



California ISO

Market Performance and Planning Forum

June 11, 2018

ISO PUBLIC

Objective: Enable dialogue on implementation planning and market performance issues

- Review key market performance topics
- Share updates to 2018 release plans, resulting from stakeholders inputs
- Provide information on specific initiatives
 - to support Market Participants in budget and resource planning
- Focus on implementation planning; not on policy
- Clarify implementation timelines
- Discuss external impacts of implementation plans
- Launch joint implementation planning process



Market Performance and Planning Forum

Agenda – June 11, 2018

Time:	Topic:	Presenter:
10:00 – 10:05	Introduction, Agenda	Kristina Osborne
10:05 – 12:00	Solar Cessation Market Performance and Quality Update	John Phipps Guillermo Bautista Alderete Amber Motley
12:00 – 1:00	Lunch	
1:00 – 1:30	Policy Update	Brad Cooper Jill Powers
1:30 – 2:30	Release Update	Adrian Chiosea Janet Morris

Solar Cessation

Historical Background

- The ISO temporarily adjusted its operating protocol to procure more operating reserves minimizing the potential impact due to loss of inverter power injection during a single transmission contingency event.
- For TD of June 14, 2017, total operating reserve procurement target was set to the maximum of NERC/WECC required operating reserves or up to 25% of the total solar production forecast.
- For TD of Sep 19, 2017, total operating reserve procurement target was set to the maximum of NERC/WECC required operating reserves or up to 15% of the total solar production forecast.

Industry Update on Inverter Cessation

- [NERC Alert](#) on June 20, 2017
- [NERC Alert](#) on May 1, 2018

Each of the NERC Alert includes documentation of the disturbance report available to public

CAISO Proposal

- CAISO will continue to procure more operating reserves to minimize the potential impact due to loss of inverter power injection during a single transmission contingency event.
- Total operating reserve procurement target will continue to be set to the maximum of NERC/WECC required operating reserves or up to 15% of the total solar production forecast.
- CAISO will start PRR to modify BPM for Market Operations to document the above stated practice
- CAISO will update Operating Procedure 1340 (Day Ahead AS Procurement and Availability Validation) and Operating Procedure 2340 (Real Time AS Procurement)

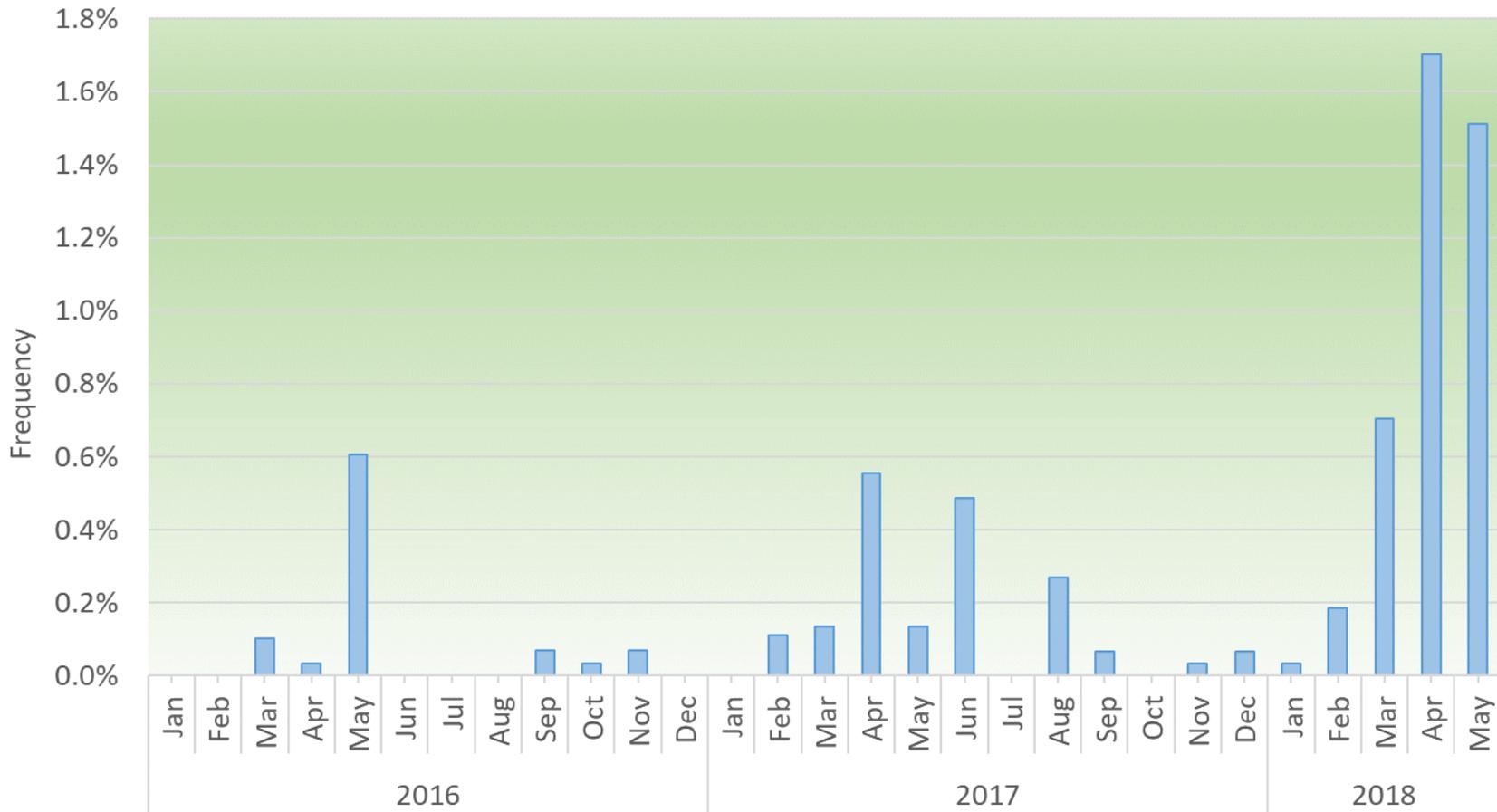
Market Update

Amber Motley
Manager, Short-term Forecasting

Guillermo Bautista Alderete, Ph.D.
Director, Market Analysis and Forecasting

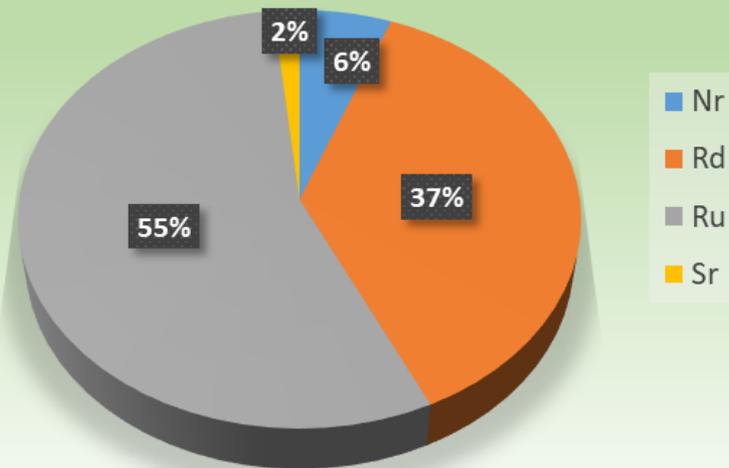
Ancillary Service Scarcity Events

The real-time market has observed an increase in AS scarcities in 2018

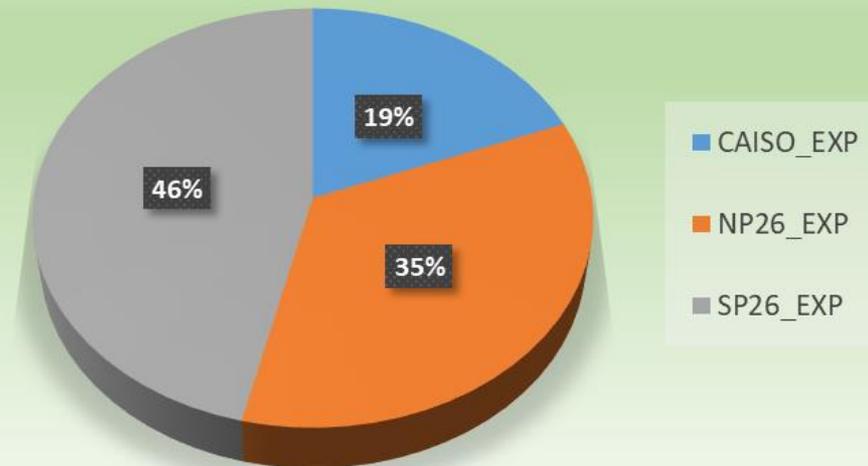


AS scarcities have increased in 2018 due to a confluence of factors

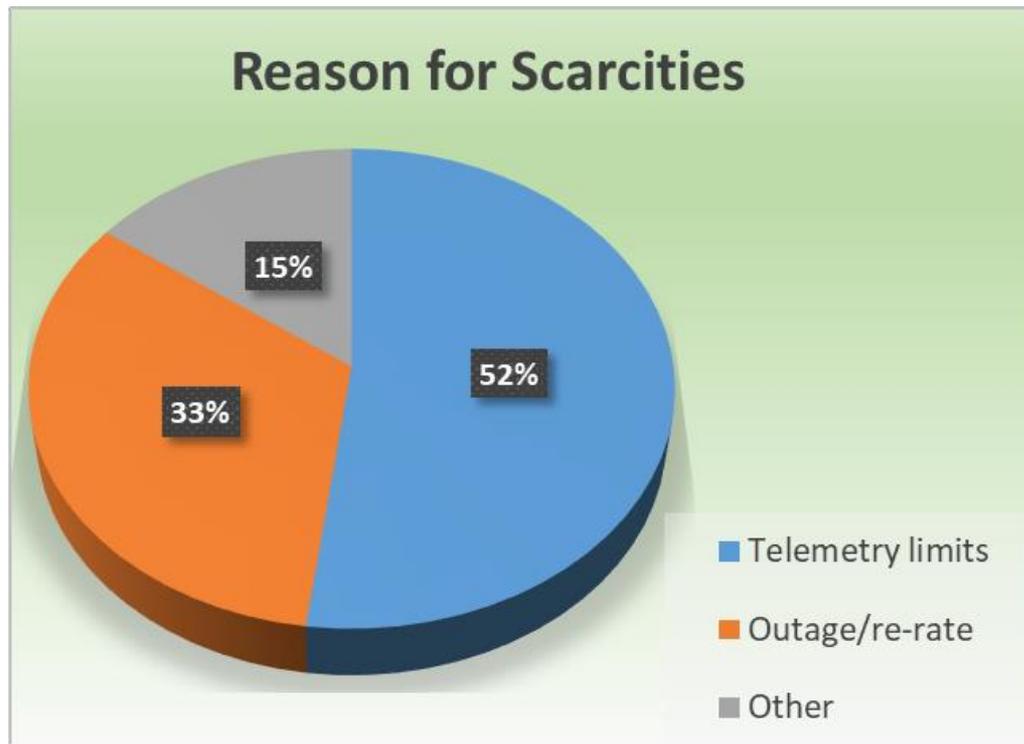
Product with Scarcities



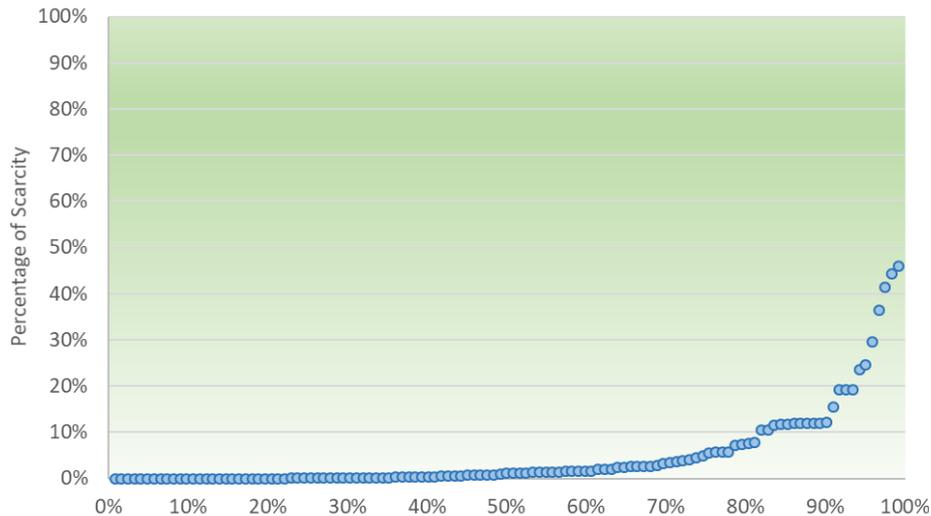
Regions with Scarcities



The majority of instances in 2018 are driven by changes observed in real-time

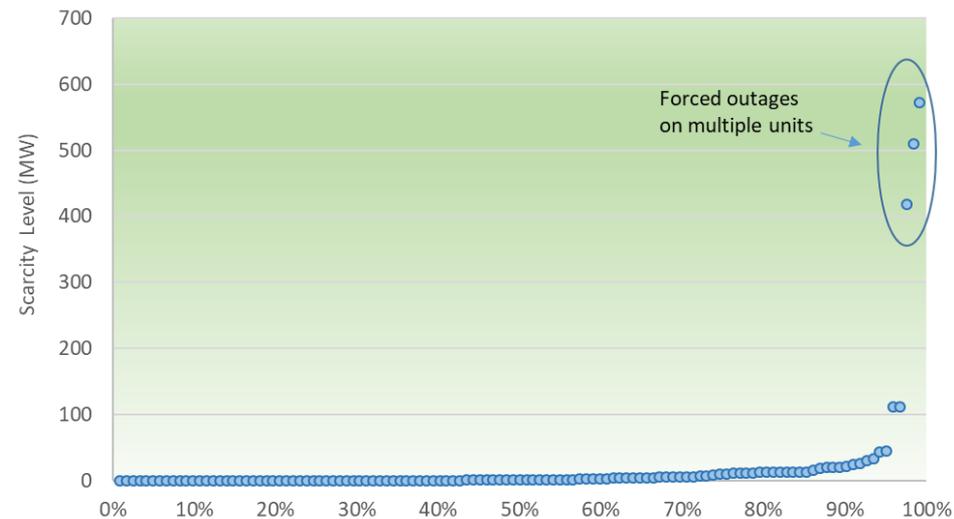


Although frequency has increased, magnitude of scarcities is generally small



- About 75% of scarcities was for less than 10 MW

- About 81% of scarcities was for less than 10% of the target requirement

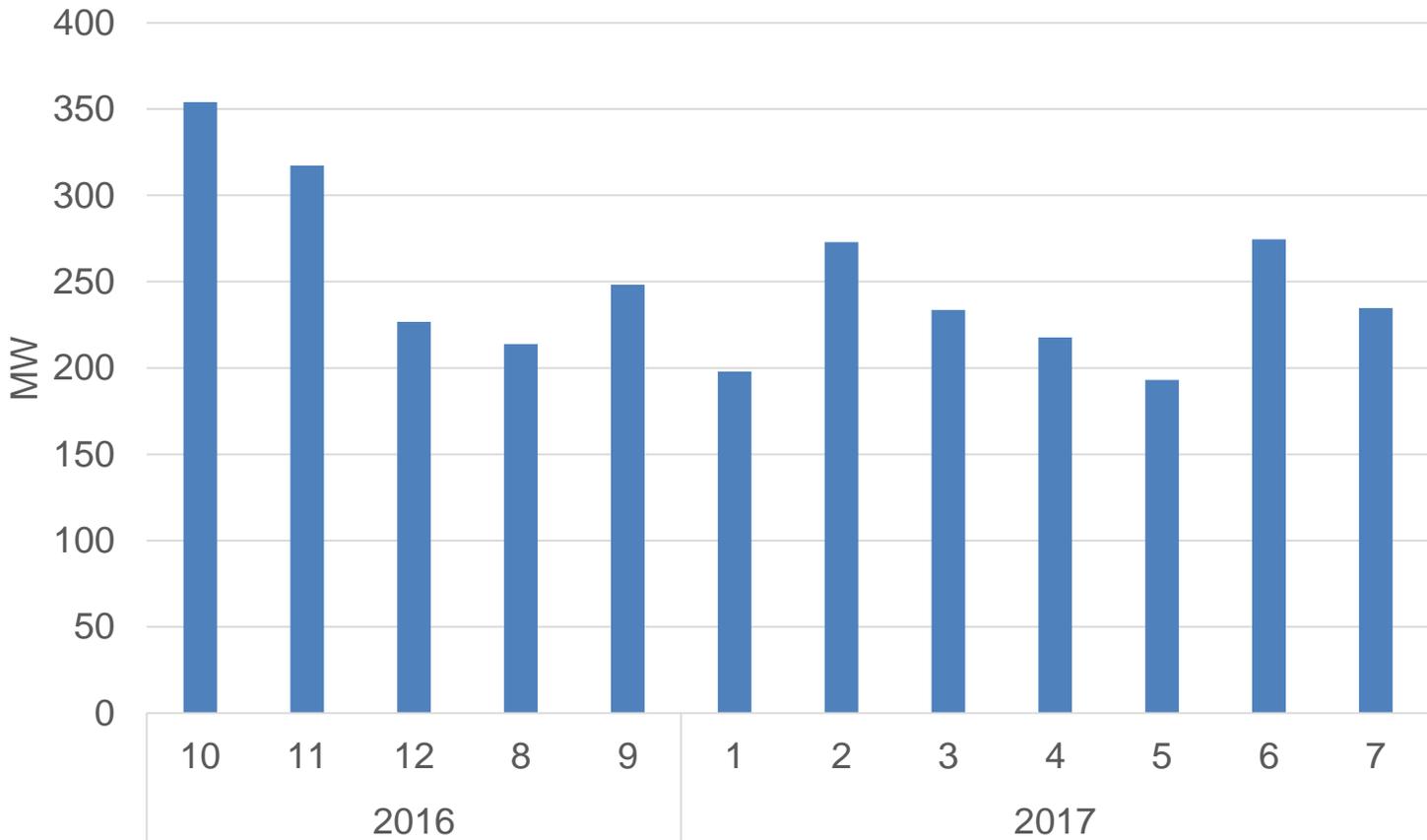


Market Power Mitigation Impact Assessment

In some days of 2017, MPM prices were lower than IFM prices

- Derates were missed in the day-ahead market power mitigation run
 - Energy schedule was below derate
 - Energy + Reg-up + Spin + Non-spin may exceed derate
 - The correct derates were used in dynamic path assessment, and IFM
- Impacted period was August 17 2016 and ended on July 21 2017

