occurred because the ITC limit was set lower than the stranded load schedule.
- May 15-19 RUC: The SP-Tie prices associated with PDCI and IPPDC in RUC did not accurately reflect the corresponding HVDC shadow prices due to a software defect.

Real-Time Market Price Corrections

- May 1-15: Invalid ITC congestion due a data input error impacting the limit of the ITC.
 - PACW_CRAG_ITC limit is not aligned between IFM and RTM.
- May 12: Invalid congestion on CASCADE_ITC occurred because the ITC limit was set lower than the stranded load schedule.
- May 6 to 15: Invalid IPPUTAH_ITC price due to a software defect impacting ITC constraints.
 - The market software did not properly account for inter-hour ramping on TSR schedules, resulting in overloads on the ITC.
- May 6-16: Incorrect prices due to a data input error impacting transfer location pricing, missing ITC to transfer location mapping.
 - It caused transfer location prices to not correctly reflect ITC congestion shadow prices.

Next Steps

- Participants can submit inquiries through the CIDI
- The ISO continues to perform price validation and correction within the extended 10 business days
- The ISO will provide monthly performance reports on EDAM performance followed by a public meeting
 - May results will be reported and discussed in the second half of June