



Extended Day-Ahead Market Performance May report

Market Performance and Advanced Analytics

June 25, 2026

Executive Summary

- Overall, market outcomes were robust and broadly aligned with expectations, reflecting a stable transition to expanded day-ahead market functionality
- However, results should be viewed as preliminary and subject to adjustments
 - May results reflect a transition to a new market design
 - Market participants adapting and learning about the EDAM/DAME features
 - Ongoing resolution of identified issues in market outcomes and settlements, including price corrections
 - Moving from a shoulder month conditions towards summer conditions
- This report provides an overview of market performance during the first month of EDAM/DAME operations. This is the first of six monthly performance reports

Executive Summary

- EDAM results were posted before 1:00 p.m. in 61 percent of days, down from April's 77percent, reflecting additional validation steps needed due to the new market operations
- Resource sufficiency performance was strong across all participating areas with a passing rate over 99 percent of the time
- Day-ahead energy prices remained moderate and seasonally consistent. Prices separated across the different balancing authority areas, reflecting underlying system conditions
- The newly introduced imbalance reserve and reliability capacity products performed as expected with moderate prices and requirements largely procured economically

Executive Summary

- EDAM transfers were actively used across energy and the new products (imbalance reserve and reliability capacity) in both import and export directions across all participating areas
- Total congestion revenue allocation related to parallel flows across EDAM areas were moderate relative to the total congestion costs
- Total wholesale costs in CAISO remained stable (~\$19/MWh), continuing a broader trend of lower costs in 2026 compared to 2025
- This report includes a summary of identified issues that affected market functionality, required price corrections, or have impacted settlement outcomes

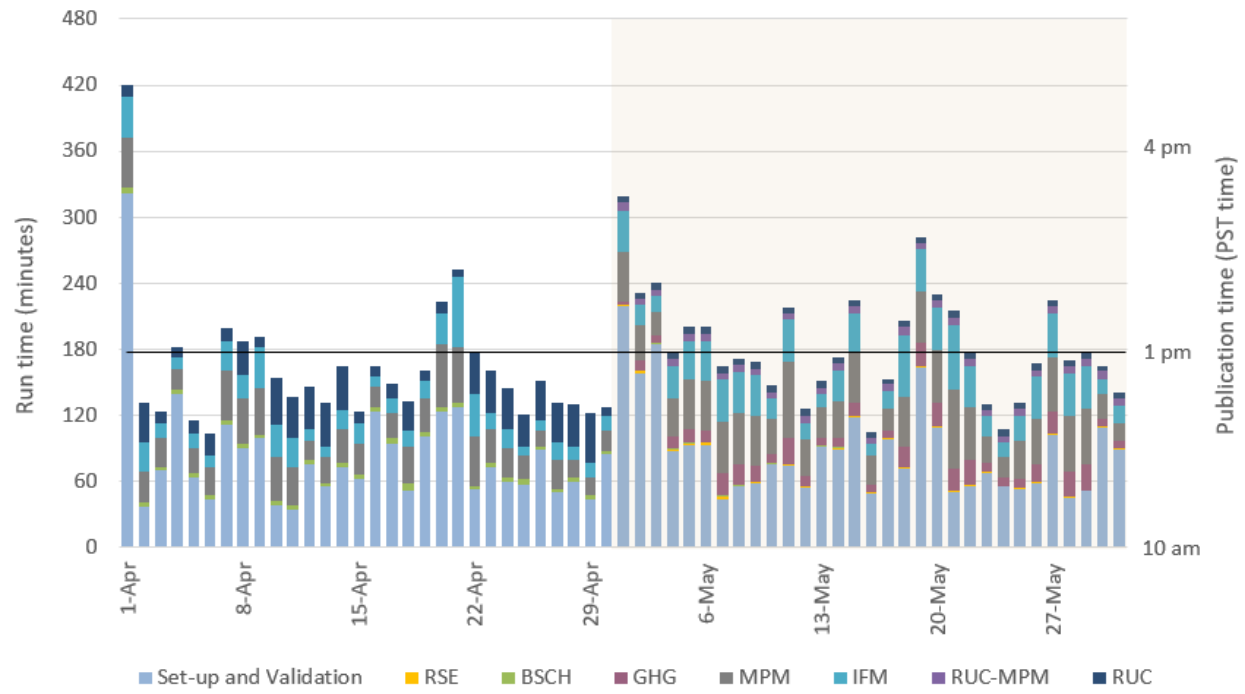
The extended day-ahead market was successfully launched on May 1, 2026

- The extended day-ahead market (EDAM) footprint consists of ISO, PacifiCorp East and PacifiCorp West balancing authority areas.
- Concurrent with EDAM, a suite of new market features were implemented as part of the day-ahead market enhancements (DAME).
- There are two new market products: imbalance reserves up and down (IRU/IRD) and reliability capacity up and down (RCU/RCD).
- Additionally, the EDAM/DAME introduces the modelling for greenhouse-gas allocation and pricing
- The imbalance reserve product allows the market to procure flexible capacity to meet day-ahead to real-time uncertainty.
- Procuring this capacity through the market ensures that flexibility is procured at the least cost and explicitly priced.

Proactive review and validation of the day-ahead market run produced robust results

The extended day-ahead market is:

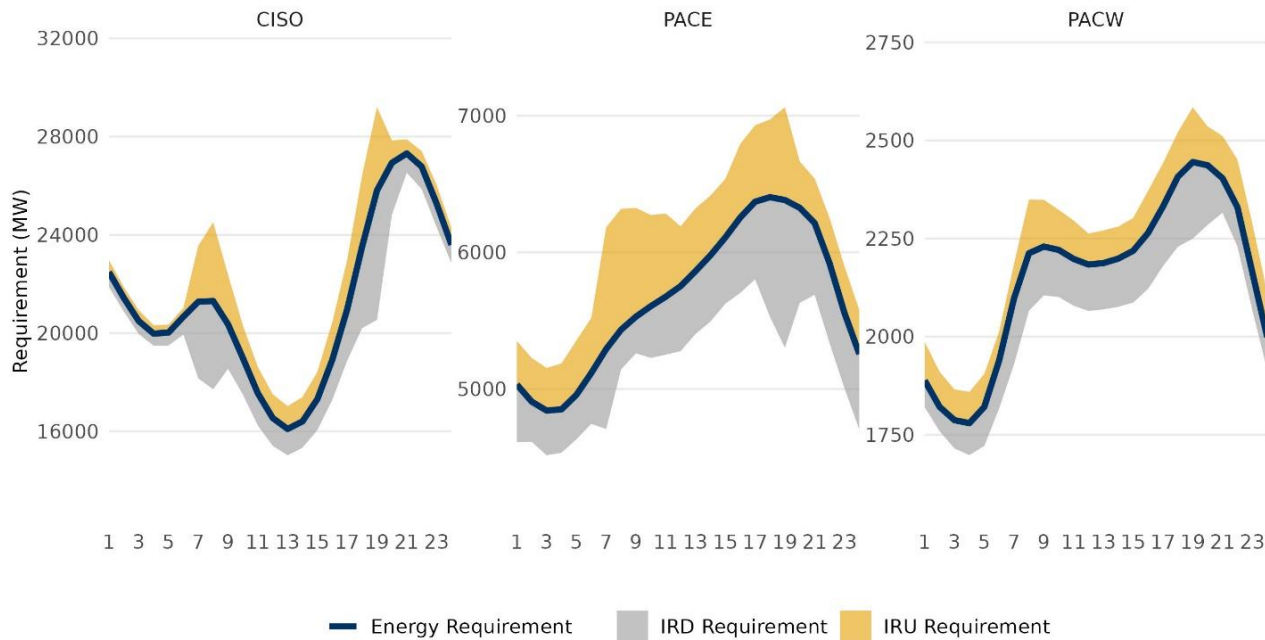
- solving for a larger and more complex system.
- clearing new market products.
- running additional processes.



The ISO has proactively taken additional time to validate the day-ahead market in the first days of operation.

The ISO continues to closely review and validate results with the goal to publish by the 1pm deadline.

All participating areas in the extended day-ahead market had sufficient capacity to meet their own needs



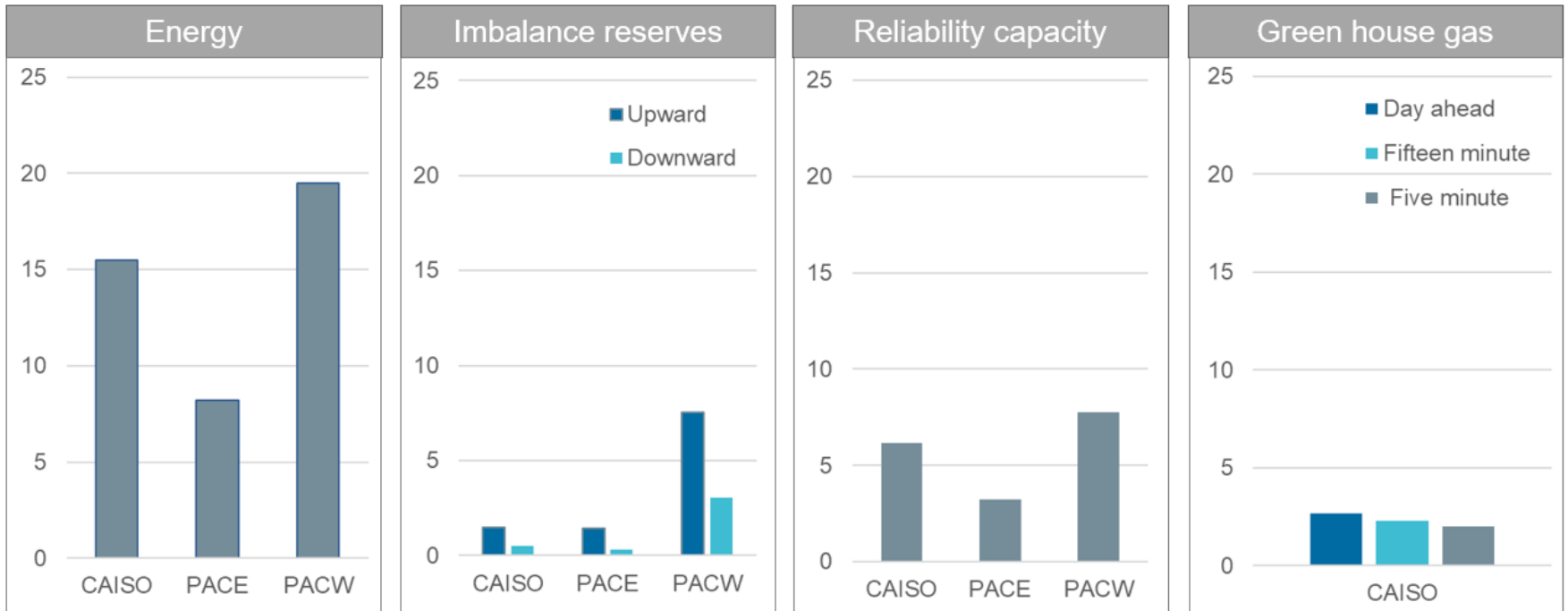
The extended day-ahead market includes a resource sufficiency evaluation

Area	Pass rate
CAISO	100.0%
PACE	100.0%
PACW	99.4%

- This test ensures each participating area makes sufficient capacity available in the day-ahead market to meet its own needs.
- This test is applied in both upward and downward directions to meet needs for both energy and flexibility.