System wide MPM total schedule above derate



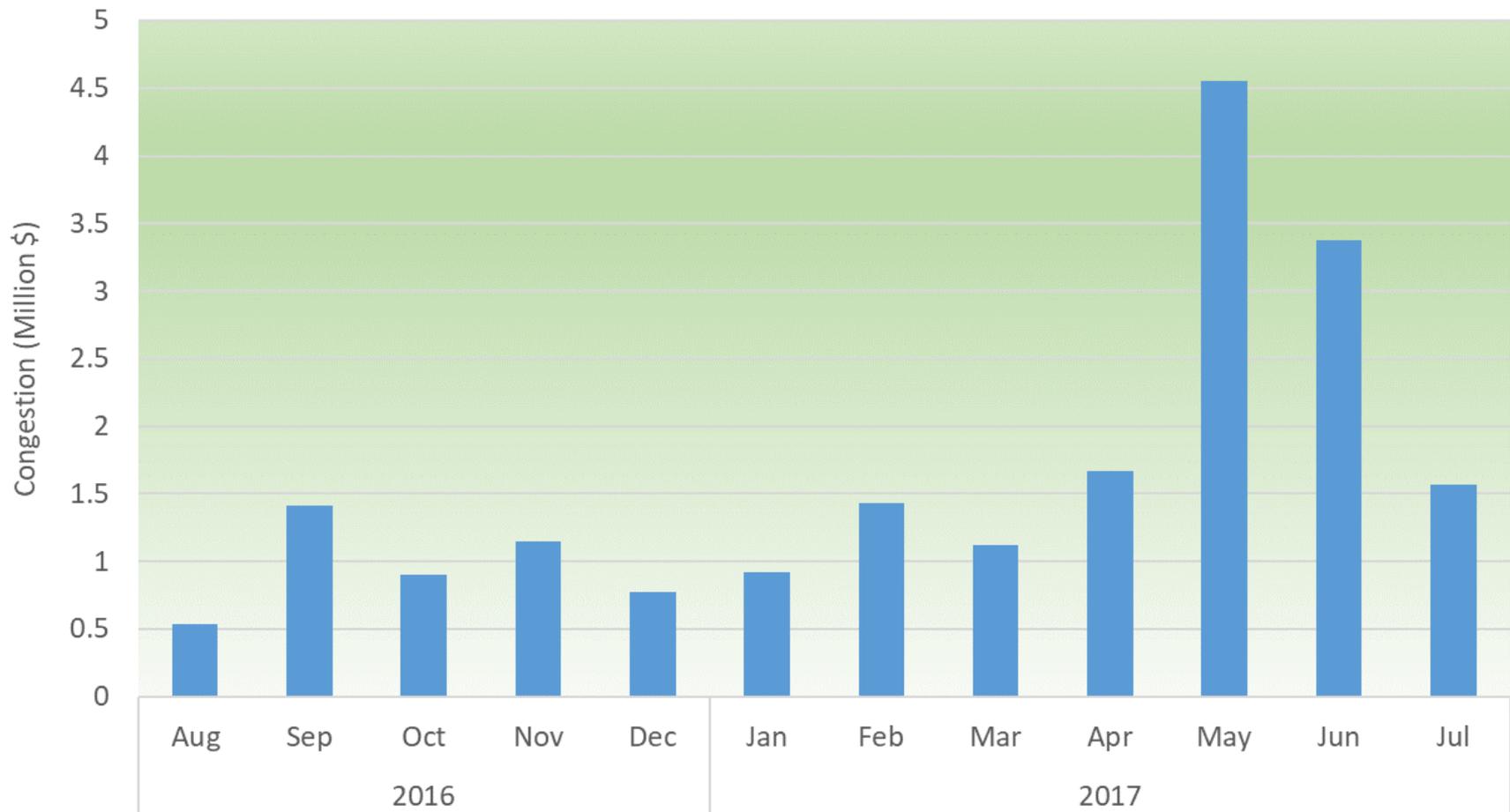
Characteristics of the issue

- The issue does not directly affect IFM, because IFM used the correct derates
- The issue may indirectly affect IFM by impacting LMPM
- The issue gives too much freedom to the LMPM run, and may cause under identified constraints and under mitigation
 - some constraints not binding in LMPM run
 - lower shadow prices on non-competitive constraints
- As a result, the factual IFM may be based unmitigated bids

The analysis

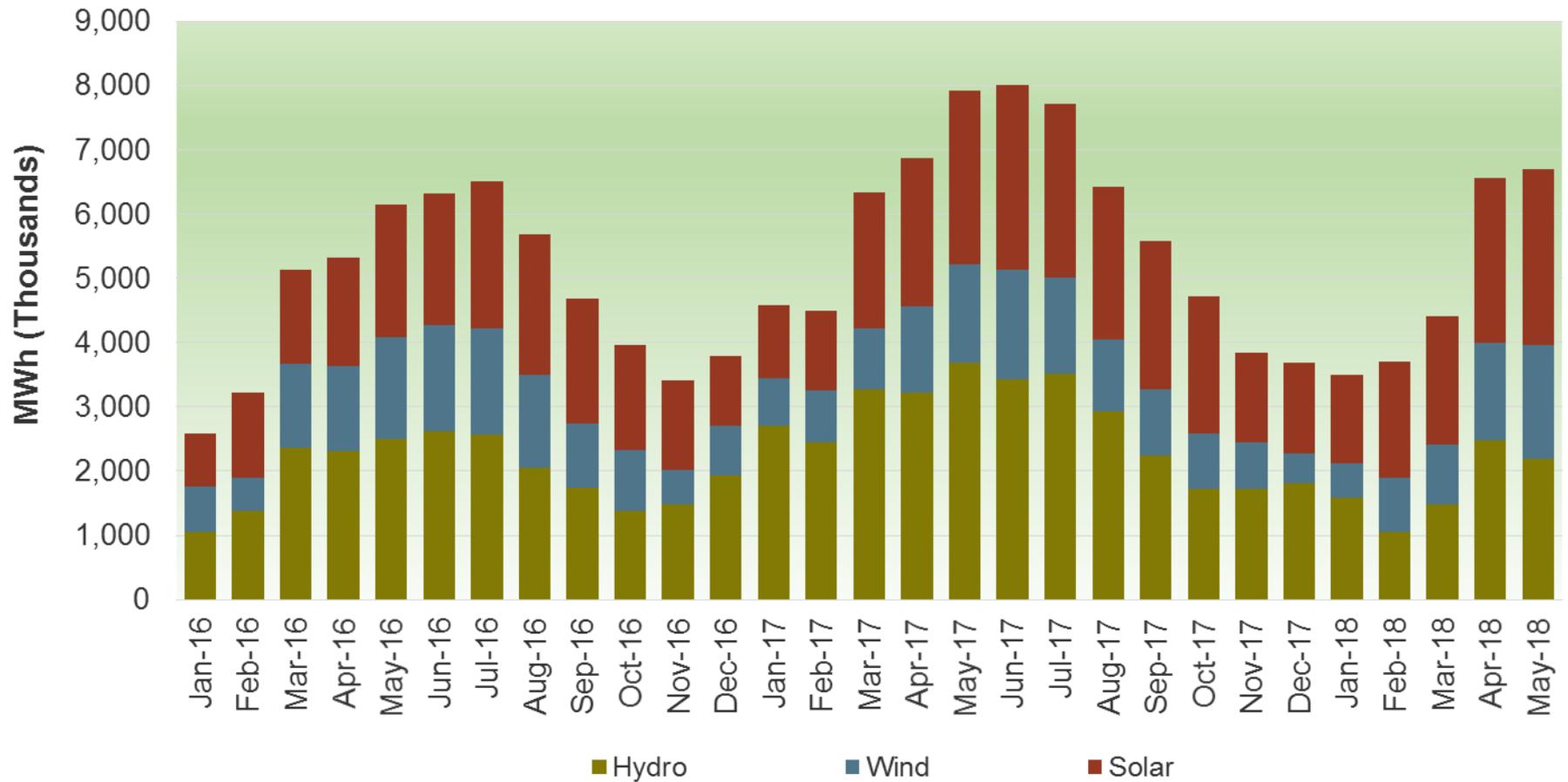
- Identify from LMPM run to IFM run
 - new binding constraints in the IFM
 - increased shadow prices in the IFM
- Assume these congestion changes are non-competitive and can be fully mitigated (a conservative assumption), but have not been mitigated
- Calculate the congestion rent increase
 - The congestion rent increase is a measure of the impact to the total market payment
 - Congestion rent increase calculation
 - Aggregated for each hour for all binding constraints
 - Only sum the congestion rent increased hours

Estimate of congestion rent impact in the day-ahead market

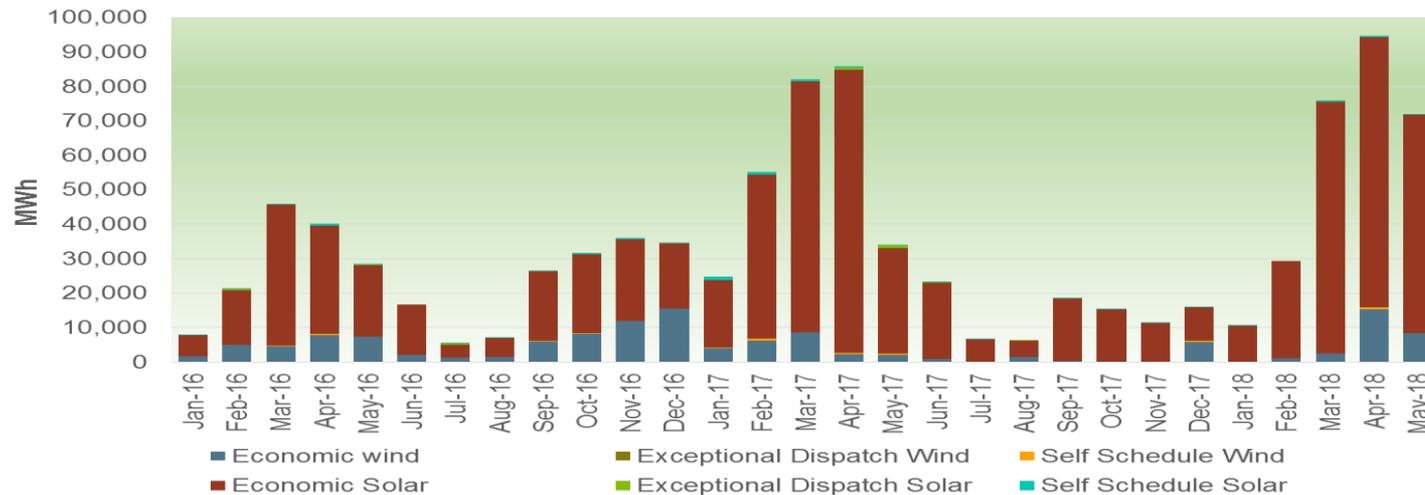
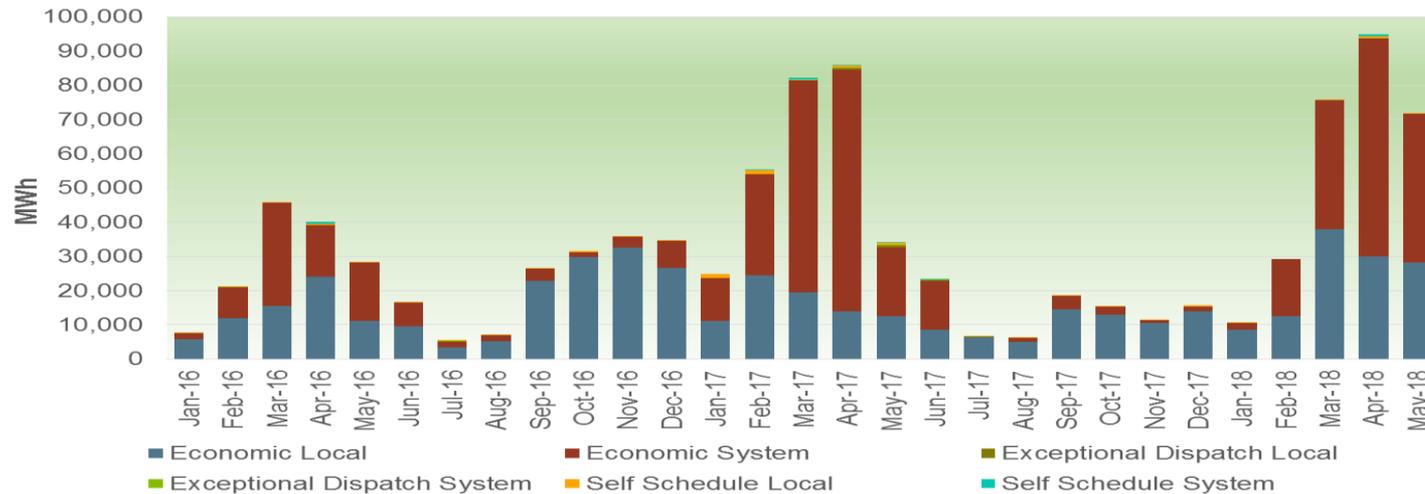


Oversupply conditions

Hydro production rose in April and May but still lower than previous year



RTD renewable (VERs) curtailment decreased in May



Persistency-based VER forecast

Why Is the Persistence Method needed?