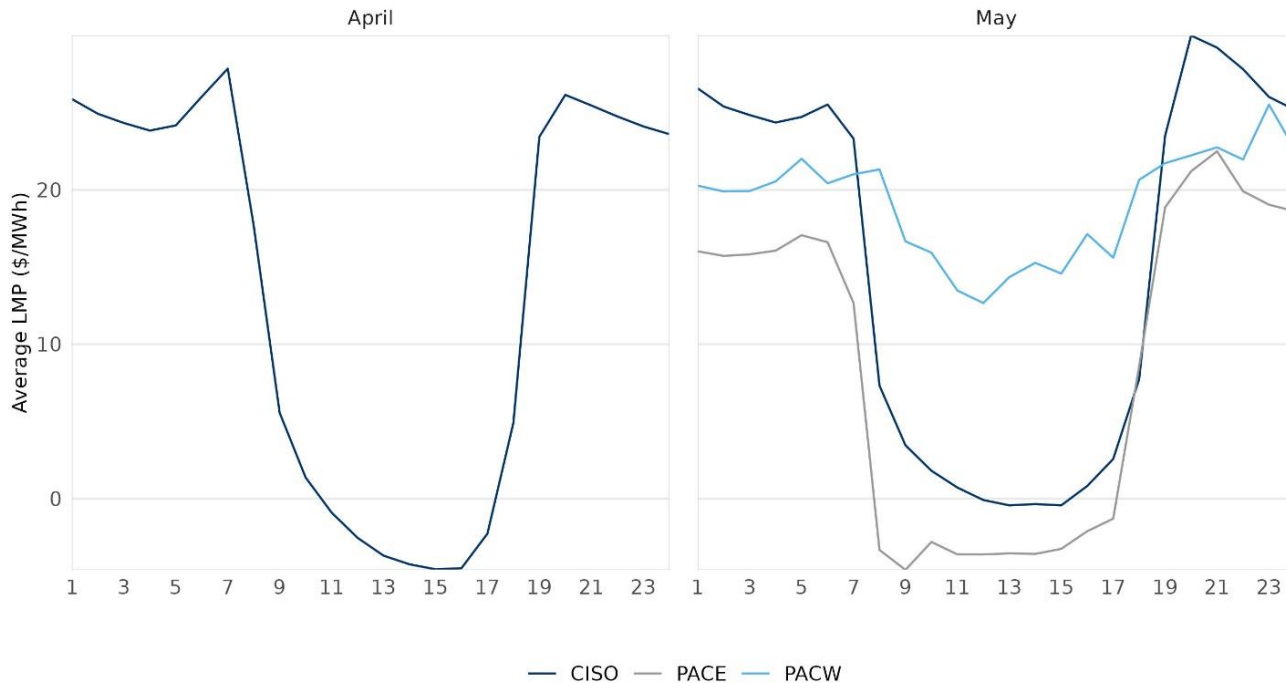
Prices for all commodities are within expected economic ranges and seasonally consistent

■ Monthly average prices in dollar per megawatt-hour observed in May 2026 for the various market products



The extended day-ahead market prices show explicitly the economic value of flexibility, reliability reserves and greenhouse gas.

Energy prices remain moderate, consistent with typical daily load patterns during shoulder-season conditions



Spring shoulder months tend to feature low prices in midday and high prices in morning and evening peaks due to the availability of renewable supply.

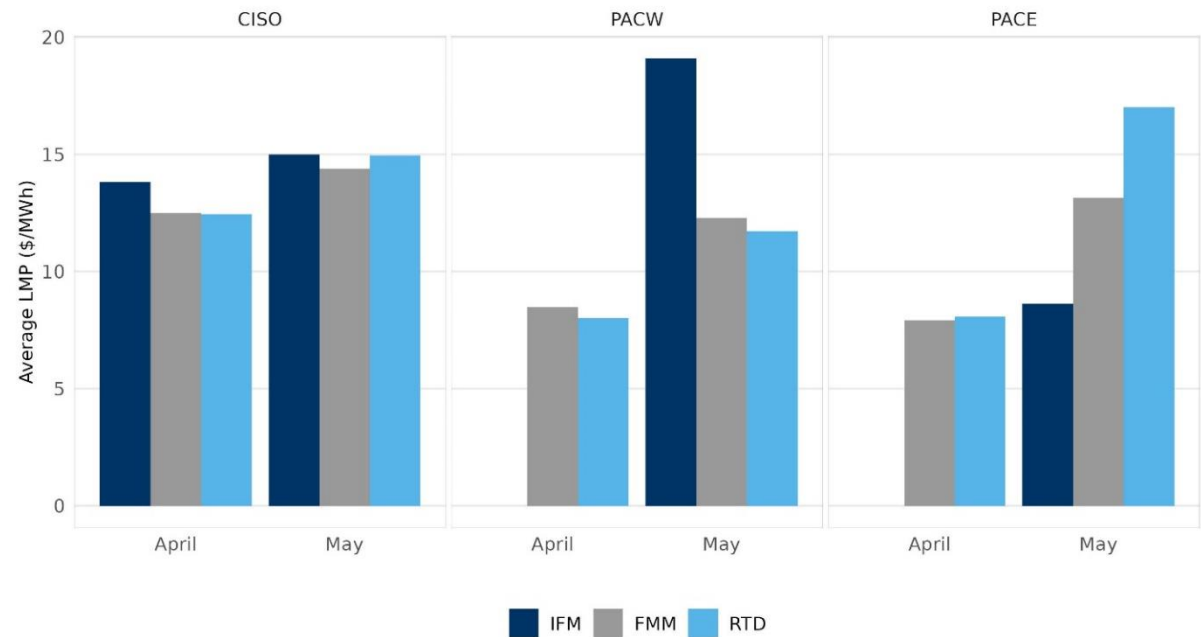
Prices show regional separation, with PACE posting the lowest prices while PACW tended to clear higher.

The ISO area exhibited higher prices during peak hours.

The difference between day-ahead and real-time prices varied across BAAs

On average,

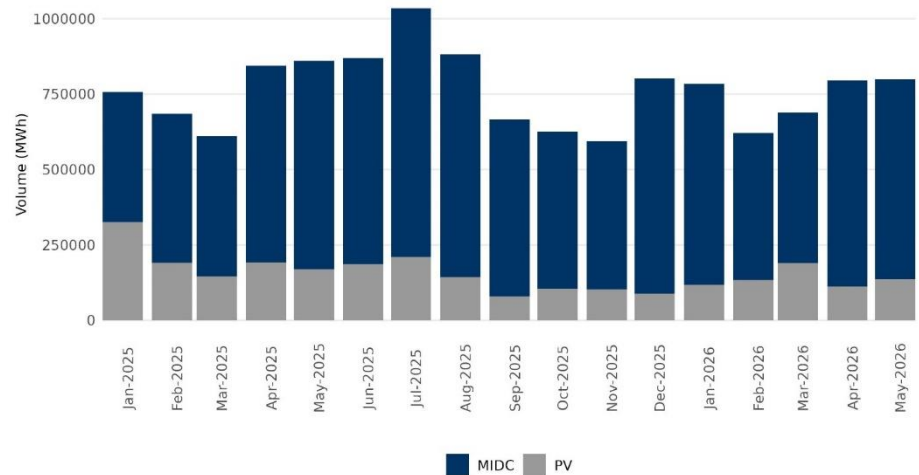
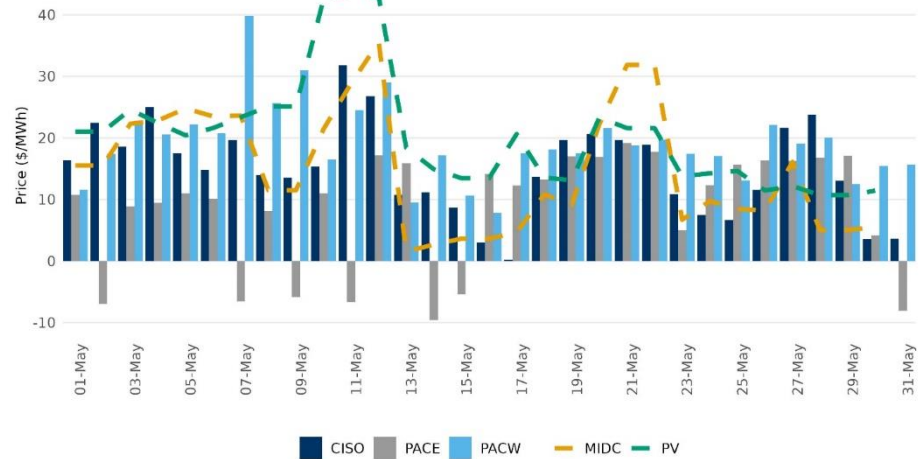
- prices in day-ahead and real-time tracked closely in CAISO area
- day-ahead prices were higher than real-time prices in PACW
- day-ahead prices were lower than real-time prices in PACE



There was more price volatility in the first days of operation, which subsided as the market adjusted to new functionality and processes

External bilateral indices appear largely unaffected by EDAM implementation

- Bilateral prices generally tracked the day-ahead market prices
- Closer tracking of bilateral prices to CAISO area prices
- Daily volume and monthly volume of power traded in bilateral markets did not have any material changes in May, both for on-peak or off-peak



LMP decomposition prior to EDAM/DAME implementation

- Two types of power balance constraints were enforced in WEIM
 - System PBC defined across WEIM footprint (λ)
 - BAA-specific PBC defined for each individual WEIM BAA except CISO (λ_j)
- MEC: SMEC (λ) shared by all WEIM BAAs
- MCC: BAA-specific PBC shadow price (λ_j) + congestion on flowgates/nomograms/etc

LMP Decomposition for Non-CISO EIM Resource

$$\left. \begin{aligned}
 SMEC &= \lambda \\
 MLC_i &= (\lambda + \lambda_j - \psi) \left(\frac{1}{LRF_i} - 1 \right) \\
 MCC_i &= \lambda_j - \sum_m \sum_{n \in N_m} a_{m,n} SF_{m,n,i} \mu_m \\
 MGC_i &= -\psi
 \end{aligned} \right\}, \quad \forall i \in BAA_j \wedge j \in EIM \wedge j > 0$$

MCC decomposition prior to EDAM/DAME implementation

- BAA-specific PBC shadow price (λ_j) was a component of MCC
- $\lambda_j = \varphi_j + v_j$ or $\lambda_j = \varphi_j + \xi_j$
 - Shadow price of EIM Transfer Distribution Constraint (φ_j)
 - Shadow price of EIM Transfer Scheduling Limit (v_j or ξ_j)

WEIM Transfer Constraints

2.4. EIM Transfer Distribution Constraints

These constraints distribute the EIM transfer of each BAA in the EIM Area to the energy transfer schedules on the associated interties:

$$t_j(\mathbf{x}) \equiv T_j - \sum_{\substack{k \in EIM \\ k \neq j}} \sum_{l \in L_{j,k}} (ET_{j,k,l} - ET_{k,j,l}) = 0, \quad \forall j \in EIM \quad \varphi_j$$

2.5. EIM Transfer Scheduling Limits

The EIM transfer scheduling limit constraints are as follows:

$$T_j \leq T_j \leq \bar{T}_j, \quad \forall j \in EIM \quad v_j \text{ or } \xi_j$$

LMP decomposition after EDAM/DAME implementation

- MEC & MCC re-formulated for both day-ahead and real-time
- System-wide PBC no longer enforced; no more SMEC (λ)
- MEC is now BAA-specific (λ_j) and contains transfer constraint shadow prices: $\lambda_j = \varphi_j + v_j$ or $\lambda_j = \varphi_j + \xi_j$
- MCC now only reflects congestion on flowgates/nomograms

Comparison of MEC/MCC Before & After 5/1/2026

Before 5/1/2026		5/1/2026 - Present	
SMEC Components	MCC Components	MEC Components	MCC Components
	ϕ_j	ϕ_j	μ_j
	v_j	v_j	
	ξ_j	ξ_j	
	μ_j		

Note: μ_j denotes shadow price of transmission constraint (e.g., flowgate, nomogram)

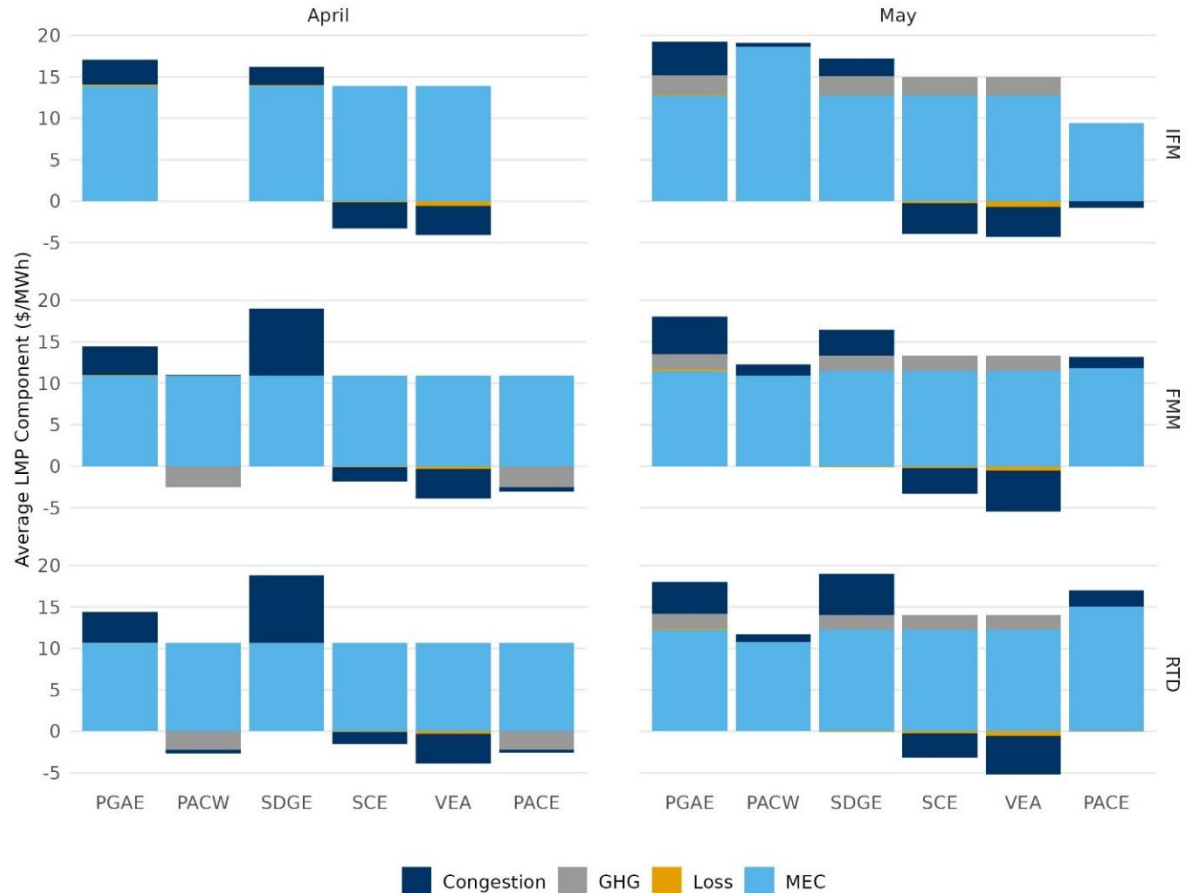
Aside from price formation changes, EDAM had no significant impact on the LMPs composition