Current:



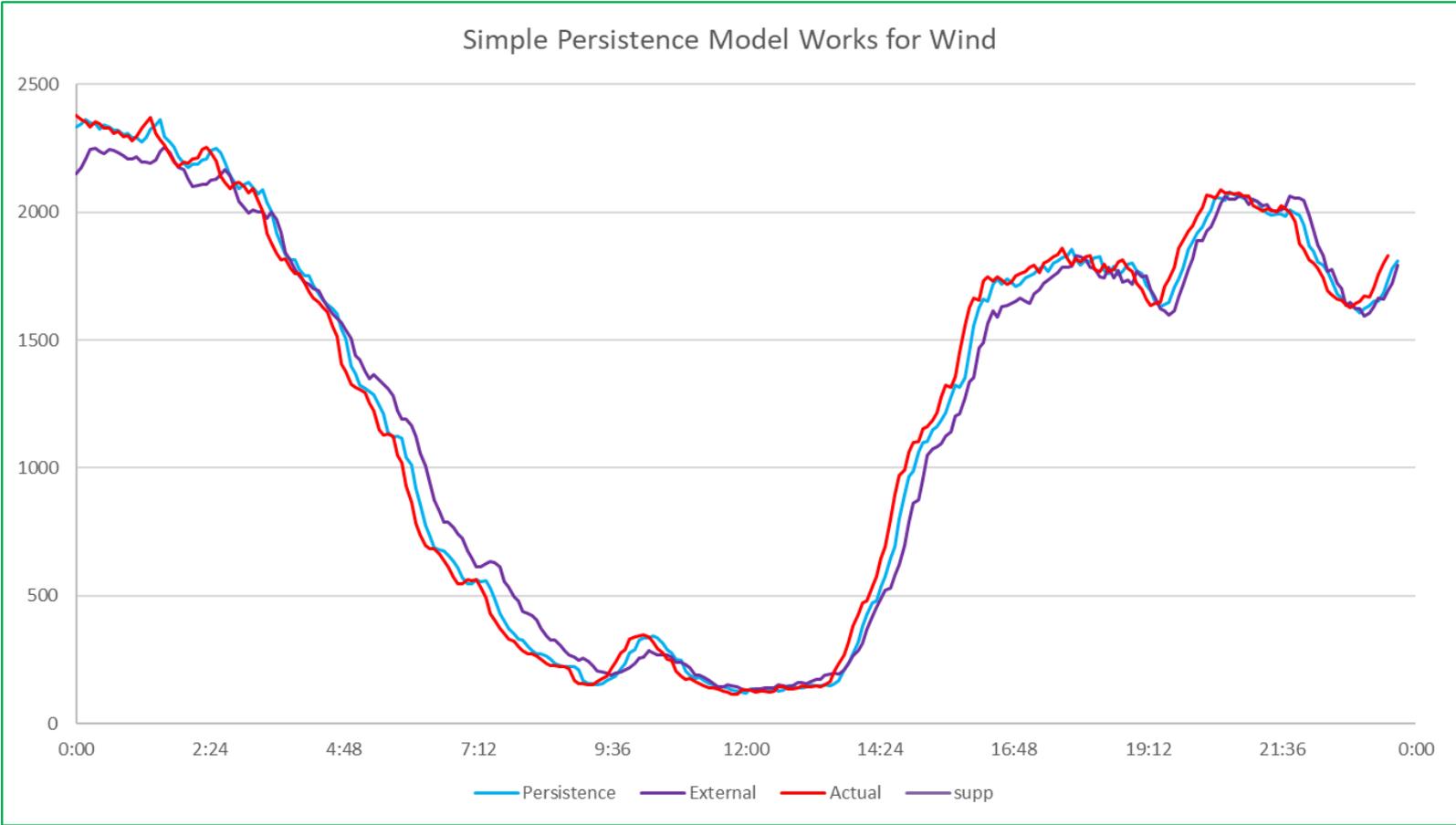
Persistence Method:

- More recent actuals are used in forecast
- 6+ minutes are eliminated from lag

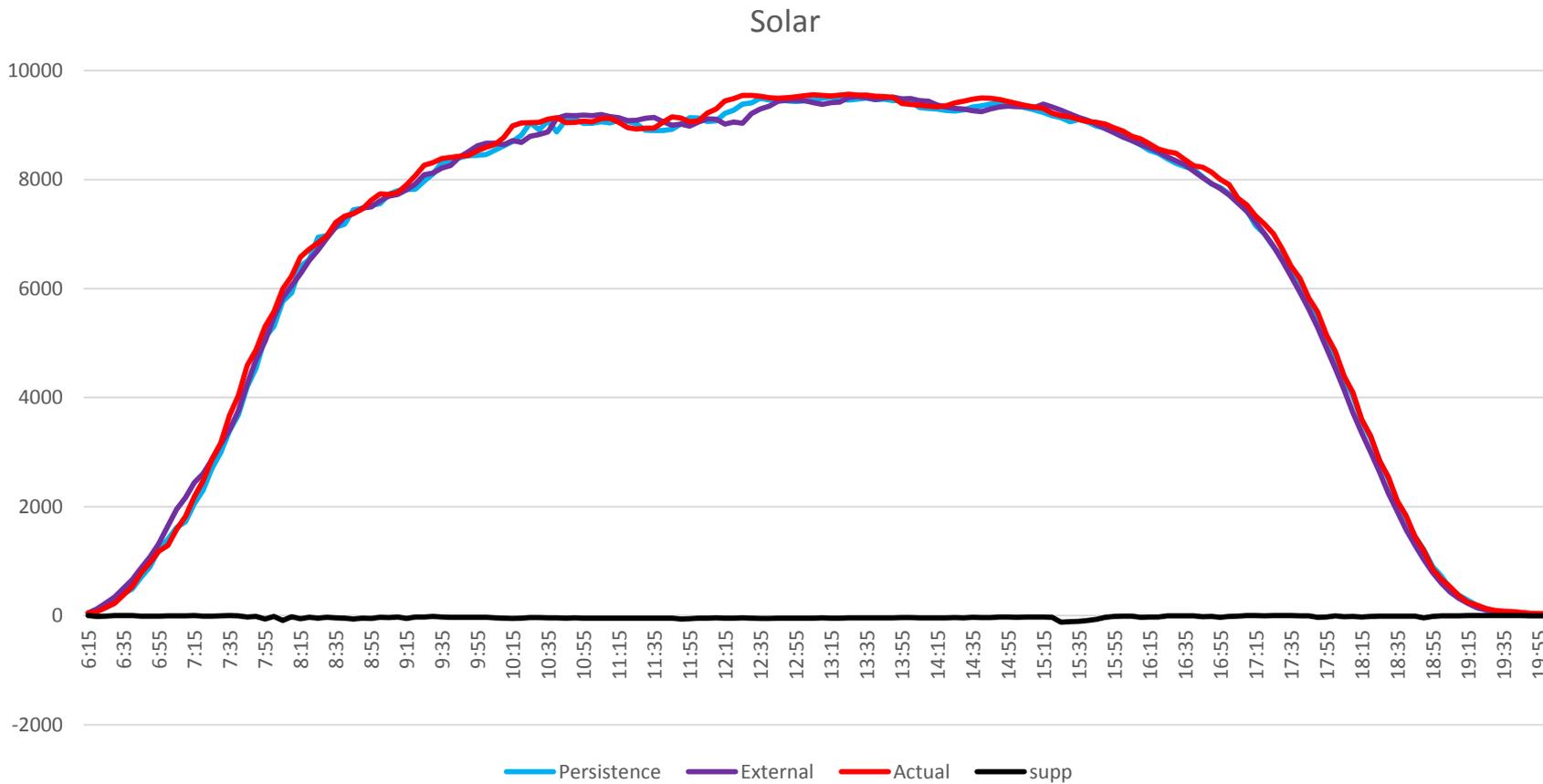


Forecast calculated in market, eliminating ALFS & processing time needed outside of CAISO

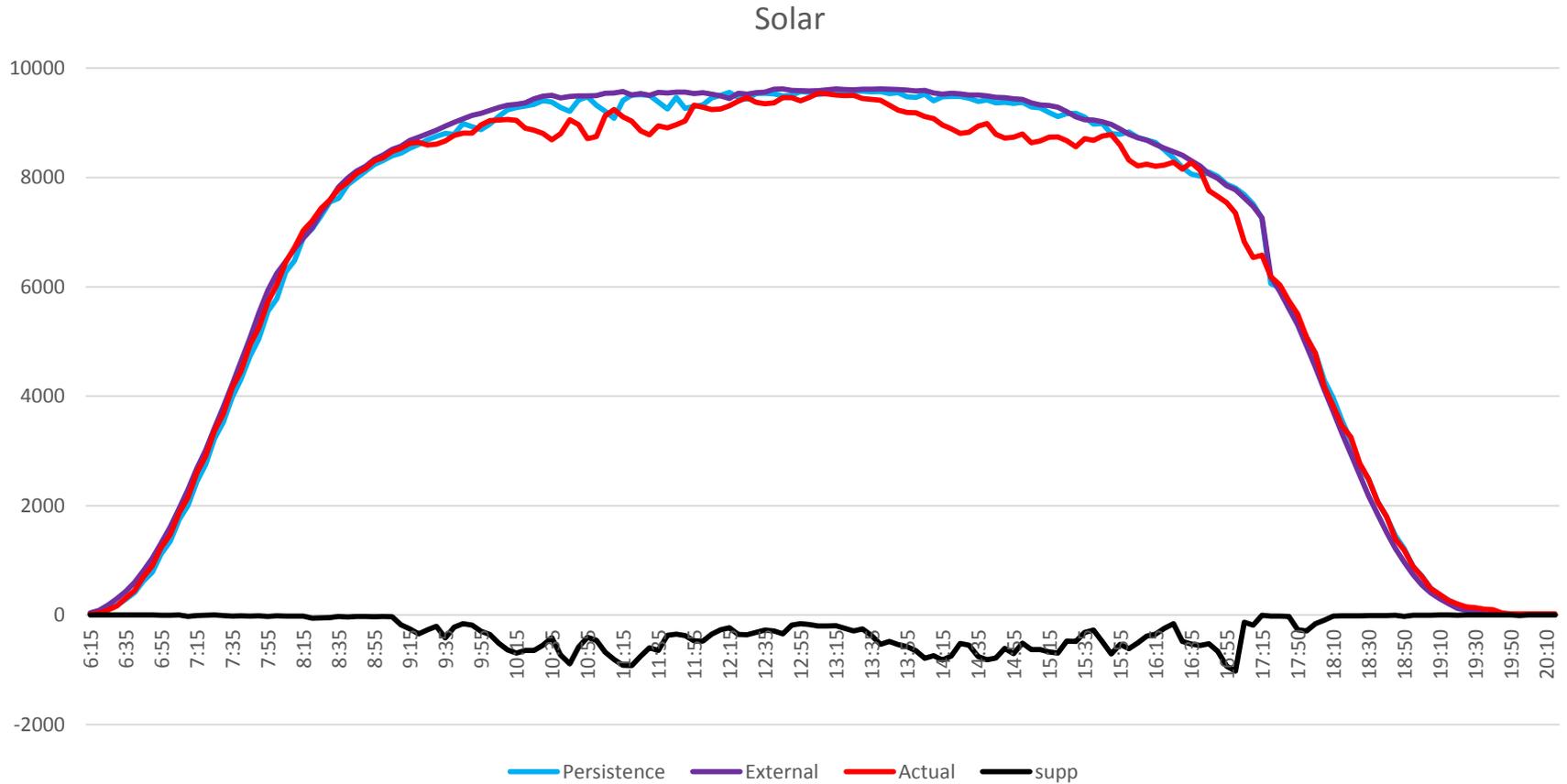
Impact of Shortened Processing Time for Wind



Results: Contour Persistence Works for Solar

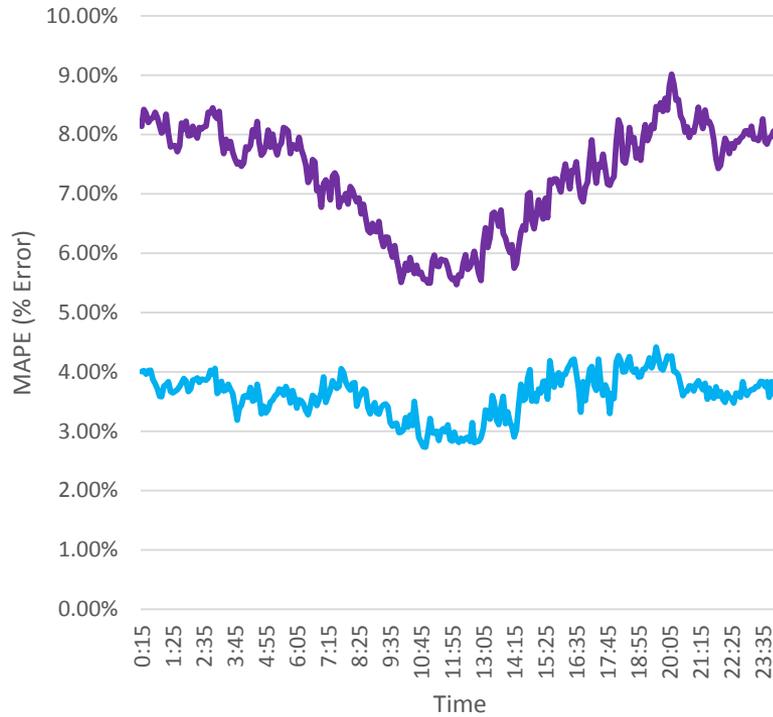


Results: Contour Persistence Method when Heavy Supplemental Dispatches are Present



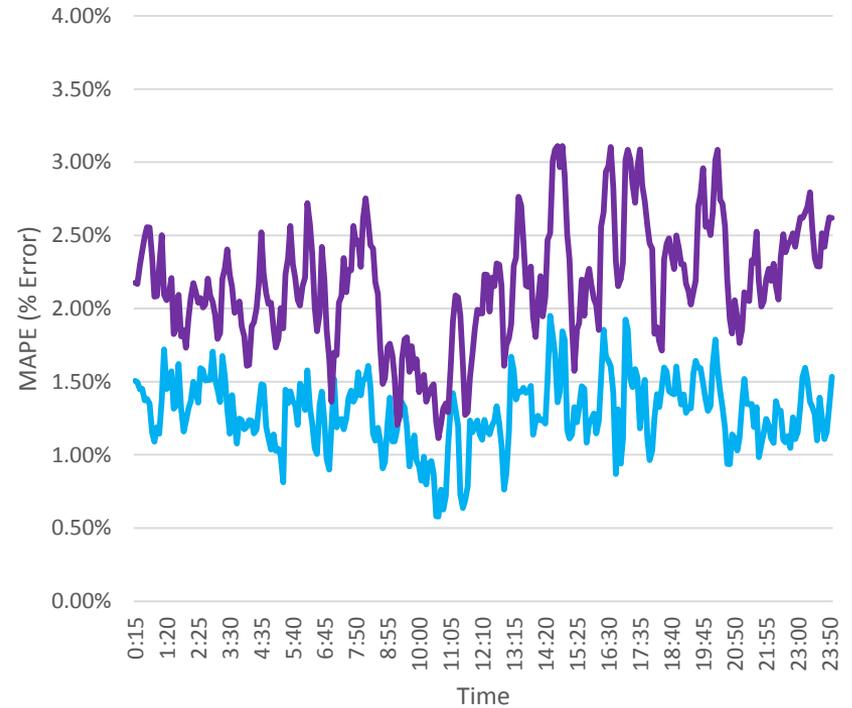
Results: RTD Wind Mean Absolute Percent Error (MAPE)

MAPE Comparison: Resource



— Persistence — External FSP

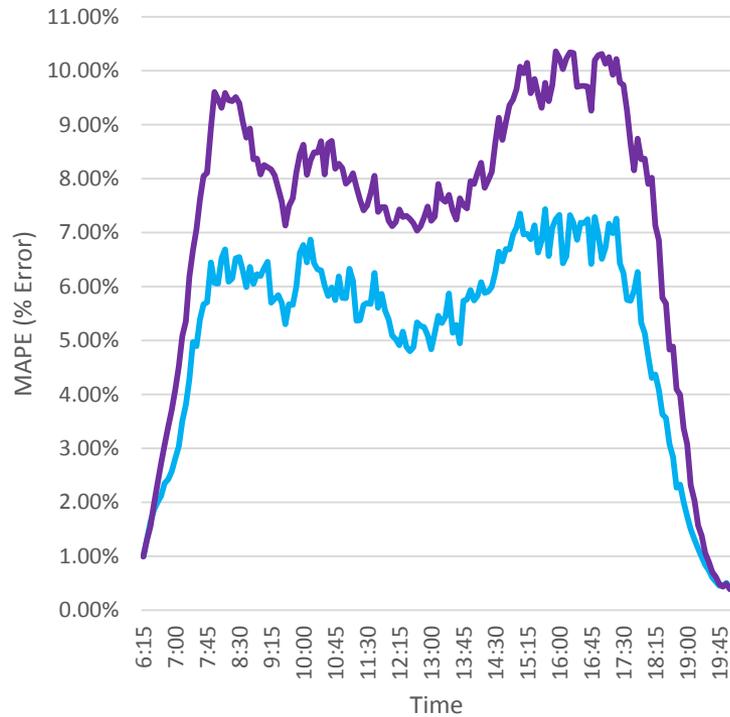
MAPE Comparison: System



— Persistence — External FSP

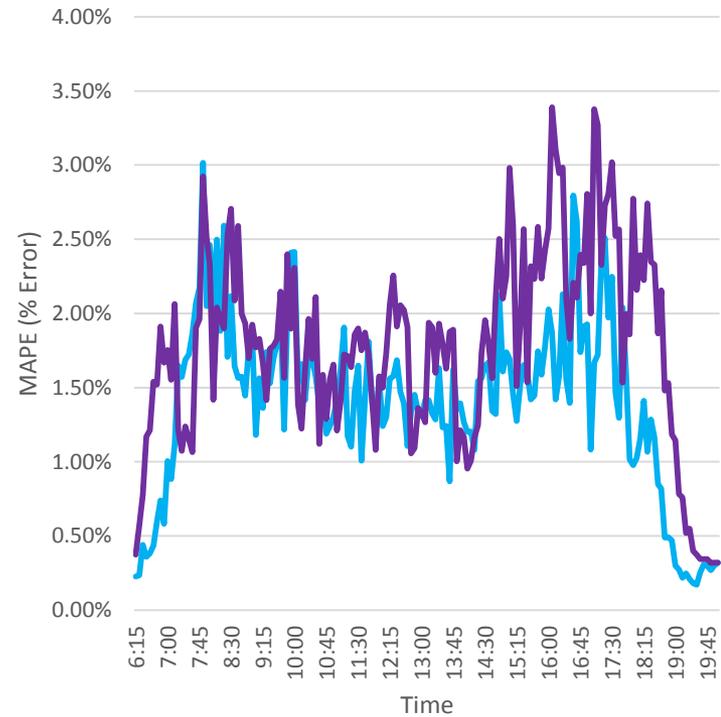
Results: RTD Solar Mean Absolute Percent Error (MAPE)