Before EDAM,

- System-level MEC (SMEC)
- GHG costs imbedded in SMEC and subtracted from non-California BAAs

With EDAM,

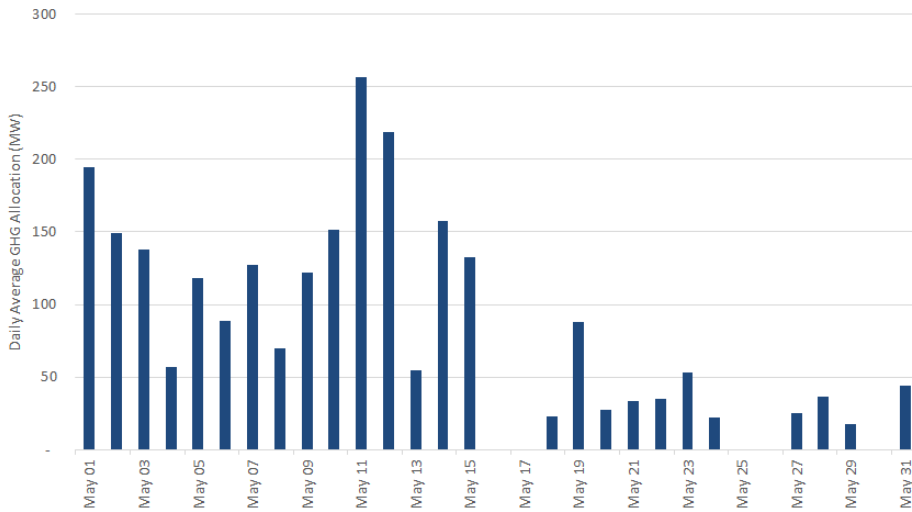
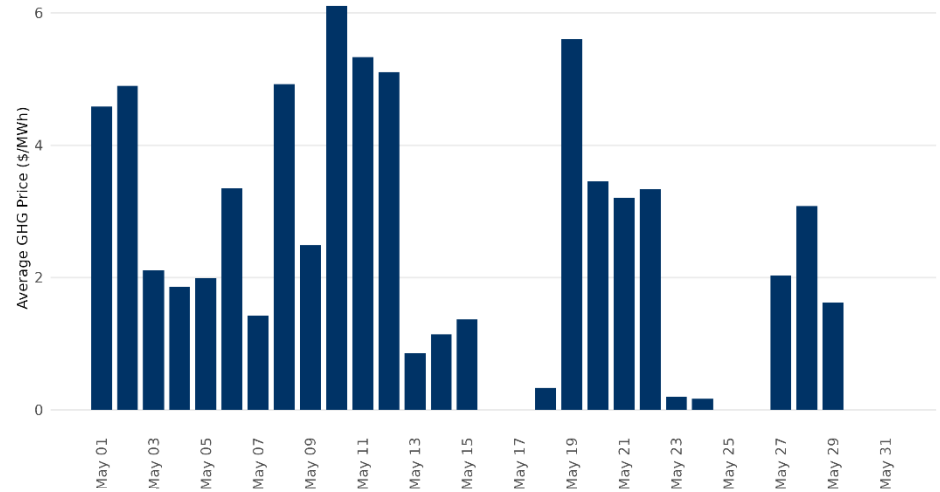
- MEC is calculated for each BAA
- GHG costs added only for GHG regulation areas



Increased real-time congestion in PACE and PACW from April to May is consistent with prior years

Daily average Greenhouse gas allocation reached a maximum of 256 MW on May 11

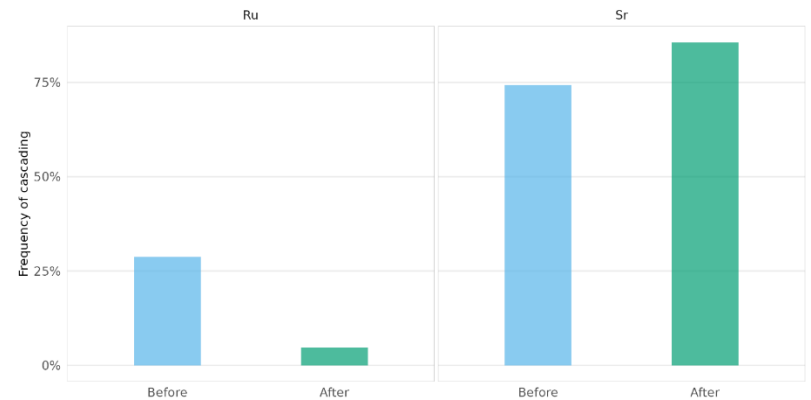
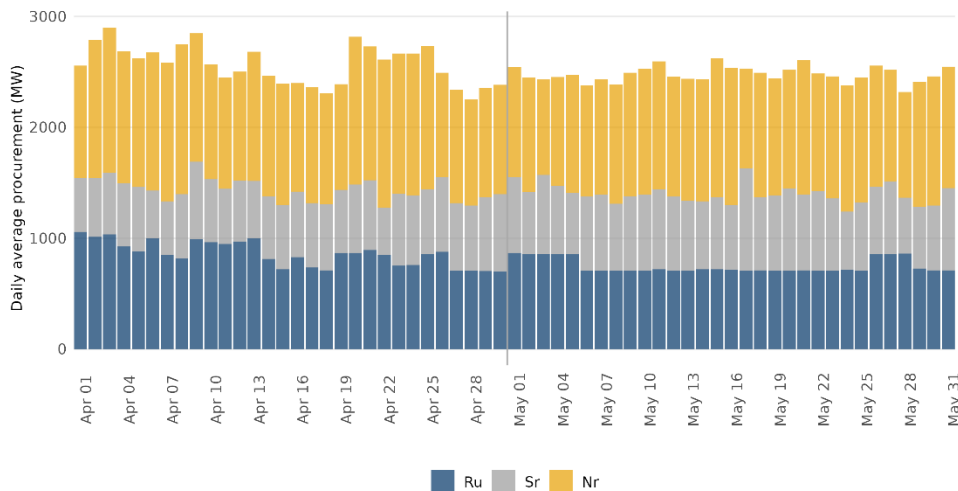
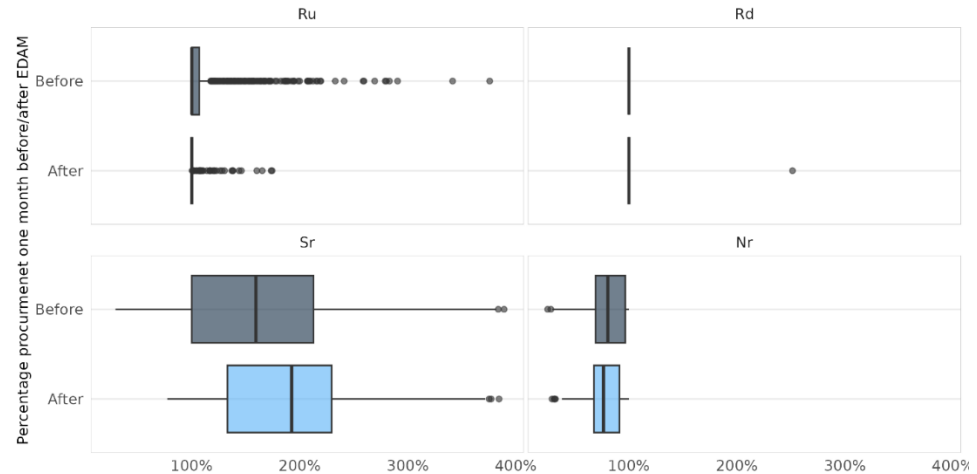
- GHG prices were moderate, around \$ 3 – 4/MWh during the first half of the month



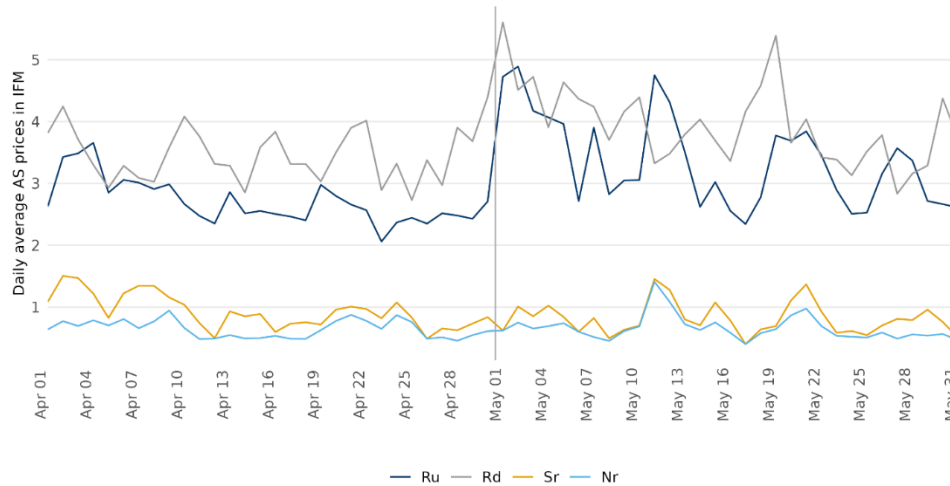
GHG allocation was higher during the first half of the month

With the launch of EDAM/DAME, the frequency of AS cascading reduced

- The frequency of cascading in regulation up decreased from 28.8% in April to 4.7% in May.
- The frequency of cascading in spin increased from 74.3% in April to 85.6% in May

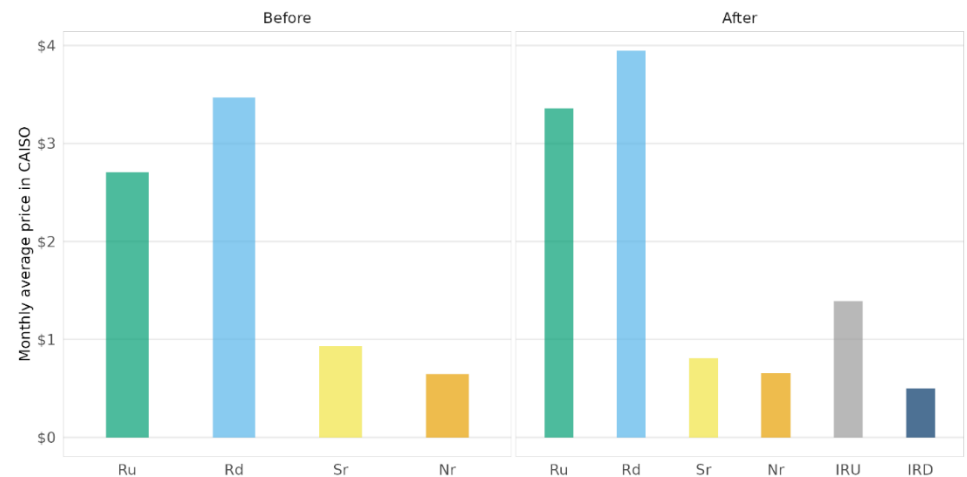


AS prices remained within typical ranges for all commodities in May.

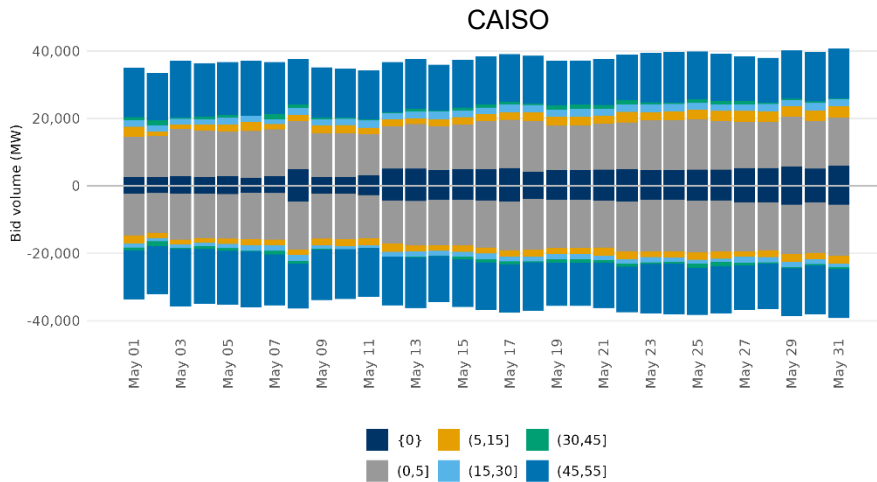


Average regulation up and down prices showed slight increase while Spin and Non-spin prices remained in similar ranges

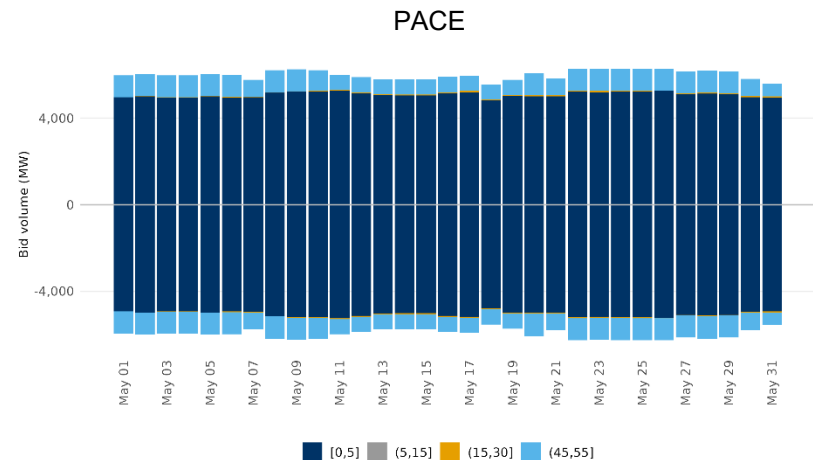
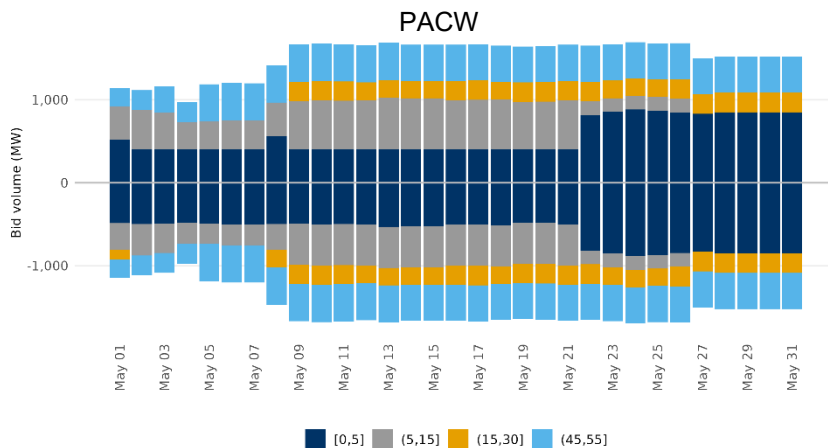
Average IRU price 1.4\$/MWh fell between average prices of 3.4\$/MWh for regulation up and 0.8\$/MWh for spin



The bid volume of imbalance reserves remained stable with few variations in May depending on the area



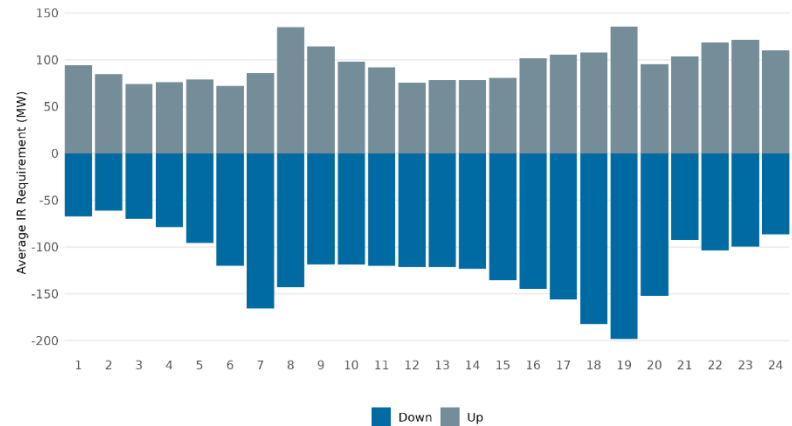
In the ISO and PACE area, the daily average bid volume and price ranges for imbalance reserve remained stable in May



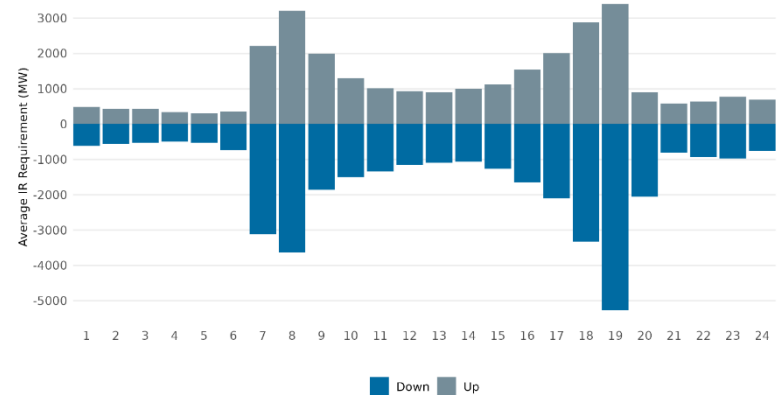
Imbalance reserve prices have been moderate

- Requirement levels vary according to the applicable area size
- Prices follow the pattern of higher requirements in the morning and evening peaks

IR requirements for PACW



IR requirements for CAISO

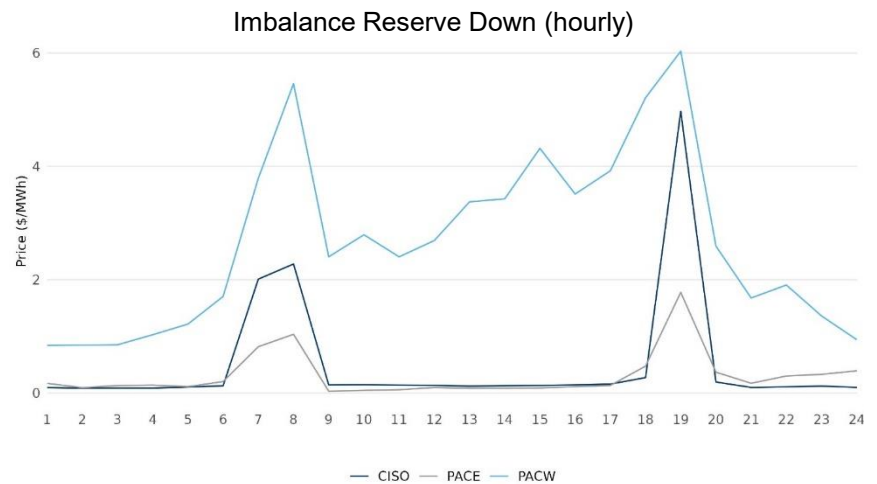
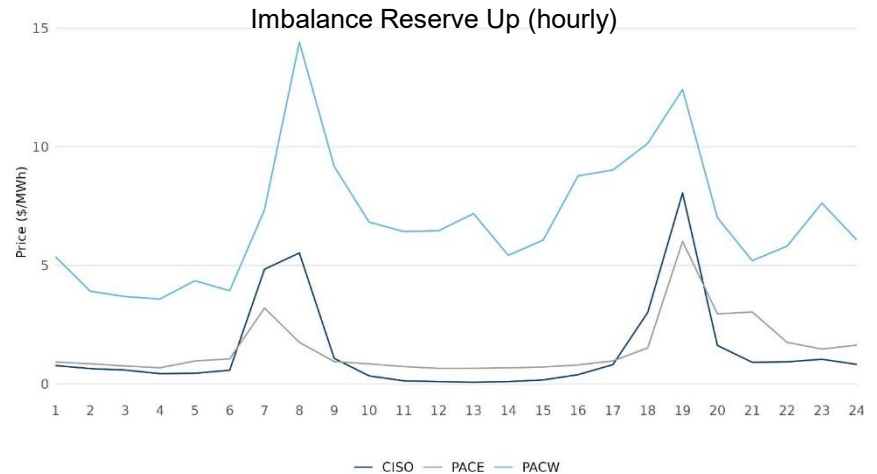
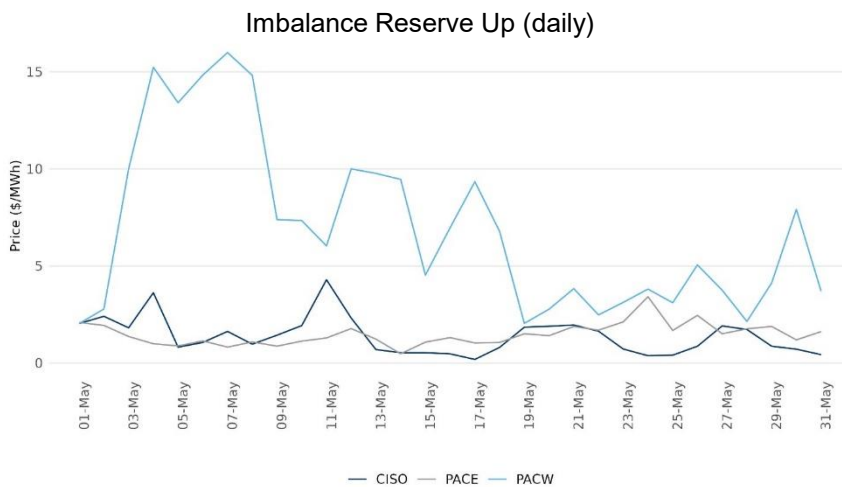


IRU prices

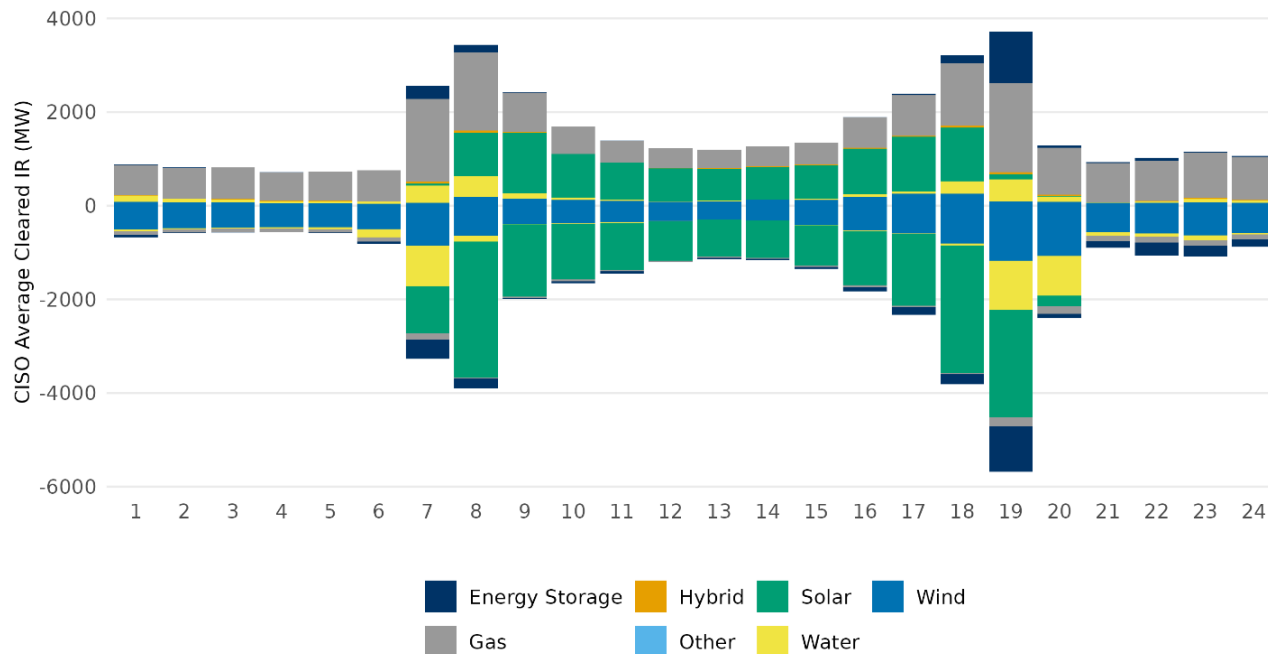


Imbalance reserve up prices were higher than imbalance reserve down

- Prices were volatile in the days after EDAM launch, then stabilized
- Prices show regional differences, reflecting the economics of each area



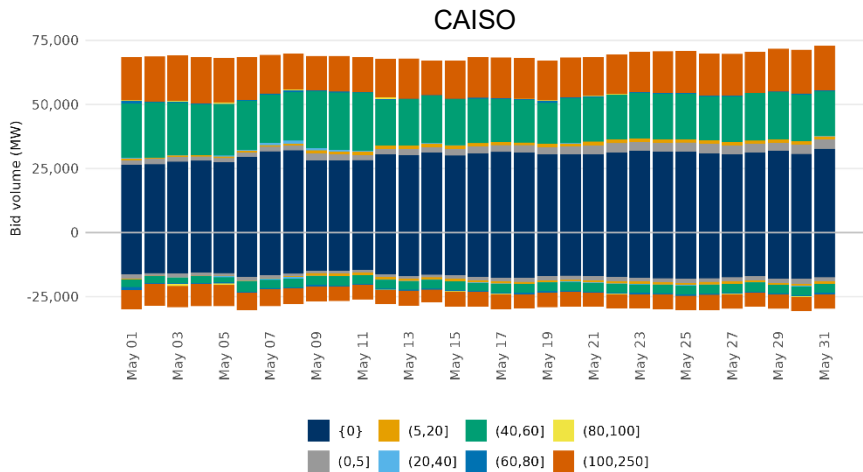
The procurement of imbalance reserves was fulfilled by a different supply mix depending on the area



In the ISO area, gas followed by solar was the primary supply supporting imbalance reserves. Storage resource provide minimal capacity in peak hours.