MAPE Comparison: Resource



— Persistence — External FSP

MAPE Comparison: System



— Persistence — External FSP

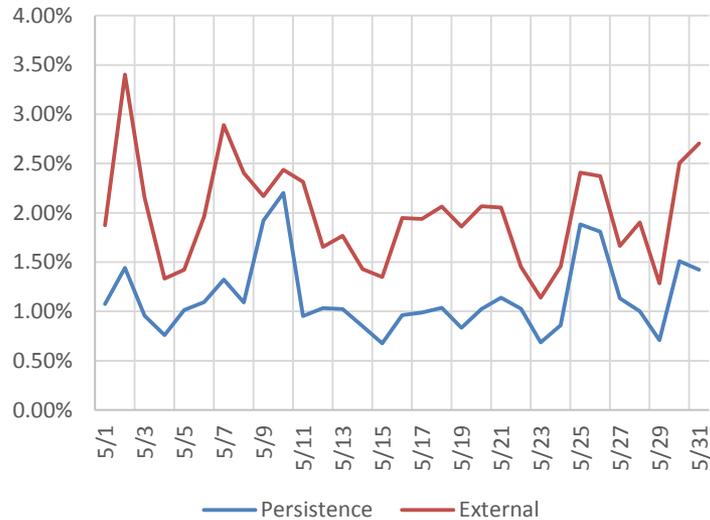
Summary

- Persistence Implemented on 4/18/2018
- Monthly Performance Review for 5/1-5/30, 2018
- Mean Absolute Percentage Error (MAPE) improvement

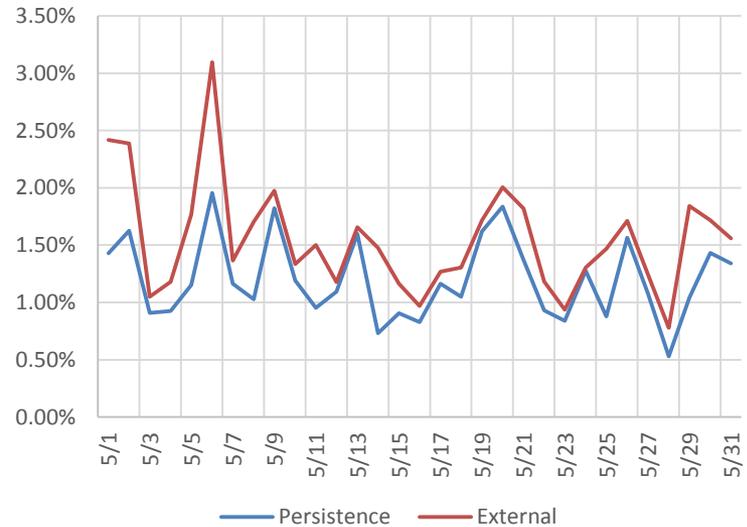
FUEL_TYPE	Persistence	External
SOLAR	1.22%	1.56%
WIND	1.15%	1.98%

Persistence Method: Daily Error

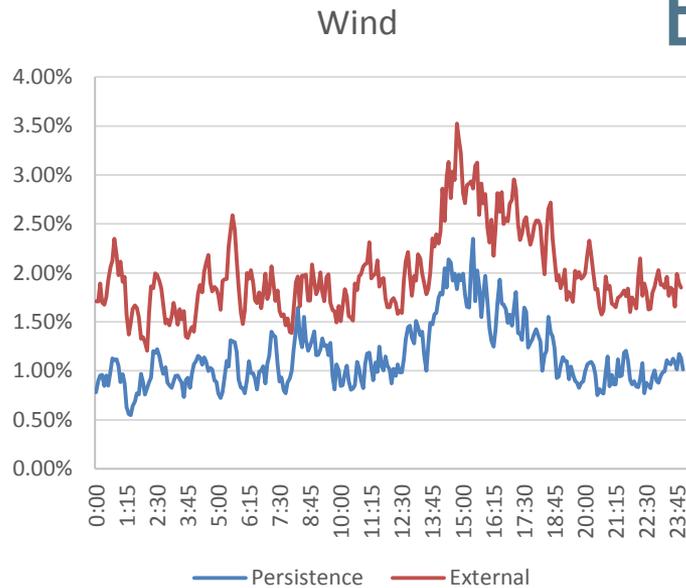
Wind



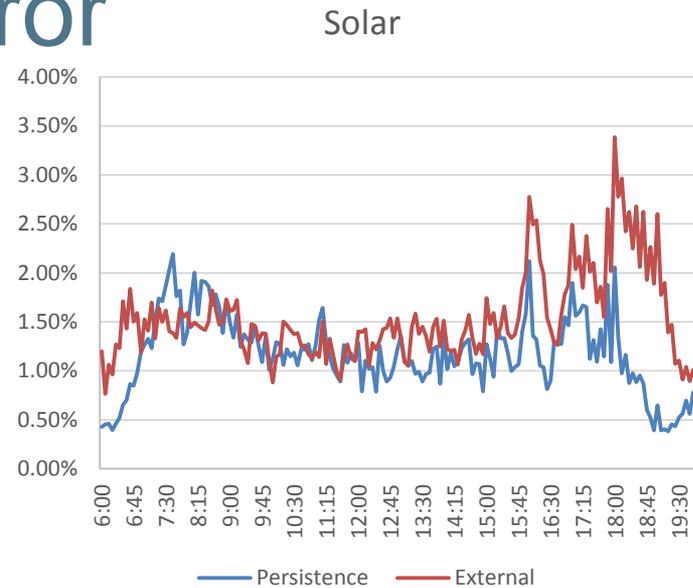
Solar



Persistence Method: Time Interval Error

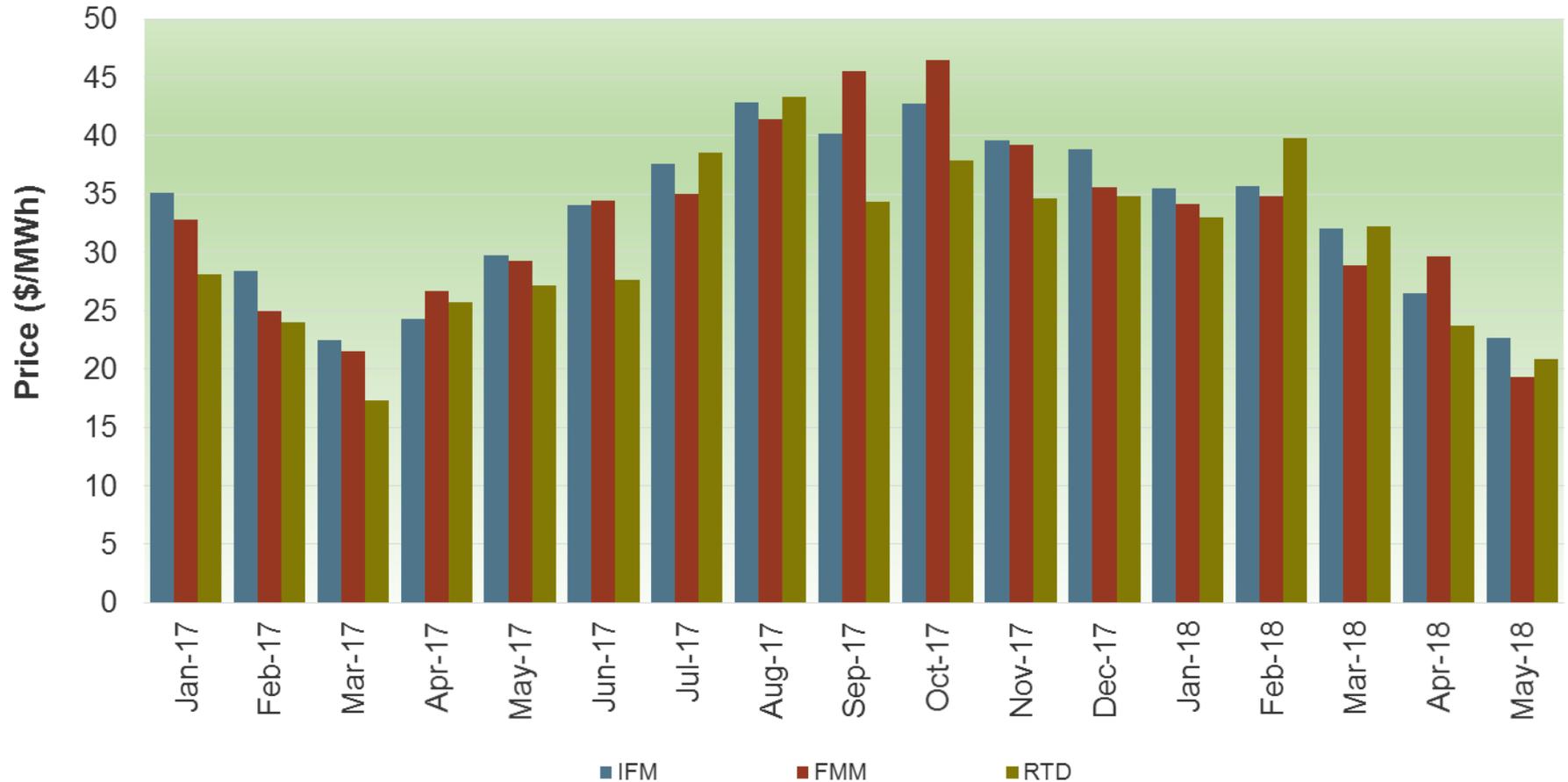


Error



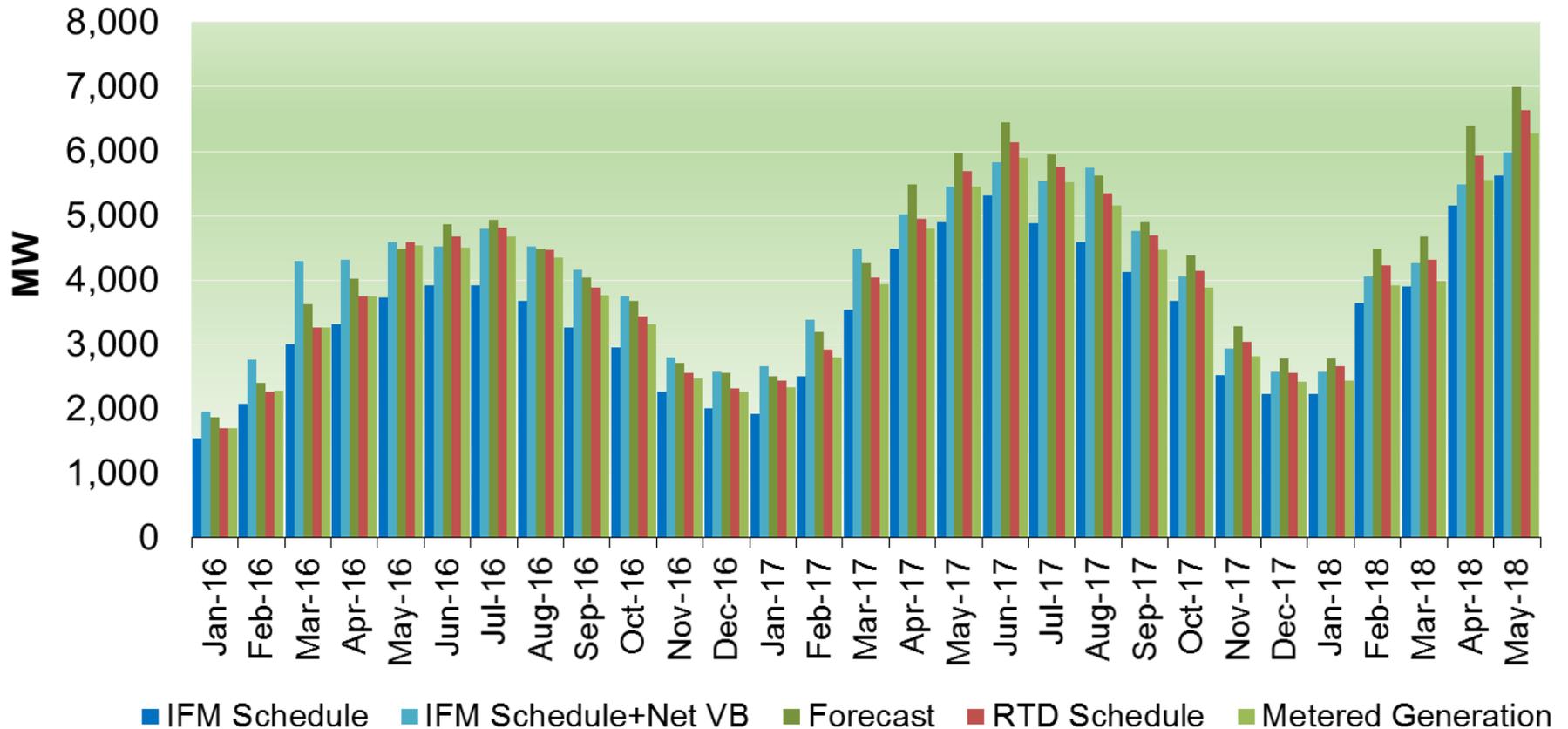
Market Update

Good convergence was observed in May

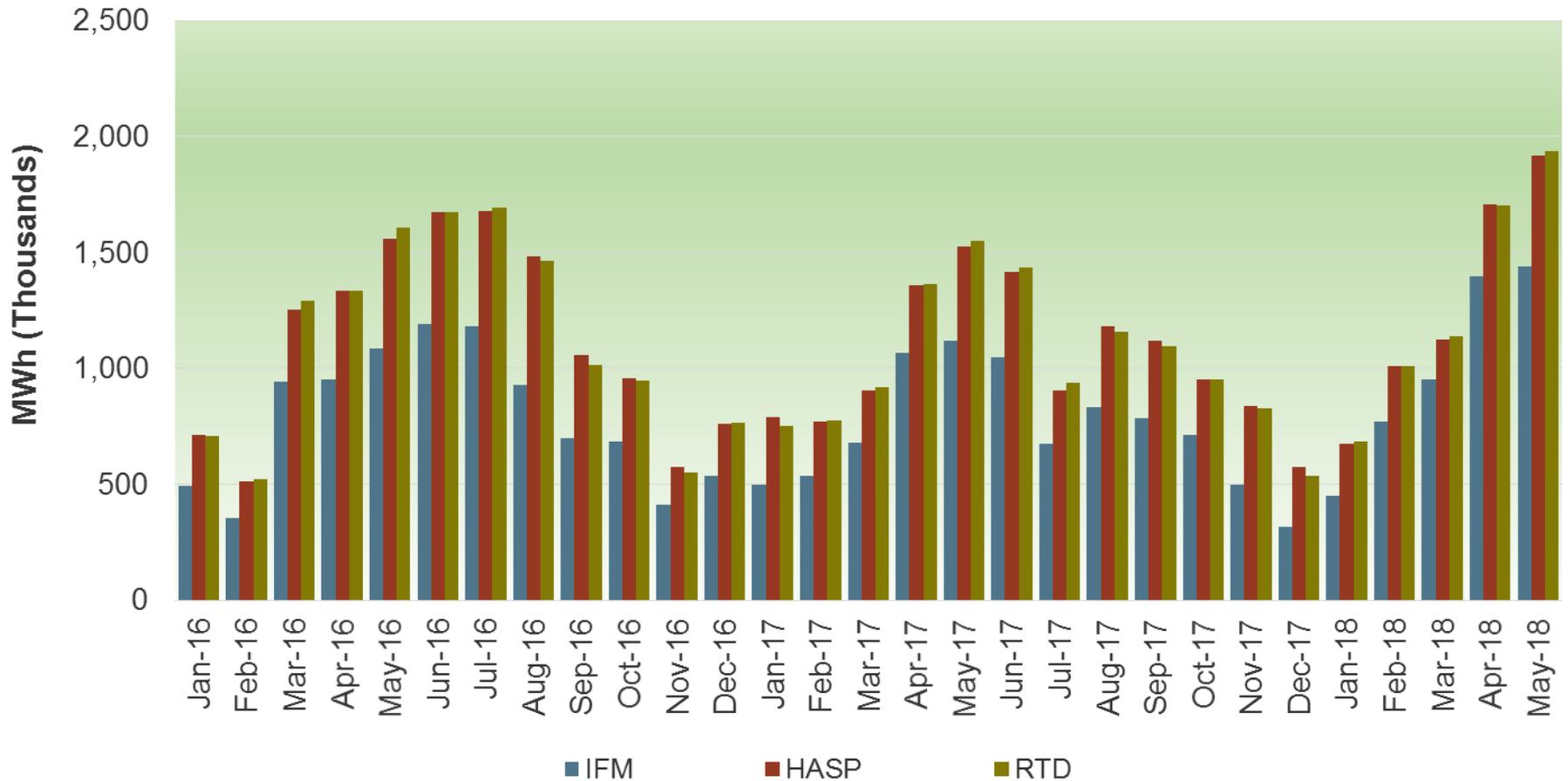


Note: Metric Based on System Marginal Energy Component (SMEC)