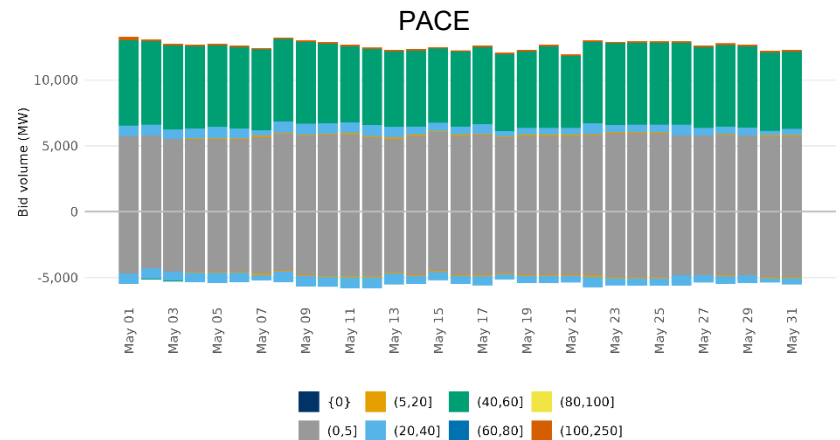
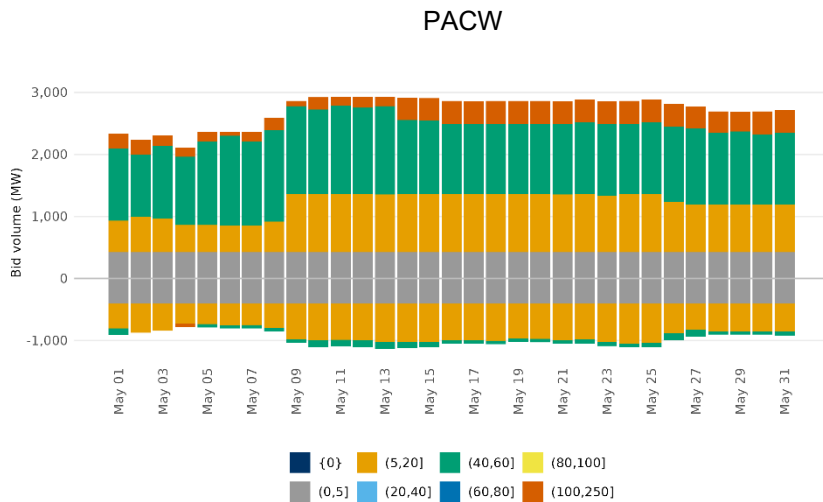
In the PACE area, coal complemented with transfers were the main sources of imbalance reserves, while PACW was mainly supported by transfers and hydro.

The bid volume of reliability capacity remained stable with few variations in May depending on the area



The volume of supply for upward and downward capacity is asymmetrical

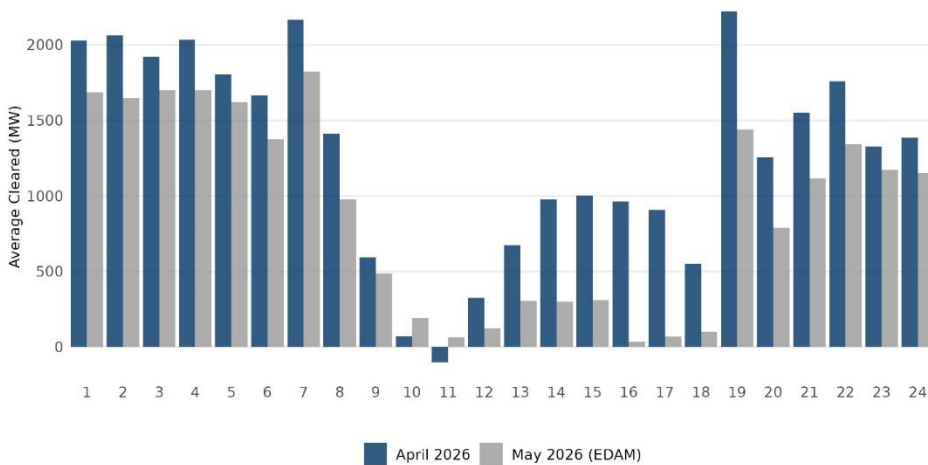
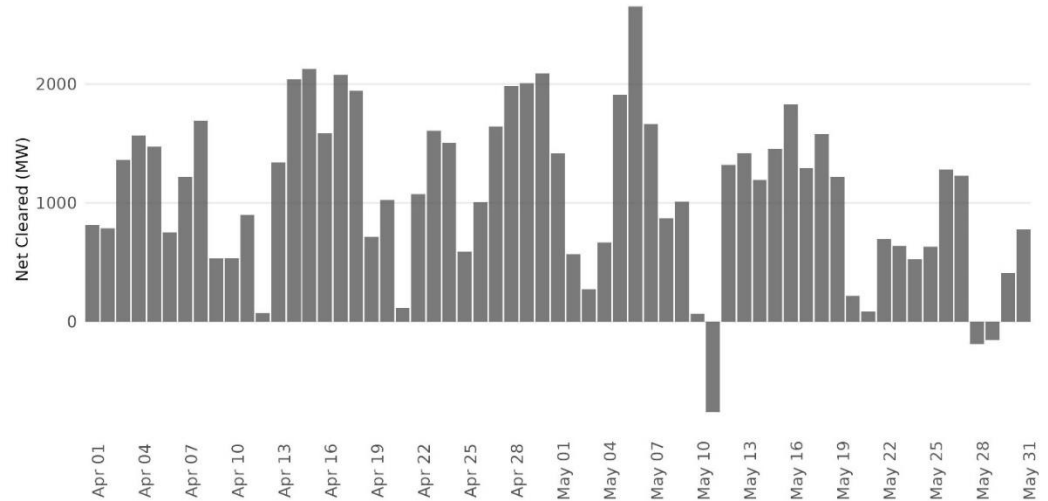
These volumes reflect only availability, but it is up to the optimization to determine the optimal procurement



EDAM had no noticeable impacts on convergence bidding in CAISO

Net virtual bids =
virtual gen – virtual load

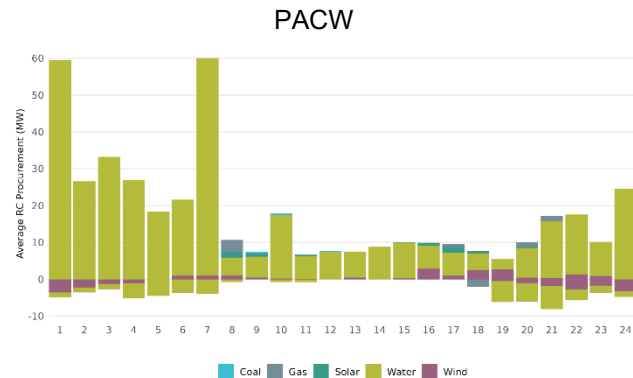
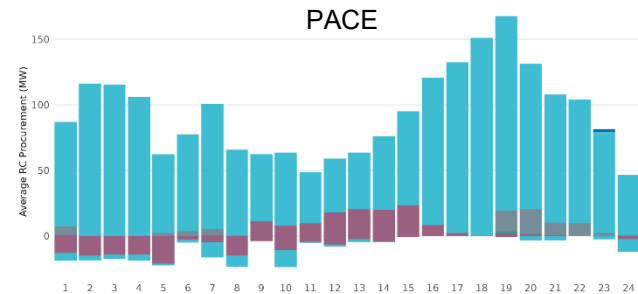
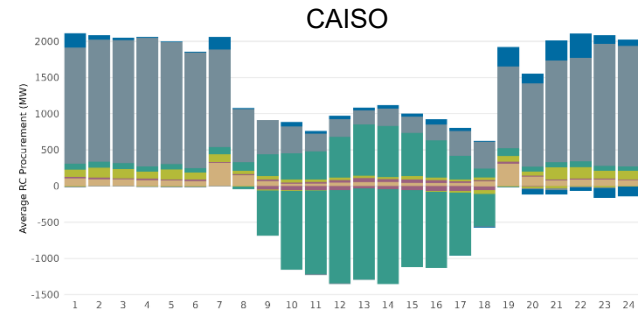
No significant change in net cleared virtual bids convergence bidding trends after May 1st



Changes in the average hourly profile of net cleared virtual bids are consistent with changes in April and May 2025

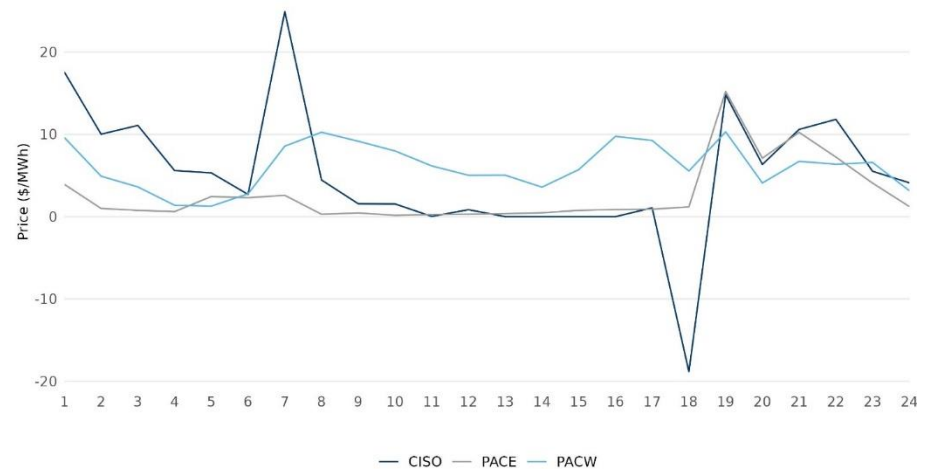
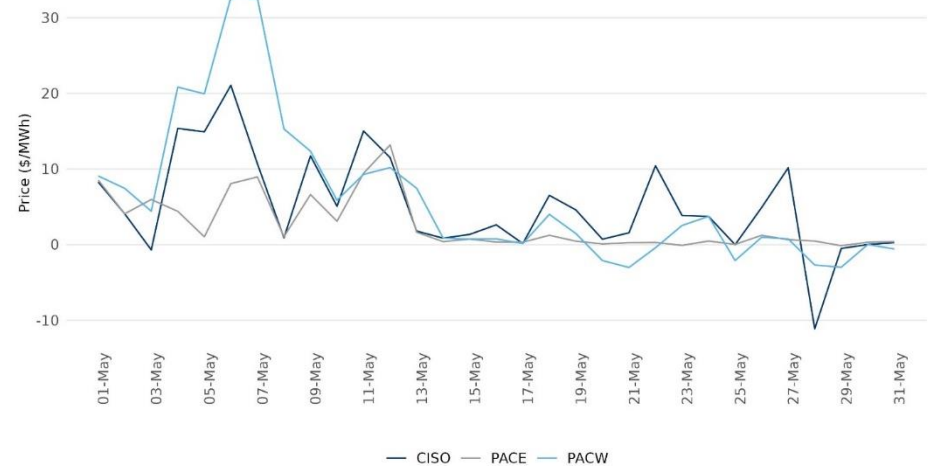
The level of reliability capacity procured varies largely by area given their corresponding size

- Reliability capacity is procured for the difference between the area's load forecast and physical supply cleared in the IFM
- Underbidding of demand in IFM market leads to higher upward capacity procurement. Most of the procurement cleared in May is for upward direction