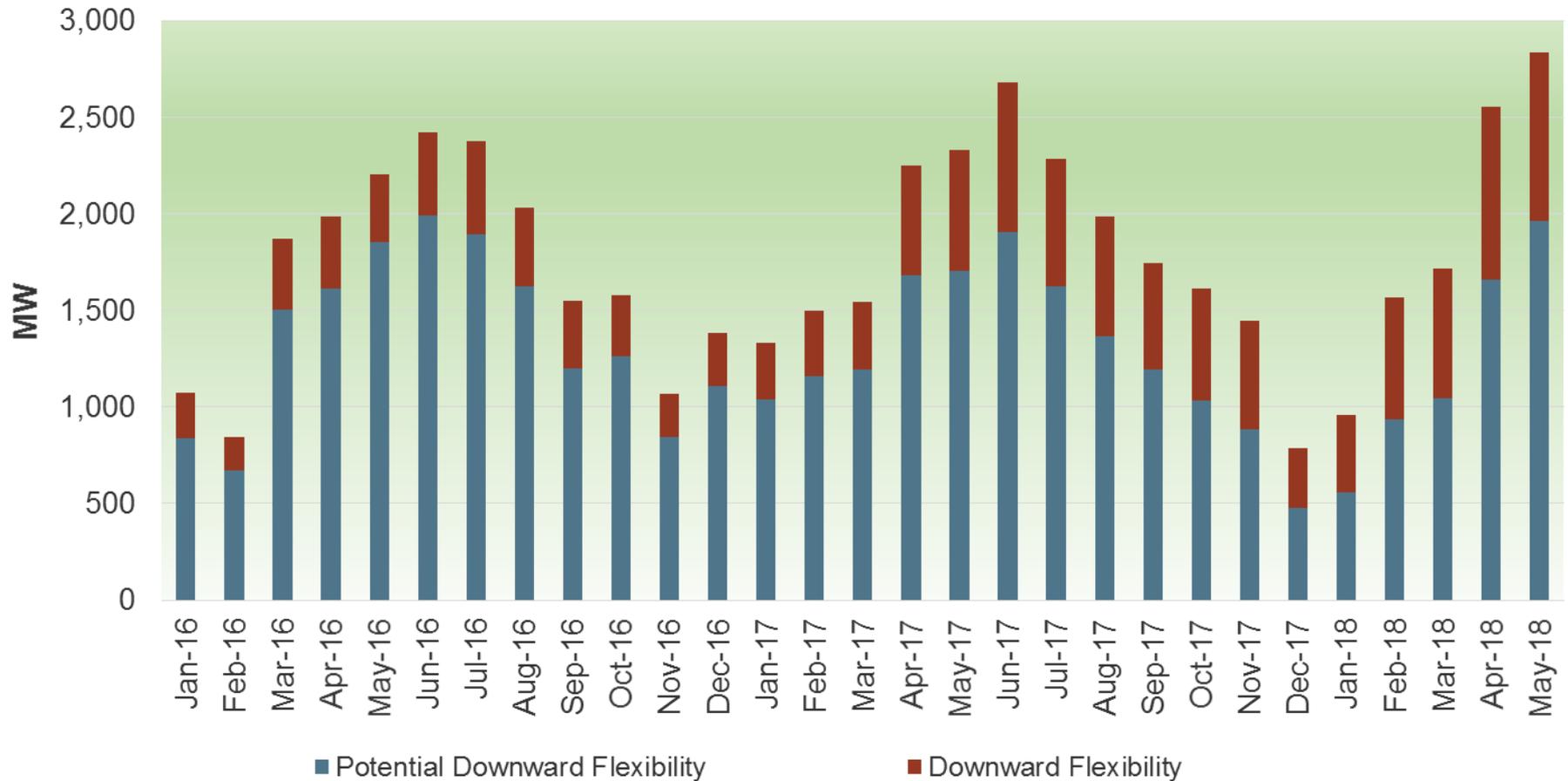
ISO total monthly VERS schedules and forecasts



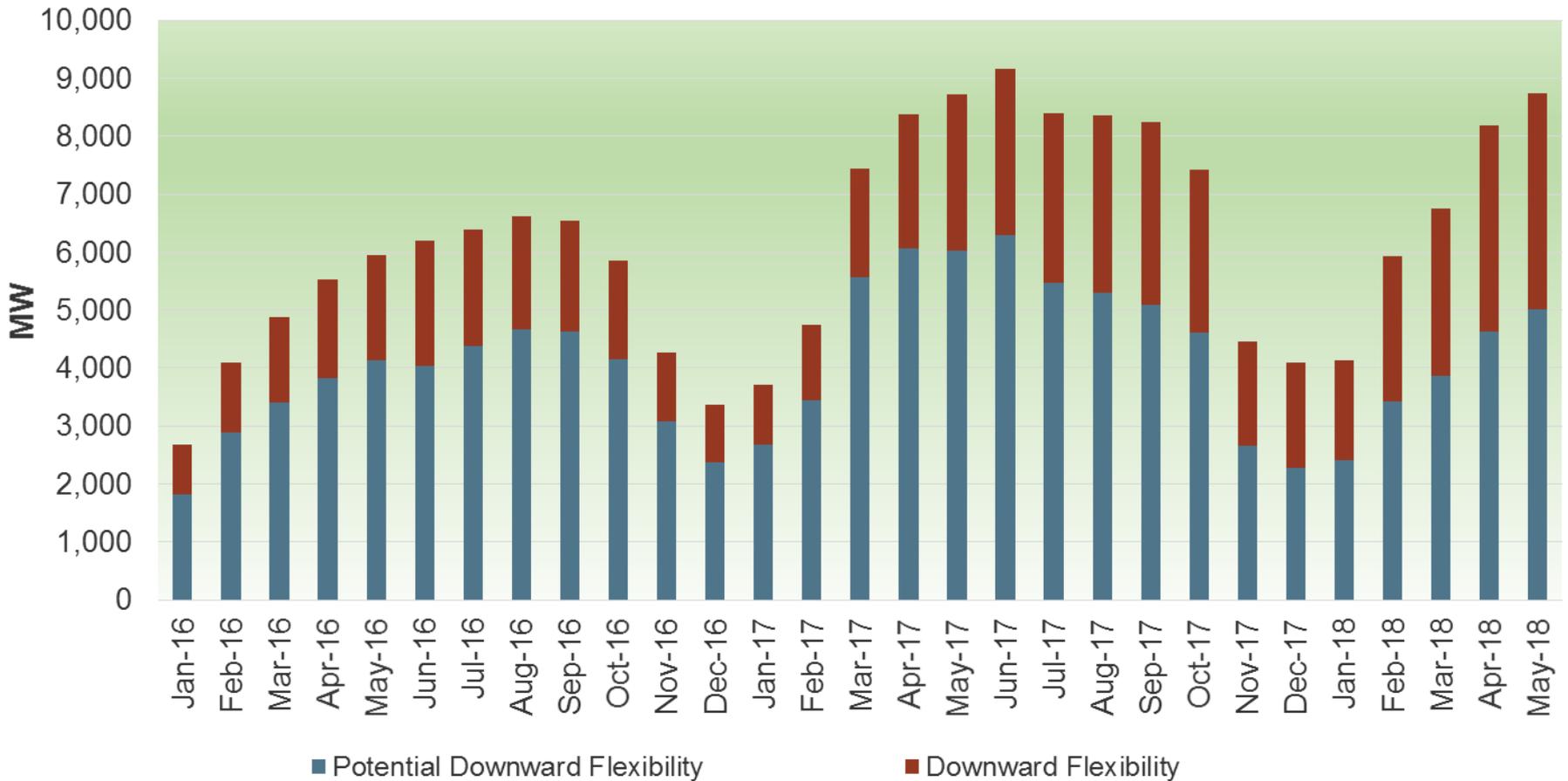
IFM under-scheduling of wind generation



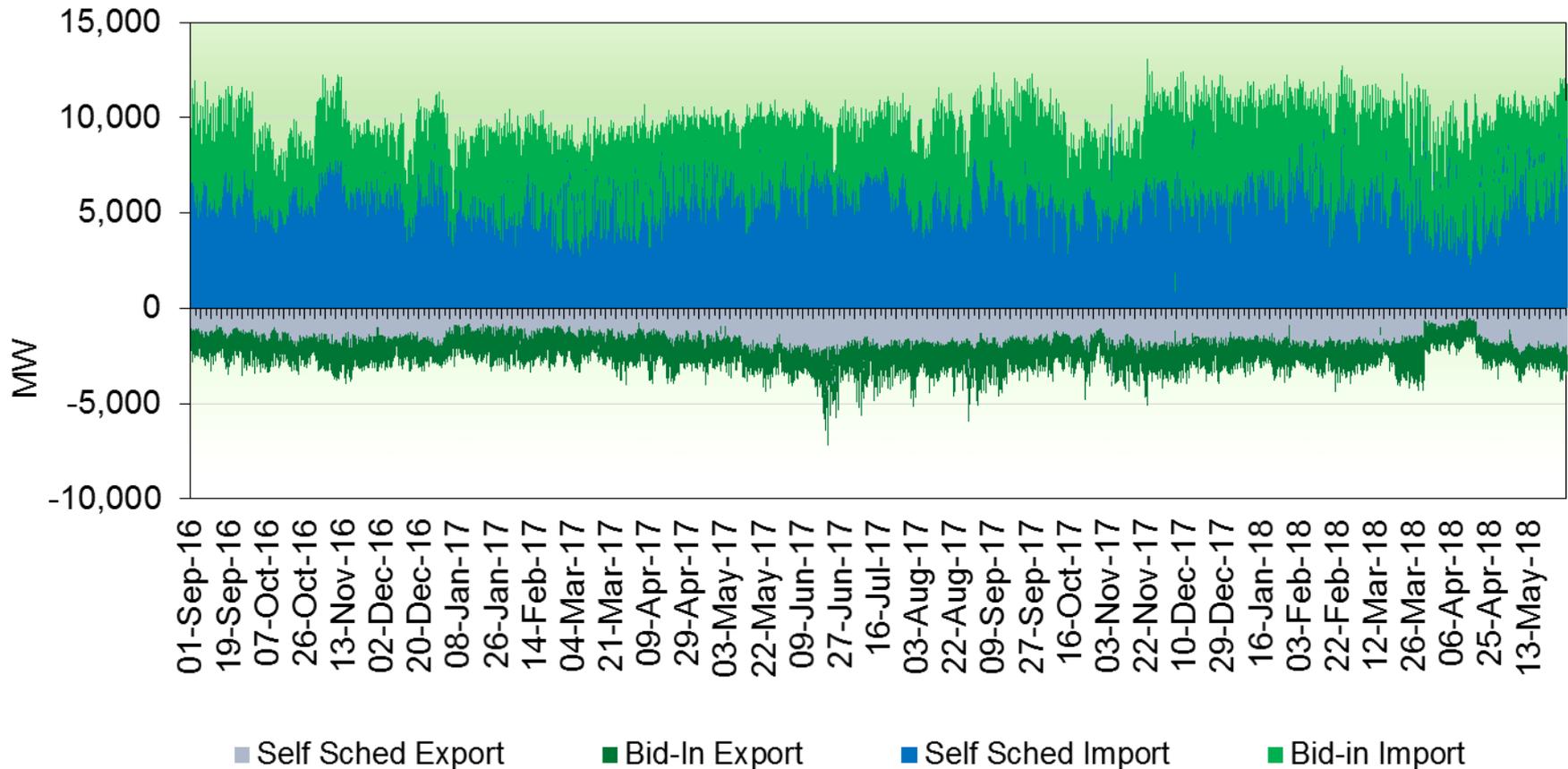
Monthly wind (VERS) downward flexibility in FMM



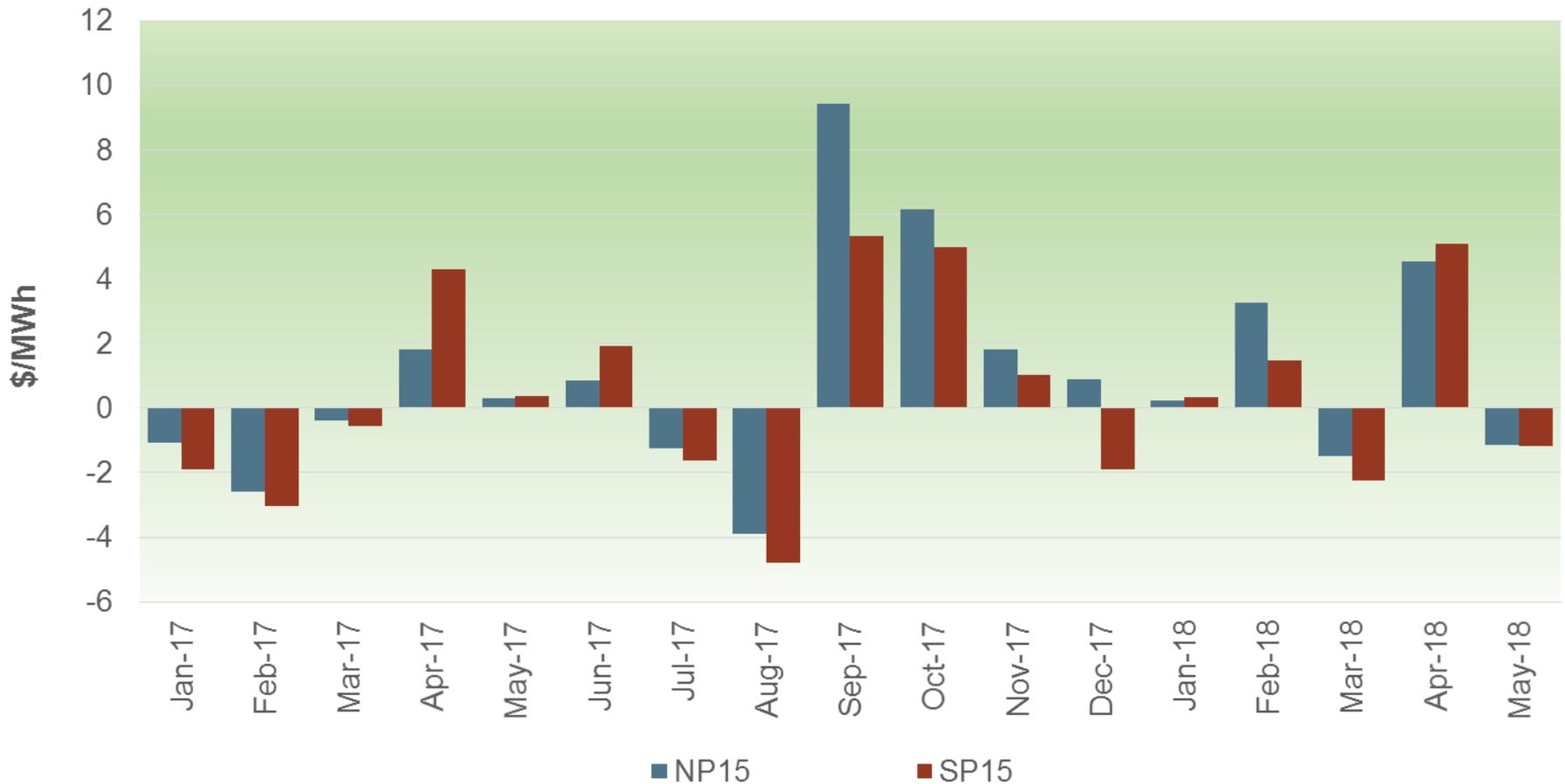
Monthly solar (VERs) downward flexibility in FMM from 11 AM to 5 PM