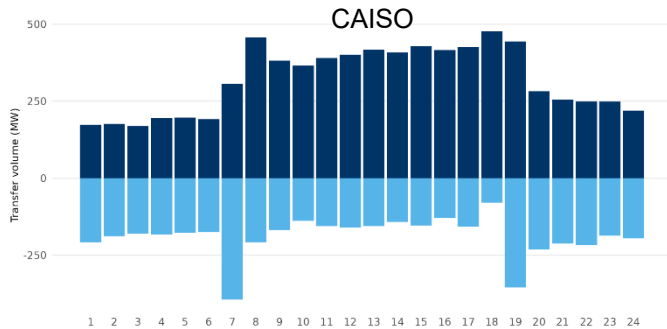


Procurement and prices for reliability capacity have trended down after the first days of operation

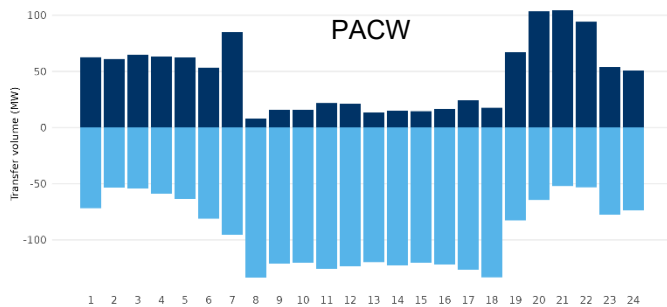
- Like energy, reliability capacity prices exhibit regional price separation
- Reliability capacity prices trend lower than energy prices
- Prices are close to zero most of the time and may rise to about \$55 under tighter supply conditions



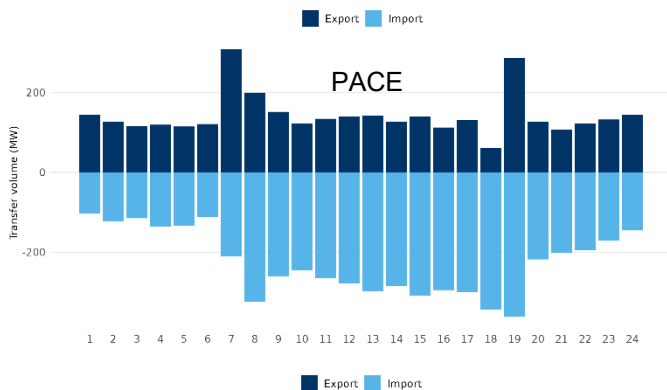
Transfer capability available among areas is enabling the economics of the larger market footprint



The ISO exported more energy in the daylight hours and imported more in morning and evening ramping hours



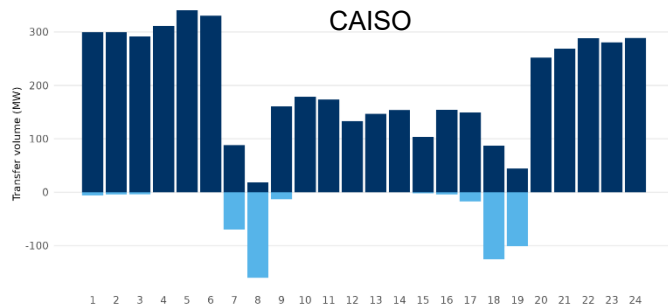
The PACW exported more energy in night hours and imported more in daylight hours



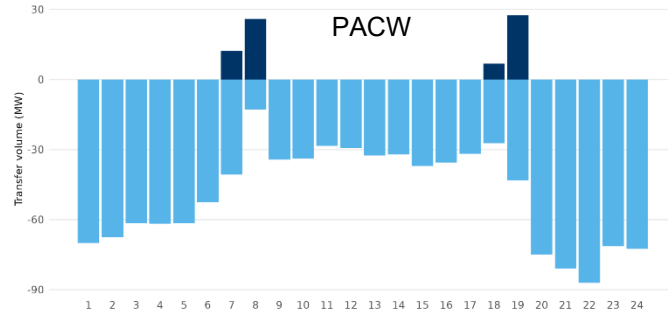
The PACE exported more energy in morning and evening ramping hours and imported more in daylight hours

Imports (-)
Exports (+)

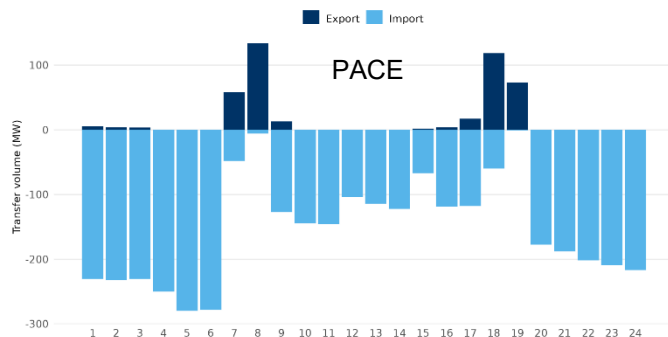
The EDAM is also finding economic transfers for imbalance reserves for both directions



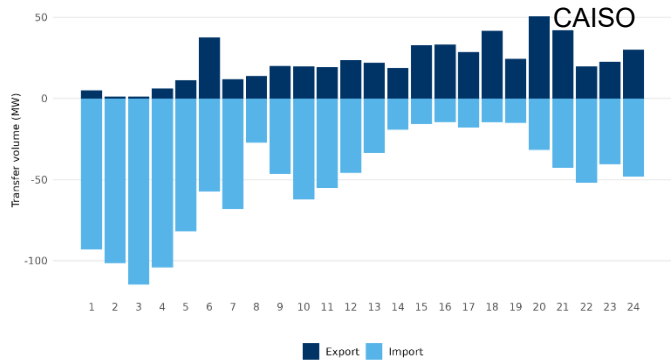
The ISO exported (+) imbalance reserves up in most hours and only imported (-) some in morning and evening ramping hours



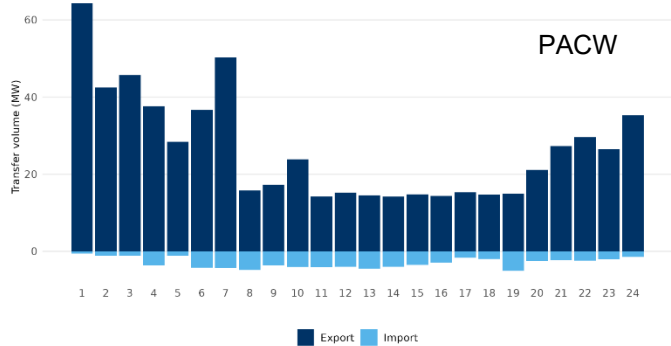
The PACW and PACE imported imbalance reserves up from the ISO in most hours and exported some morning and evening ramping hours



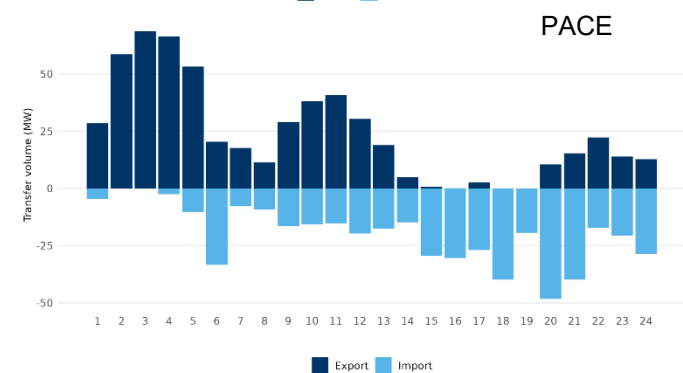
The EDAM also realized economic transfers for reliability capacity



The ISO imported (-) more reliability capacity up in most hours while exported more in afternoon and evening ramping hours



The PACW imported imbalance reserves down in most hours

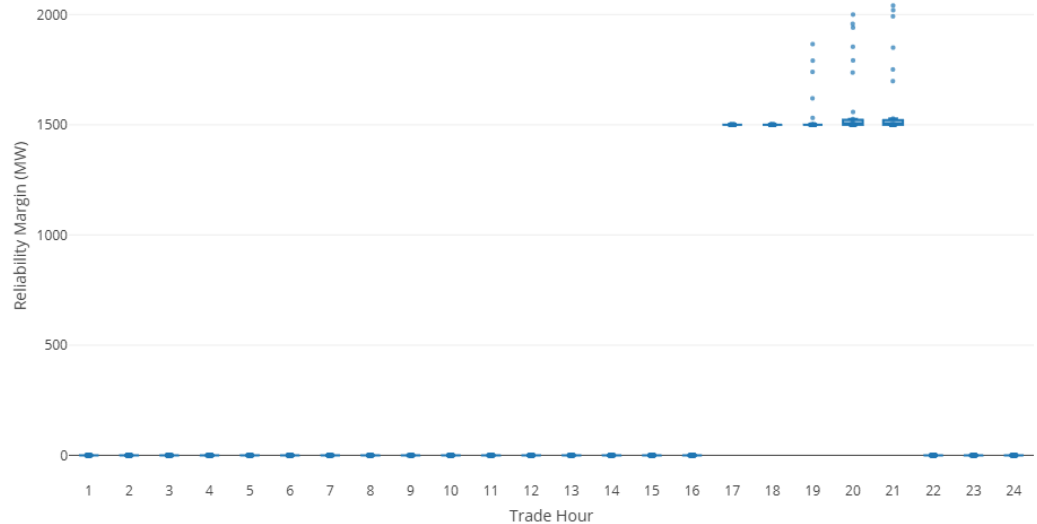


The PACE was a net exporter during the first half of the day and a net importer during the remaining hours

EDAM net export constraint enforced on all days for CAISO area only

- The net export constraint is an optional tool for BAAs to limit their net transfer exports to their excess RSE-eligible capacity
- The constraint can be further tuned using a confidence factor for non-RSE eligible capacity and an additional reliability margin

CAISO Reliability Margin, May 2026



The CAISO reliability margin is set based on the most severe single contingency

No RUC load adjustments were applied for any BAA in May 2026

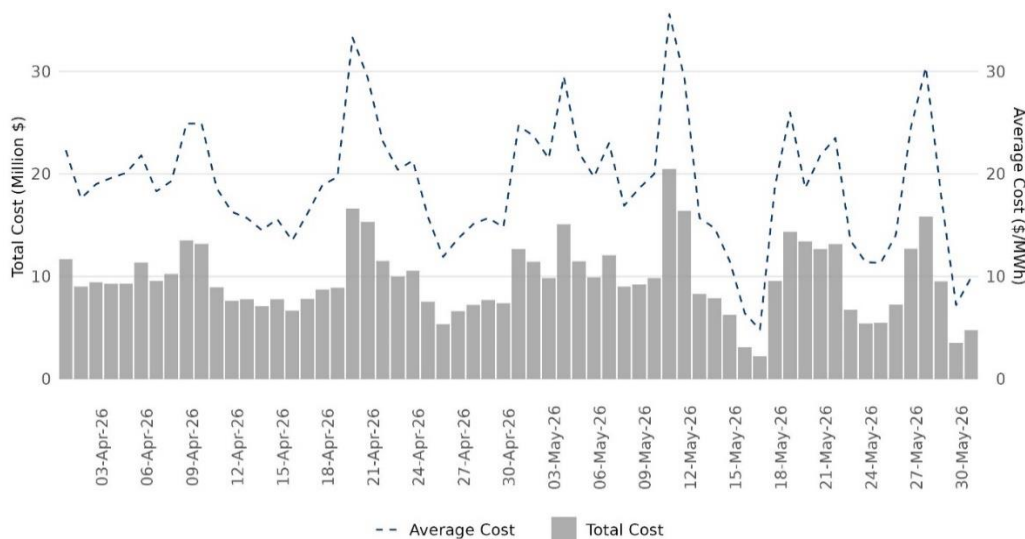
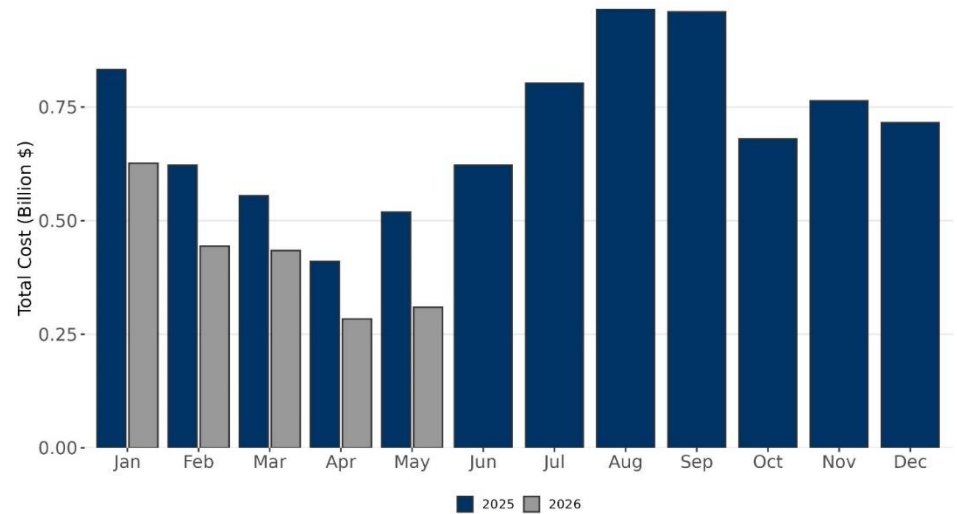
- RUC load adjustments are an optional adder to the load forecast in RUC to capture any additional operational concerns that may not be captured through the market
- The CAISO has laid out the conditions under which it will use the RUC load adjustments in the EDAM BPM based on the load forecast, cleared imbalance reserves, and other operational concerns
- No RUC load adjustments were applied in May for any BAA