Self scheduled interties in the real-time market remained high



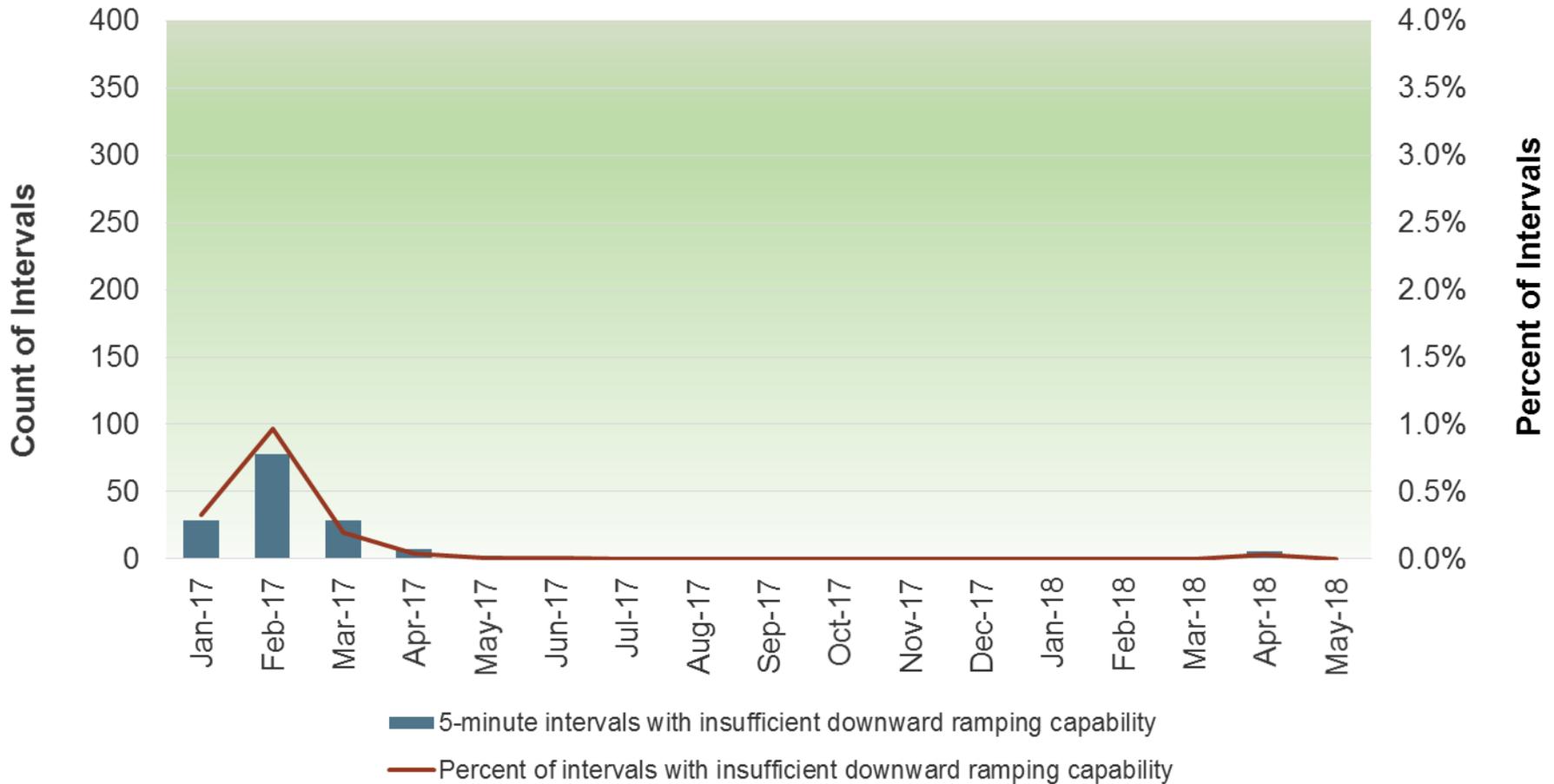
RT prices lower than DA prices for both NP15 and SP15 in May



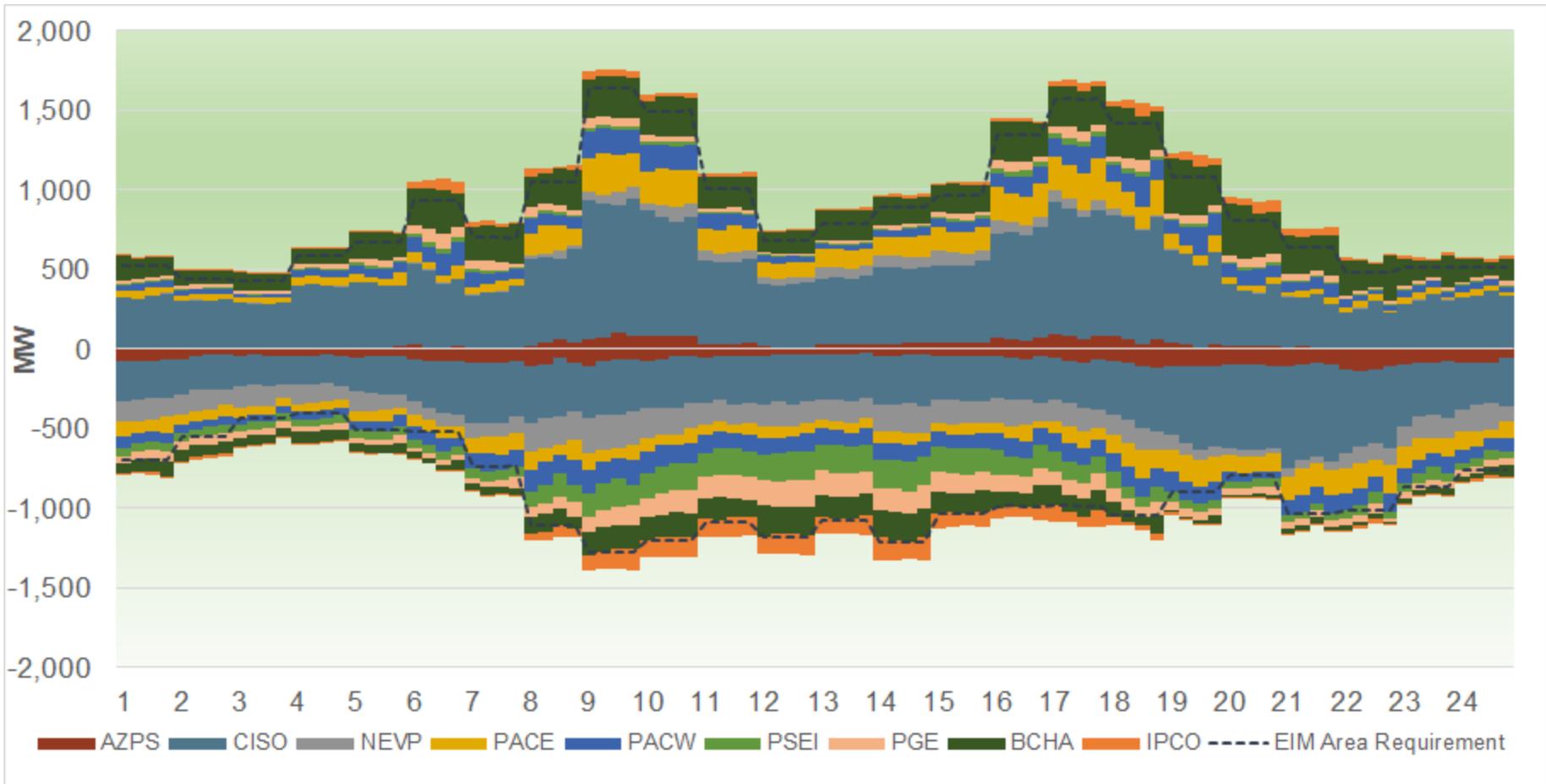
Insufficient upward ramping capacity in ISO trended downward since February



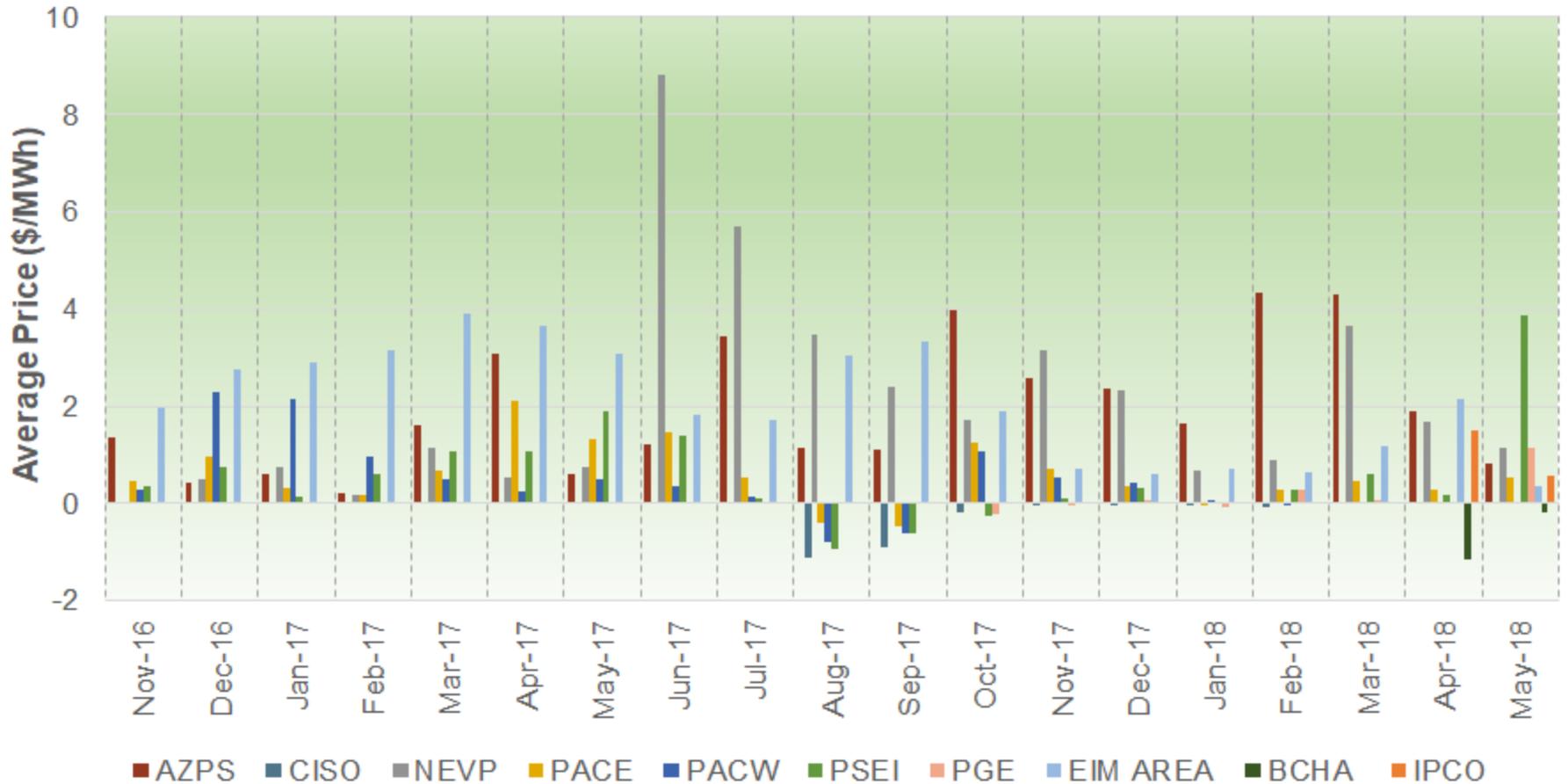
Insufficient downward ramping capacity stayed low in April and May.



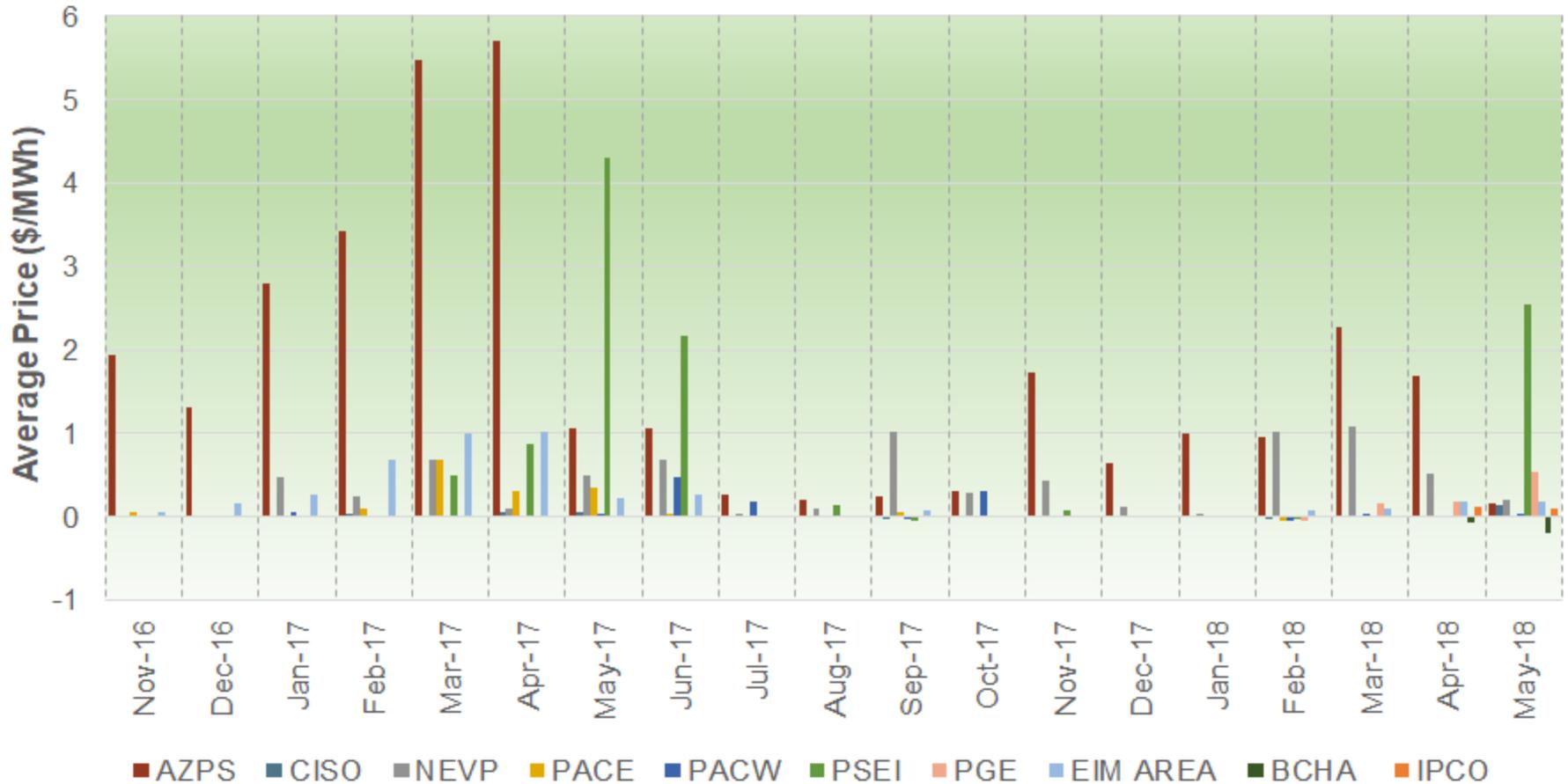
Average Flexible Ramp Product Cleared Awards for each area with EIM Area Requirement -March - May 2018