Settlements data such as costs are derived from the first T+9BD cycle and is subject to adjustments

- The ISO is actively investigating several issues and disputes that may affect different settlements components as reflected in the T+9 calculations
- As these reviews are taking place, the ISO has and will continue to implement corrections and adjustments as needed
- These will be reflected in subsequent settlement recalculations, including at the T+70 true-up and future T+9 calculations
- The metrics provided in this monthly report about different costs are preliminary and subject to change
- Price corrections implemented within the 10BD window may not be reflected in this preliminary costs information

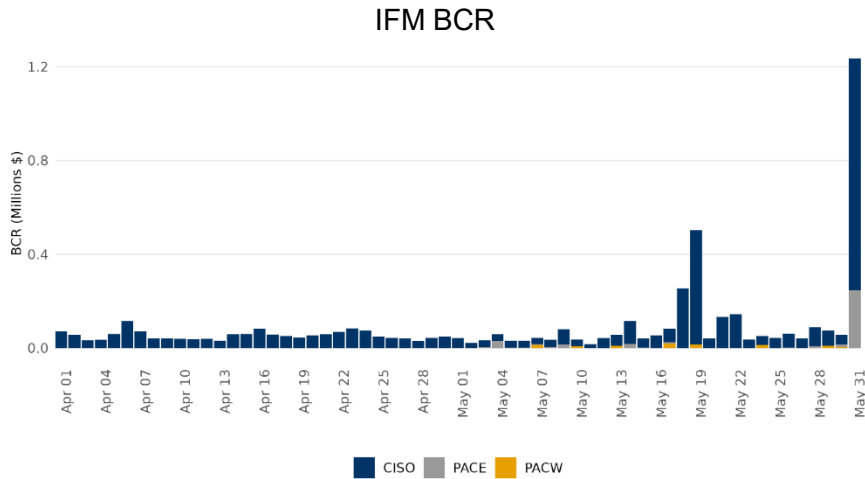
CAISO total market costs continue to follow seasonal and longer-term trends with no significant impact from EDAM

- April and May are typically the lowest-cost months
- Costs in 2026 have been relatively low

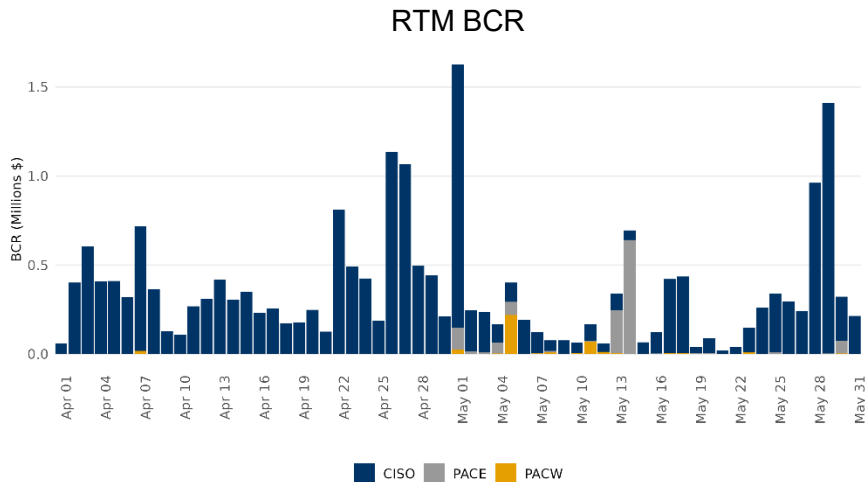


This metric includes cost for energy and AS from both day-ahead and real time markets, bid cost recovery, offsets and now the cost of imbalance reserves and reliability capacity

IFM BCR increased from \$1.64 million in April to \$3.15 million in May for CAISO area



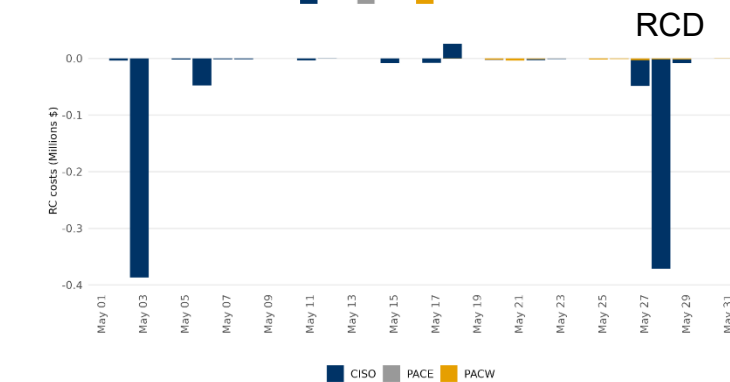
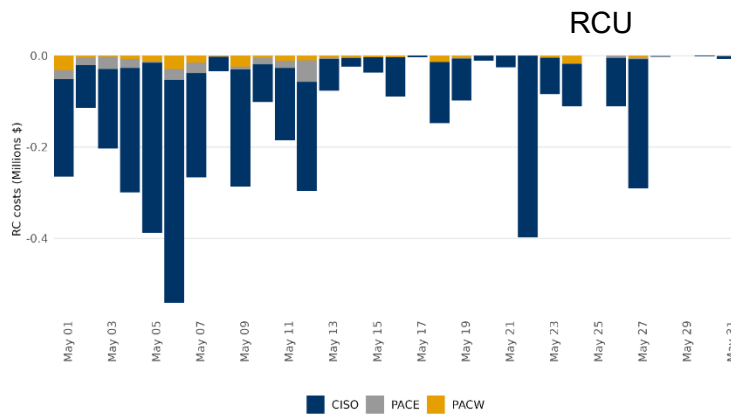
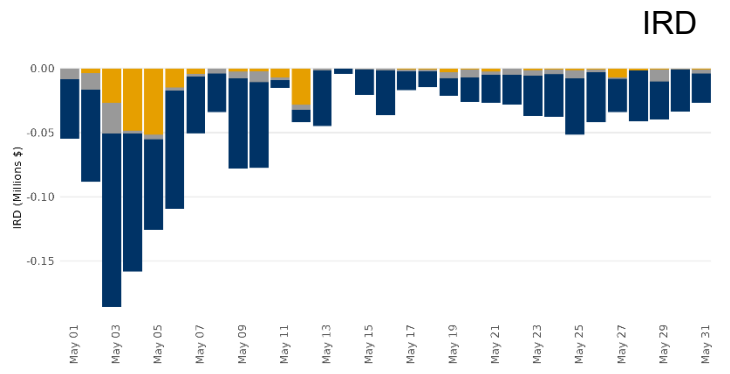
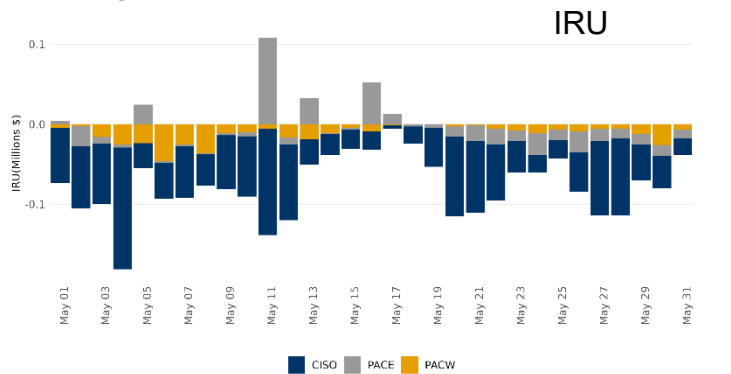
BCR (Million \$)	IFM		RTM	
	Apr	May	Apr	May
CISO	1.64	3.15	11.65	8.24
PACE	-	0.36	0.0011	1.28
PACW	-	0.097	0.019	0.4



Data issues identified to impact the following trade dates:

- IFM BCR: May 19th and 31st
- RTM BCR: May 1st and 29th

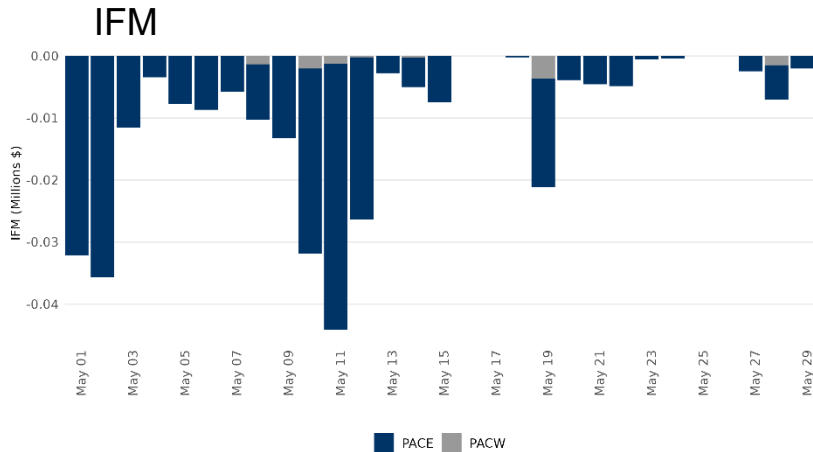
Procurement cost of Imbalance Reserves and Reliability Capacity



IR & RC settlement costs in May (million \$)	IRU	IRD	RCU	RCD
CISO	1.79	1.25	4.05	0.86
PACW	-0.365	0.21	0.21	0.019
PACE	0.03	0.135	0.23	0.002

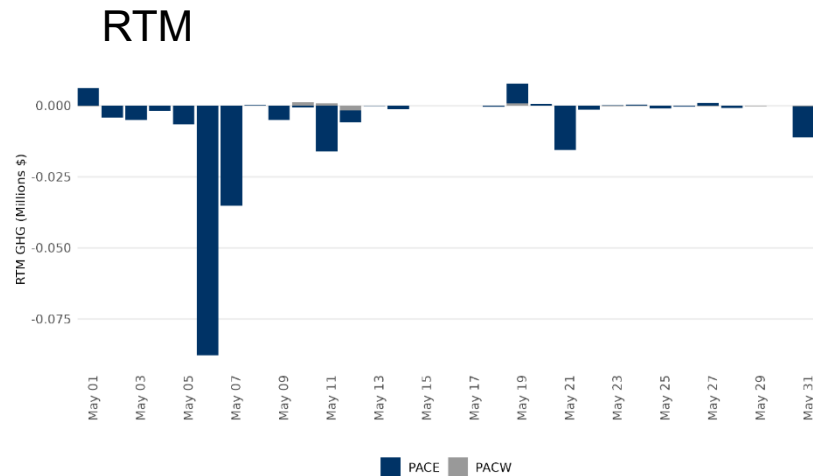
PACE has five days with positive settlement values. These are days impacted by data and calculation issues currently being addressed.