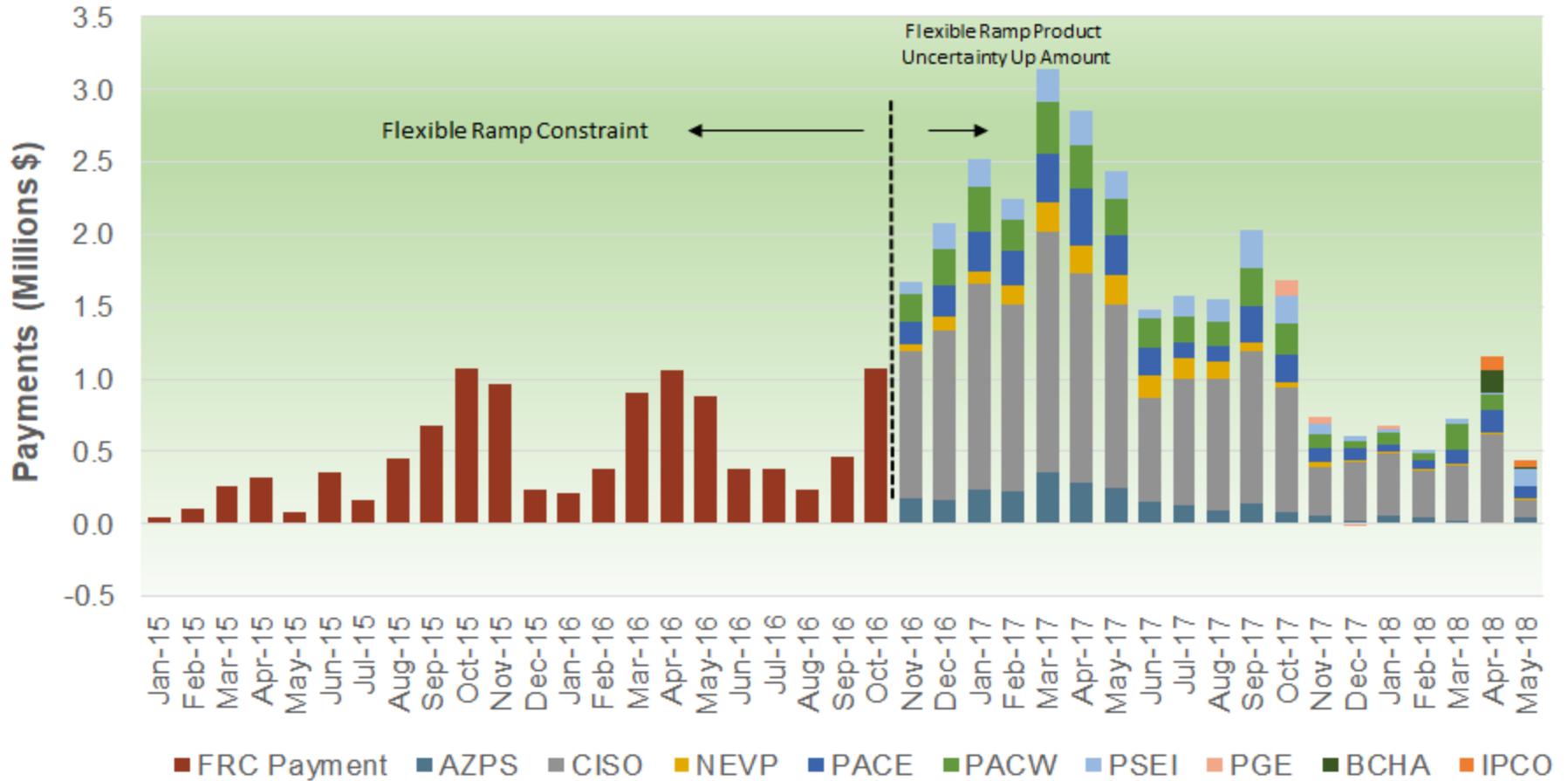
Average Flexible Ramp Up Price (\$/MWh)



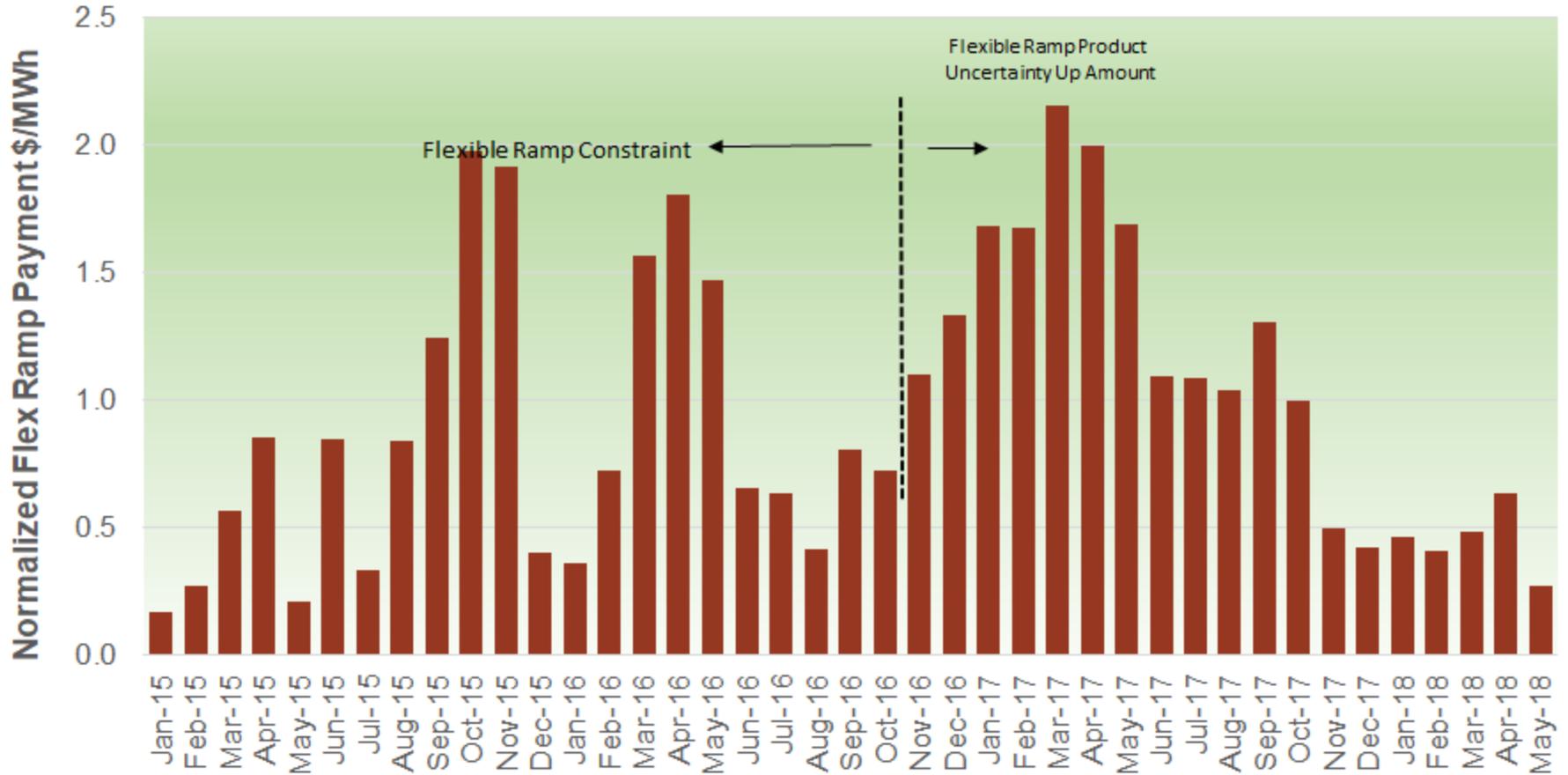
Average Flexible Ramp Down Price (\$/MWh)



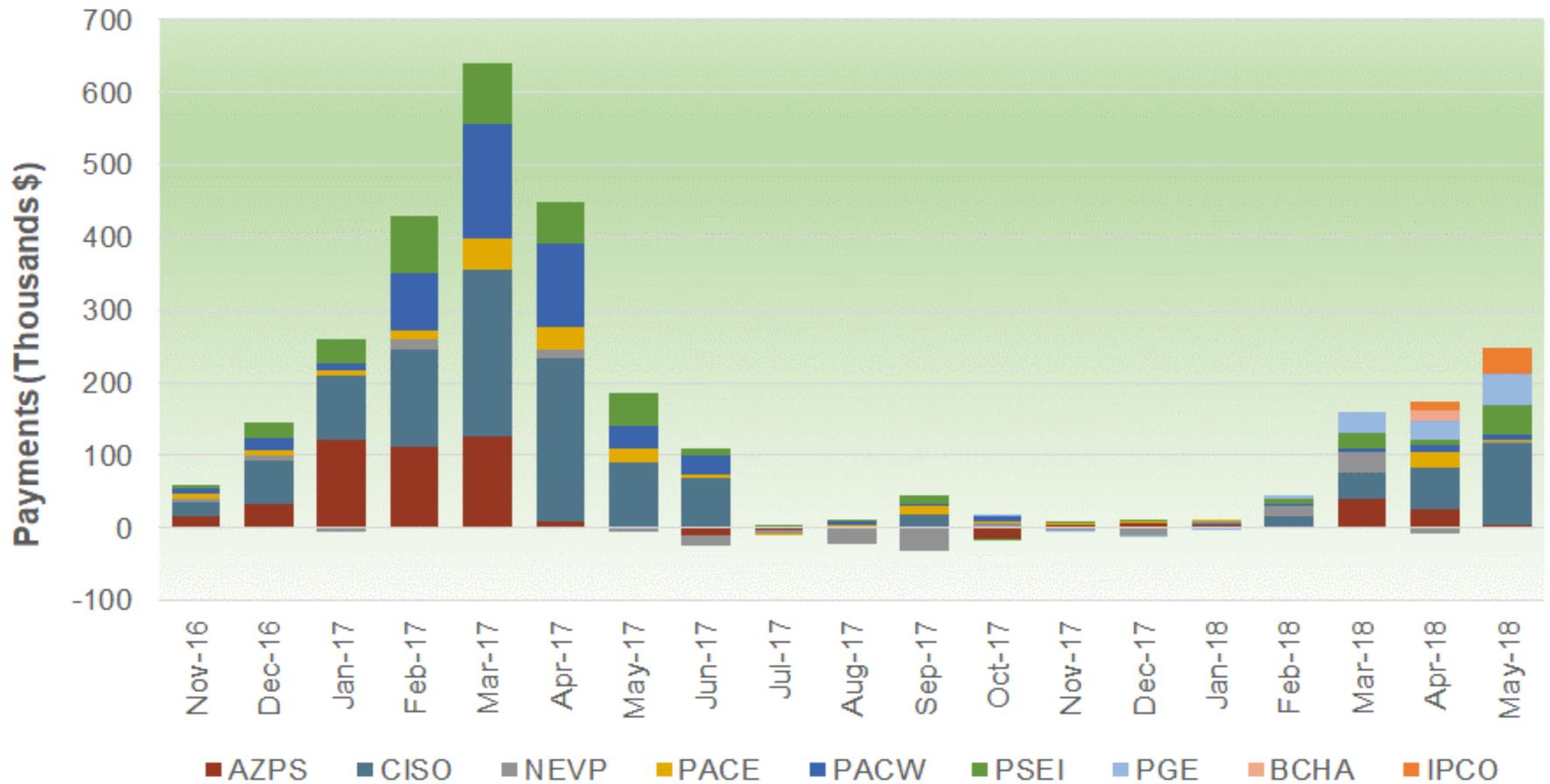
Uncertainty Up Settlement Amount



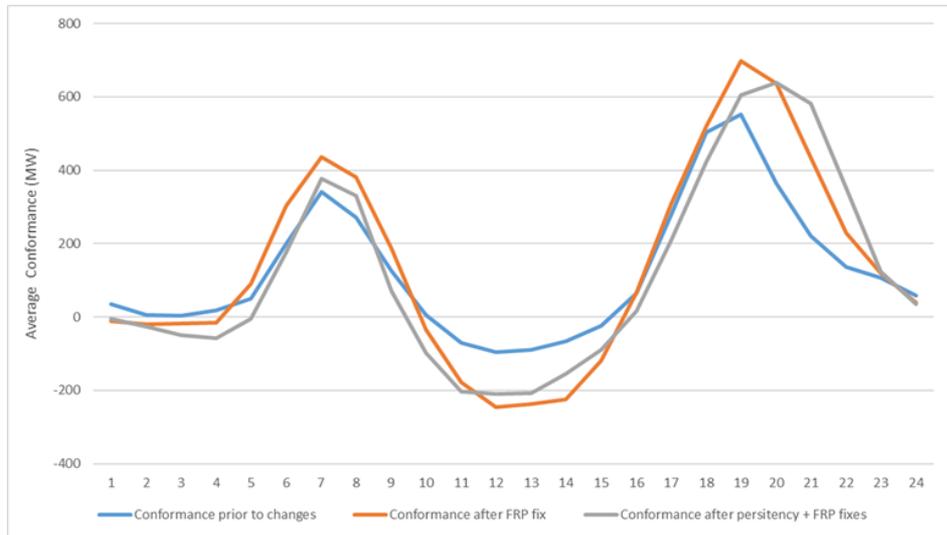
Normalized Flex Ramp Up Payment



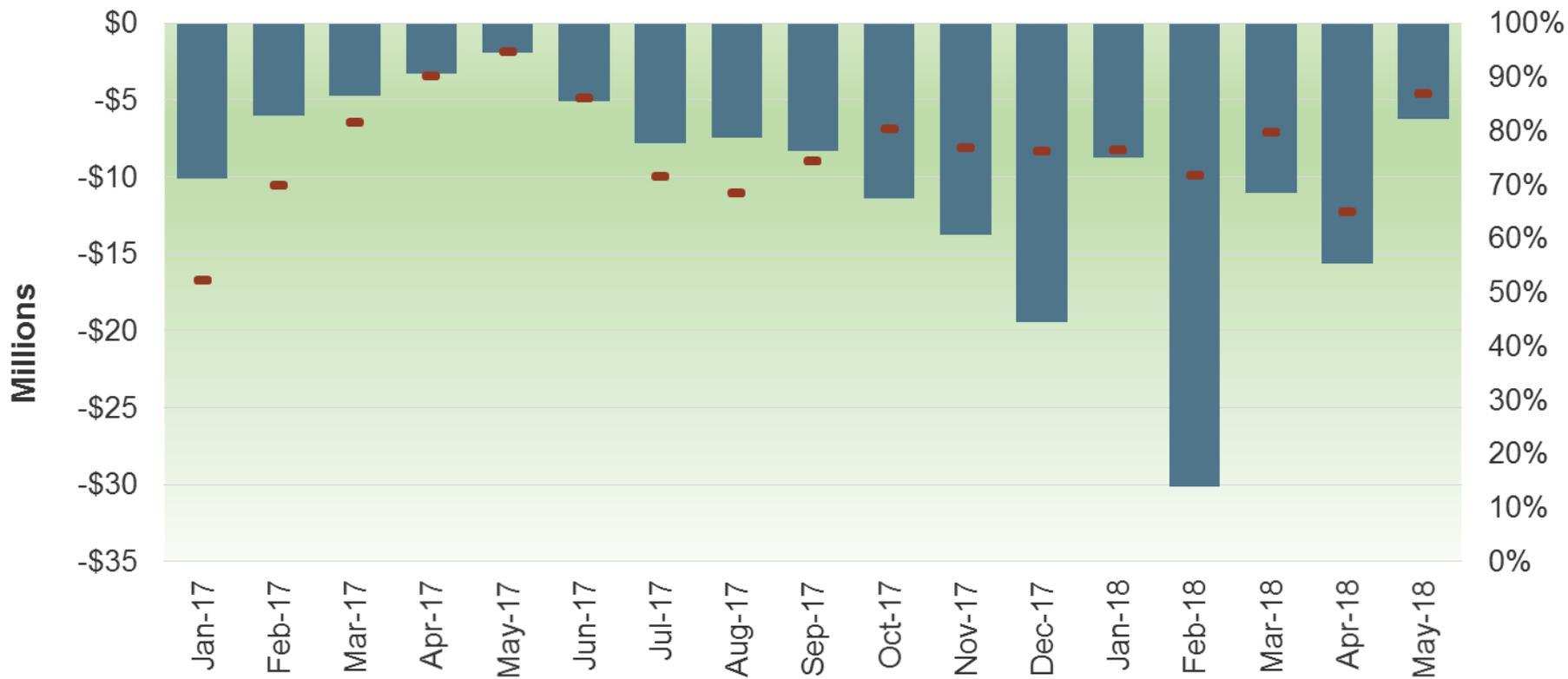
Uncertainty Movement Down Settlement



Load Conformance patterns do not show yet a meaningful difference with the FRP fixes introduced