GHG settlement is now performed for both day-ahead and real-time markets

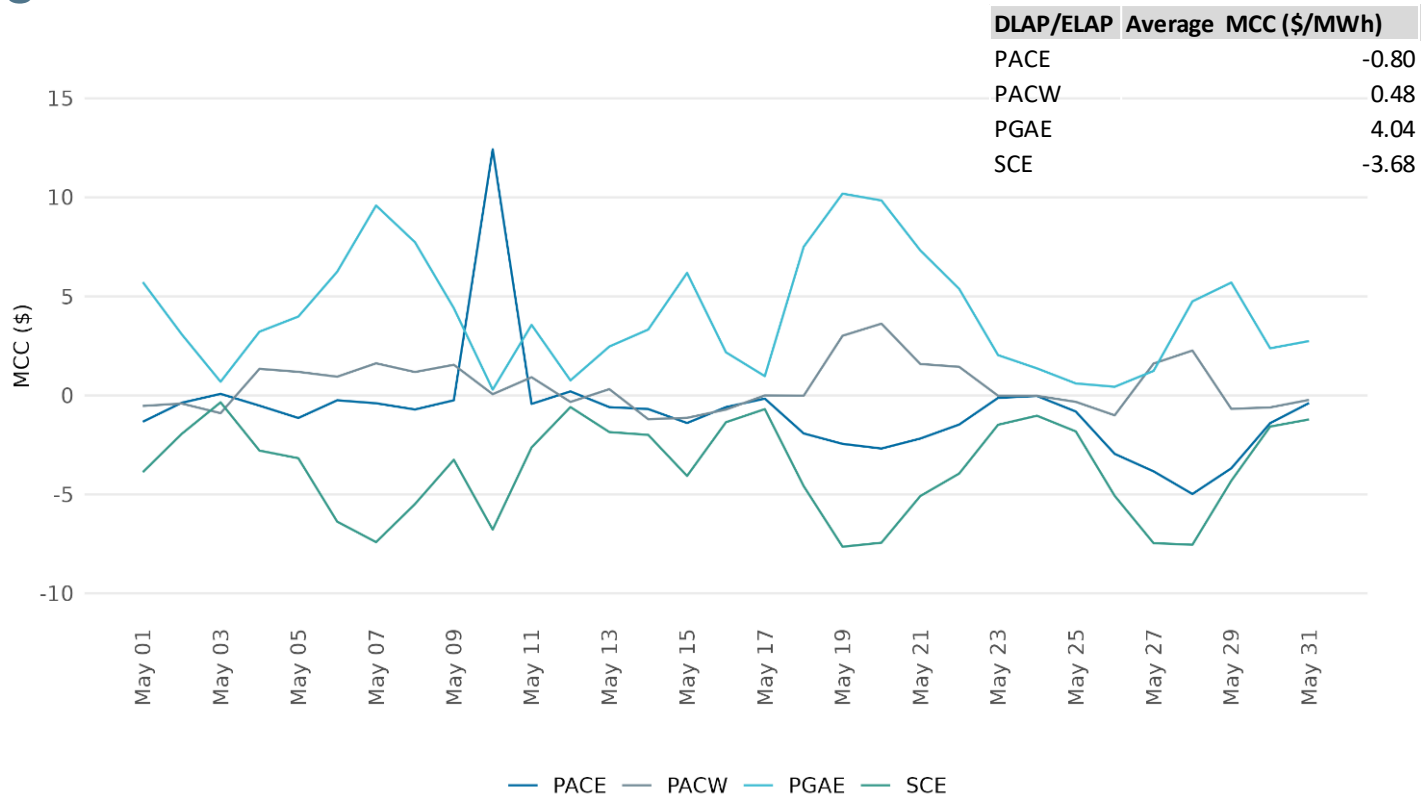


Negative values indicate a payment to the Scheduling Coordinator and positive values, which will only occur in RTM, indicate a buyback amount

In the IFM market, PACE and PACW received payments of \$0.283 million and \$0.01 million, respectively. In RTM, PACE received a payment of \$0.182 million, while PACW had a charge in RTM of \$555.



EDAM congestion had low impacts on PACE and PACW LMPs



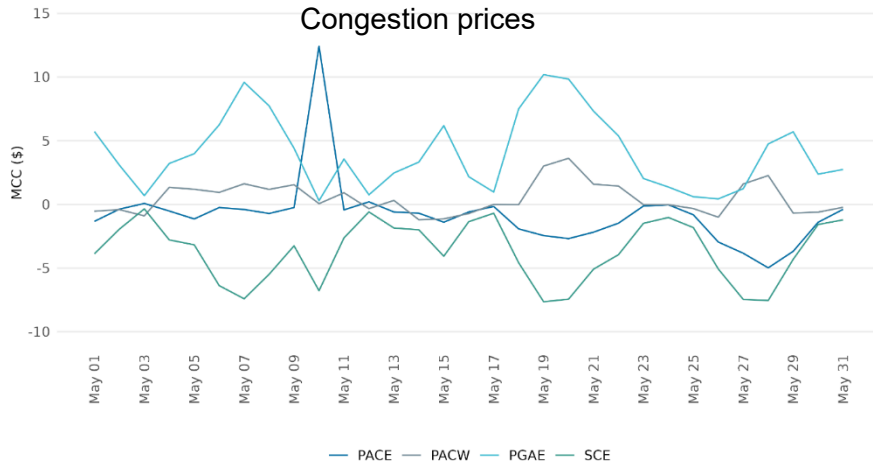
- Congestion prices at PACW closely tracked those in Northern California
- Congestion prices for PACE were generally negative, mirroring congestion patterns in Southern California
- The magnitude of congestion observed at PACW and PACE was considerably lower than that seen within the CAISO area

Congestion from transmission constraints across energy and Imbalance reserves show in the areas MCCs

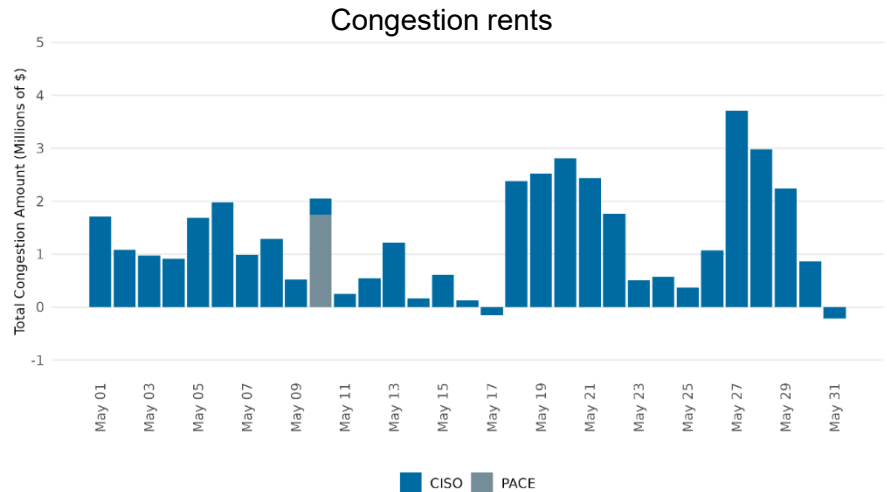
Congestion Price Impact (\$/MWh)				
Source of Congestion	PACE	PACW	PGAE	SCE
CISO	-0.62	0.80	4.12	-3.00
Base	-0.60	0.74	3.92	-2.84
IRD	-0.01	-0.02	0.08	-0.05
IRU	-0.01	0.07	0.12	-0.10
PACE	0.42		-0.06	-0.18
Base	0.41		-0.06	-0.17
IRD	0.00		0.00	0.00
IRU	0.01		0.00	0.00

- PACE constraints on average impacted PGAE by -\$0.06 and SCE by -\$0.18
- There was no PACW congestion in May
- The most significant congestion impact was realized from CAISO constraints on CAISO areas (internal flows)

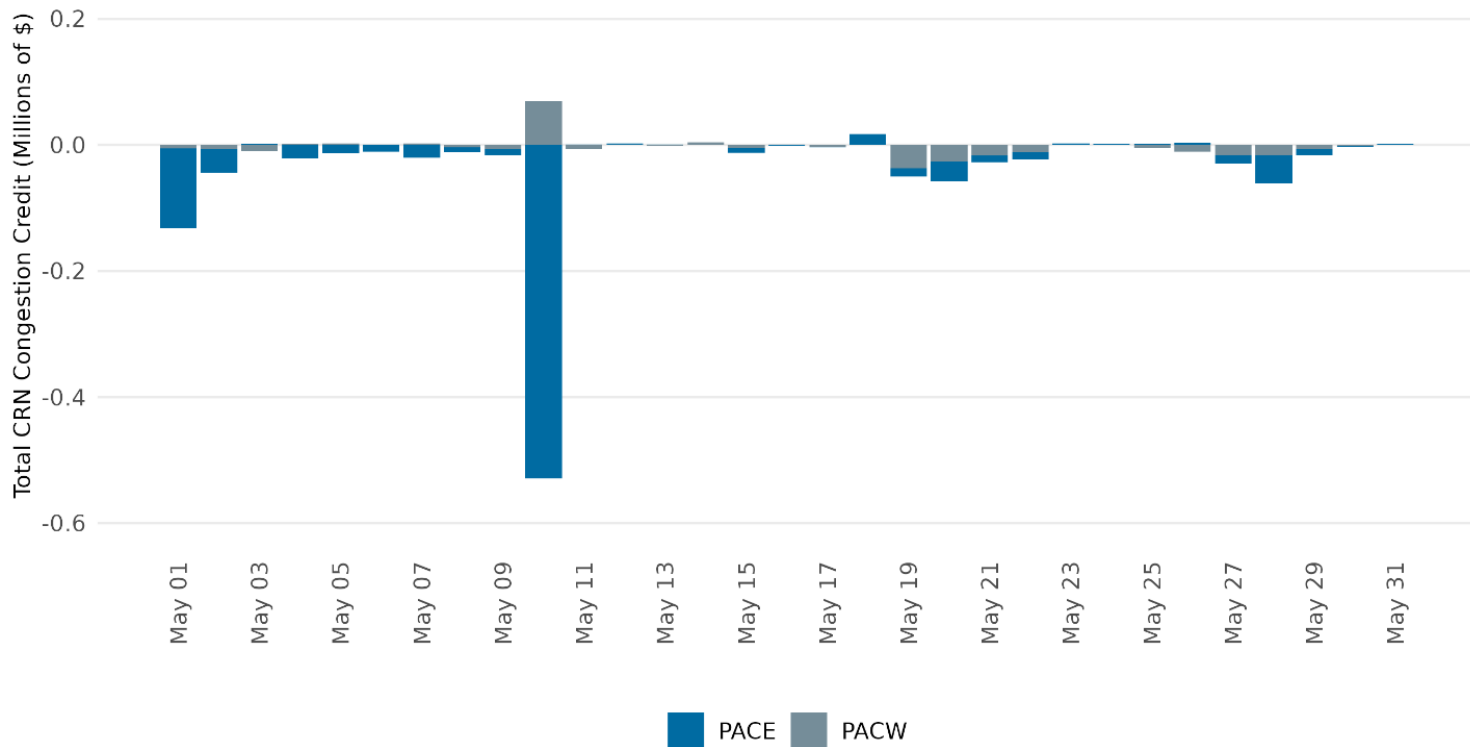
Over 95 percent of congestion revenues in May were collected from congestion sourced in the CAISO area



Total EDAM congestion revenues in May were \$39.9M, with \$38.2M sourced from the CAISO BAA and \$1.7M from PACE



Congestion revenue allocation related to parallel flows across EDAM balancing authority areas and PAC own congestion were relatively low



The ISO is tracking several EDAM Market Issues

Several of the items listed in this section have been previously introduced and discussed in ISO calls (implementation, market update or settlements group). The ISO will continue to address the resolution of these issues as necessary.

- **Negative RCD Prices:** Negative prices for RC awards have been observed due to several factors, including software issues with MSG transitions, market-driven conditions related to optimality of solution and price formation. Status: on-going
- **Invalid ITC and ISL congestion shadow prices:** The constraints did not properly account for multiple commodities, including A/S, IR and RC. Status: Fixed May 19
- **Negative Flex Ramp Product prices:** Incorrect low WEIM pool requirements for FRP lead to negative FRP prices. Status: Fixed May 4

The ISO is tracking several EDAM Market Issues

- GHG Pricing issue: Real-time GHG prices were affected by an inconsistency in the GHG area composition. On May 1-2, 2026, prices were impacted by a misalignment between BAA and GHG area definitions, with the GHG area generally encompassing more demand than the BAA area. Status: Fixed May 3
- Infeasible Solar RCU Awards: A logic issue from the interaction between VER forecasts and Pmin re-rates resulted in infeasible RCU awards to solar resources. Status: on-going
- In RUC when RCU and RCD bid prices are \$0, the optimization may procure both RCU and RCD in the same hour. This is not a logic issue but reflects an interplay with \$0 bids. CAISO will continue monitoring to ensure the new market functionality is working as intended.

The ISO is tracking several EDAM Market Issues

- **High IR Settlement Charges:** Elevated IR charges occurred due to missing data. A software defect in the post-processing systems caused missing records for MSG Resources, resulting in incorrect quantities for IR. Status: Fixed May 20
- **Missing Shift Factors in the Market Participant Portal and CRR System:** Complete shift factor data is not available in the MPP due to missing values in the payload transmitted from the market application. The CRR settlement system is also missing shift factors related to the IRU and IRD deployment scenarios. Status: on-going
- **Storage Resources and RCD:** Due to a logic issue, storage resources are unable to provide RCD despite being economic and having sufficient state-of-charge headroom. Status: on-going

The ISO is tracking several EDAM Market Issues

- Self-Schedule Penalty Prices impacting BCR: The day-ahead BCR mechanism is incorrectly including penalty prices of self-schedules into the bid cost calculations resulting in high BCR. Status: Fixed June 7
- Flow Discrepancies for Intertie Constraints in the CRR system: When interties are mapped to multiple Intertie Constraints, the IFM flow calculation logic produces inaccurate results, leading to downstream misallocation of CRR revenues. Status: on-going
- High BCR due to negative bid processing: The IFM BCR was high on May 31 due to processing negatively-priced bids where the bid costs are being set to zero. Status: Ongoing