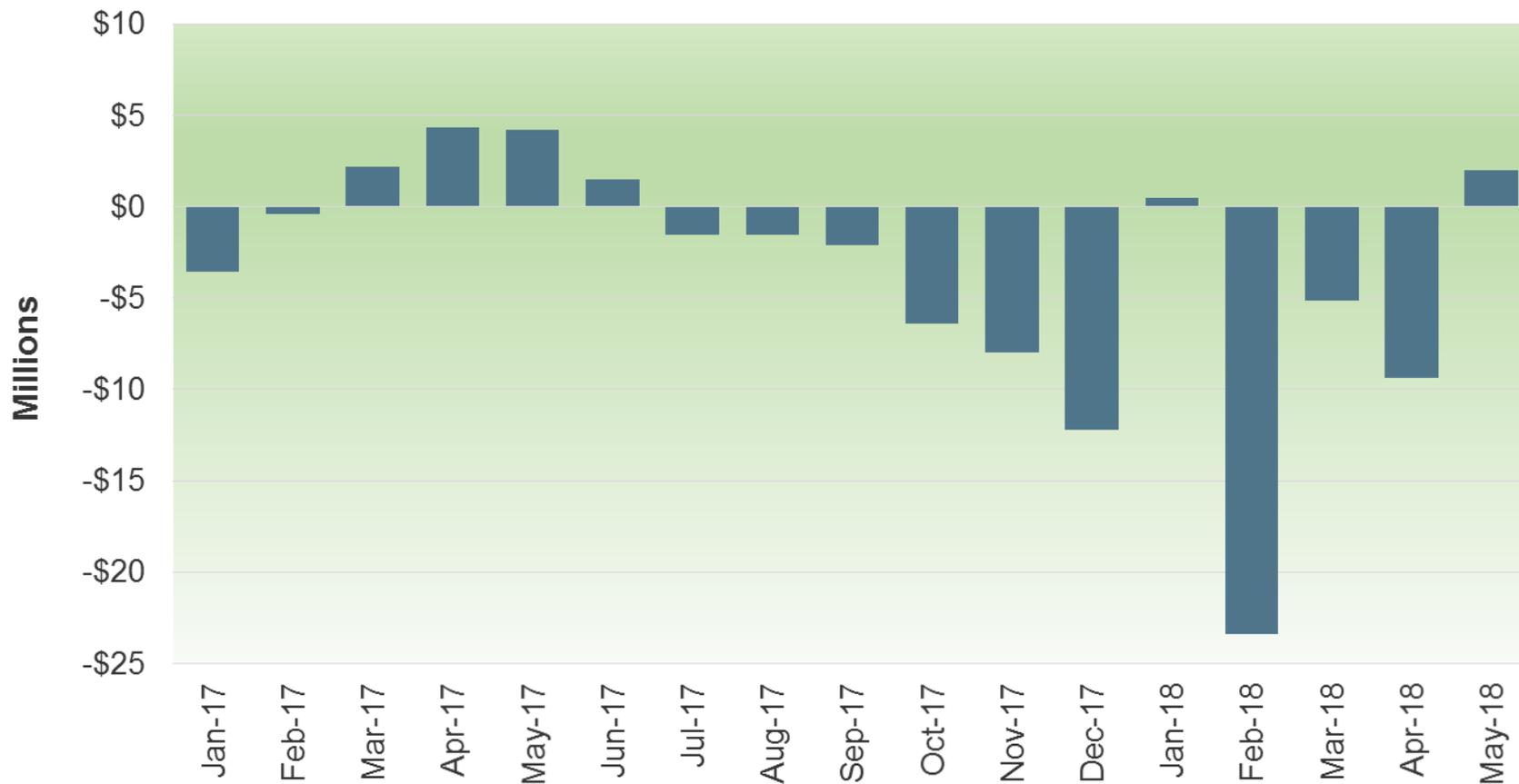
Congestion revenue rights market revenue inadequacy without auction revenues.



CRR revenue adequacy does not include monthly and annual auction revenues.

■ Revenue Adequacy ● Percent of Revenue Adequacy

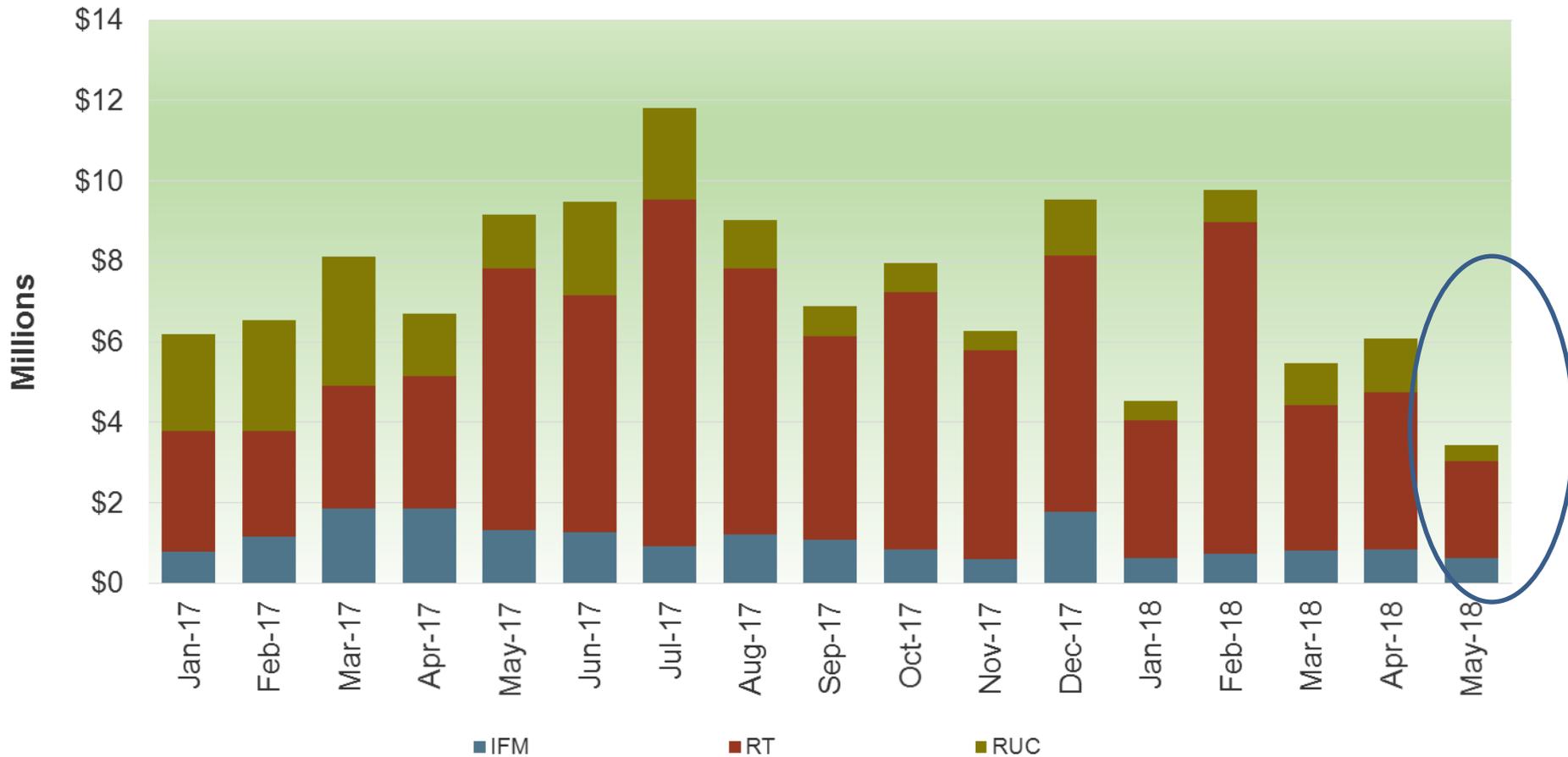
Congestion revenue rights market revenue sufficiency including auction revenues.



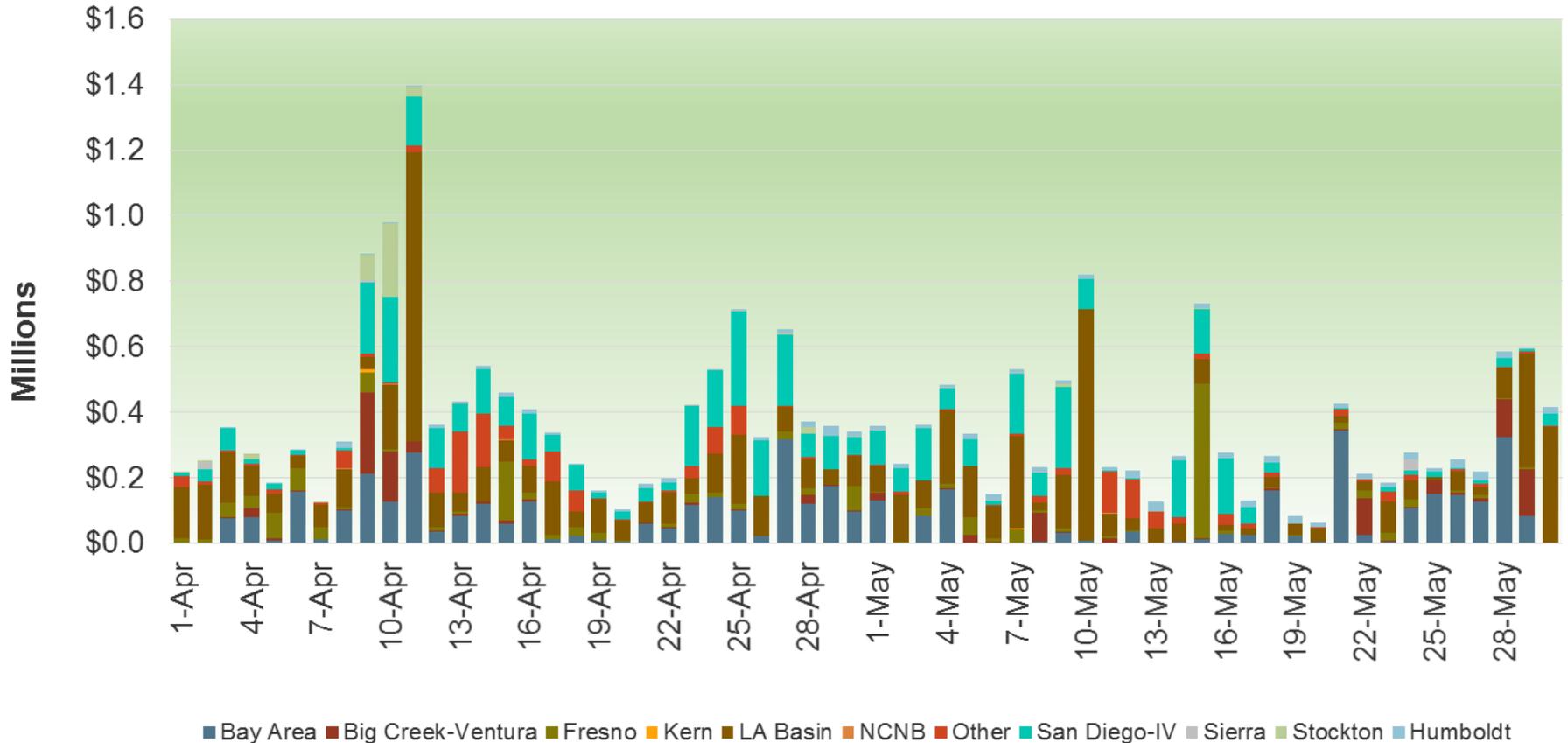
Exceptional dispatch volume in the ISO area remain at low levels in April and May



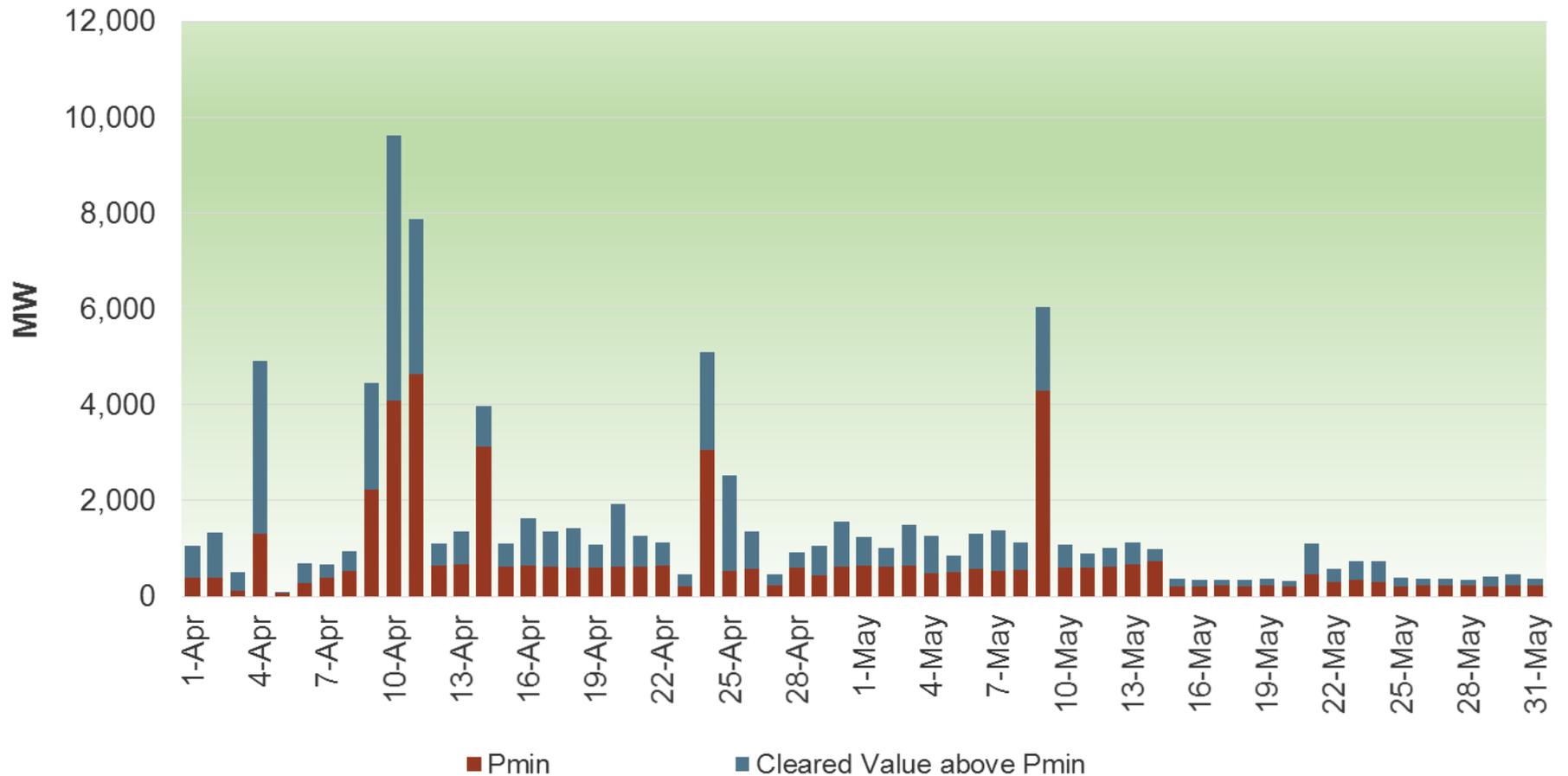
Real-time Bid cost recovery dropped in May



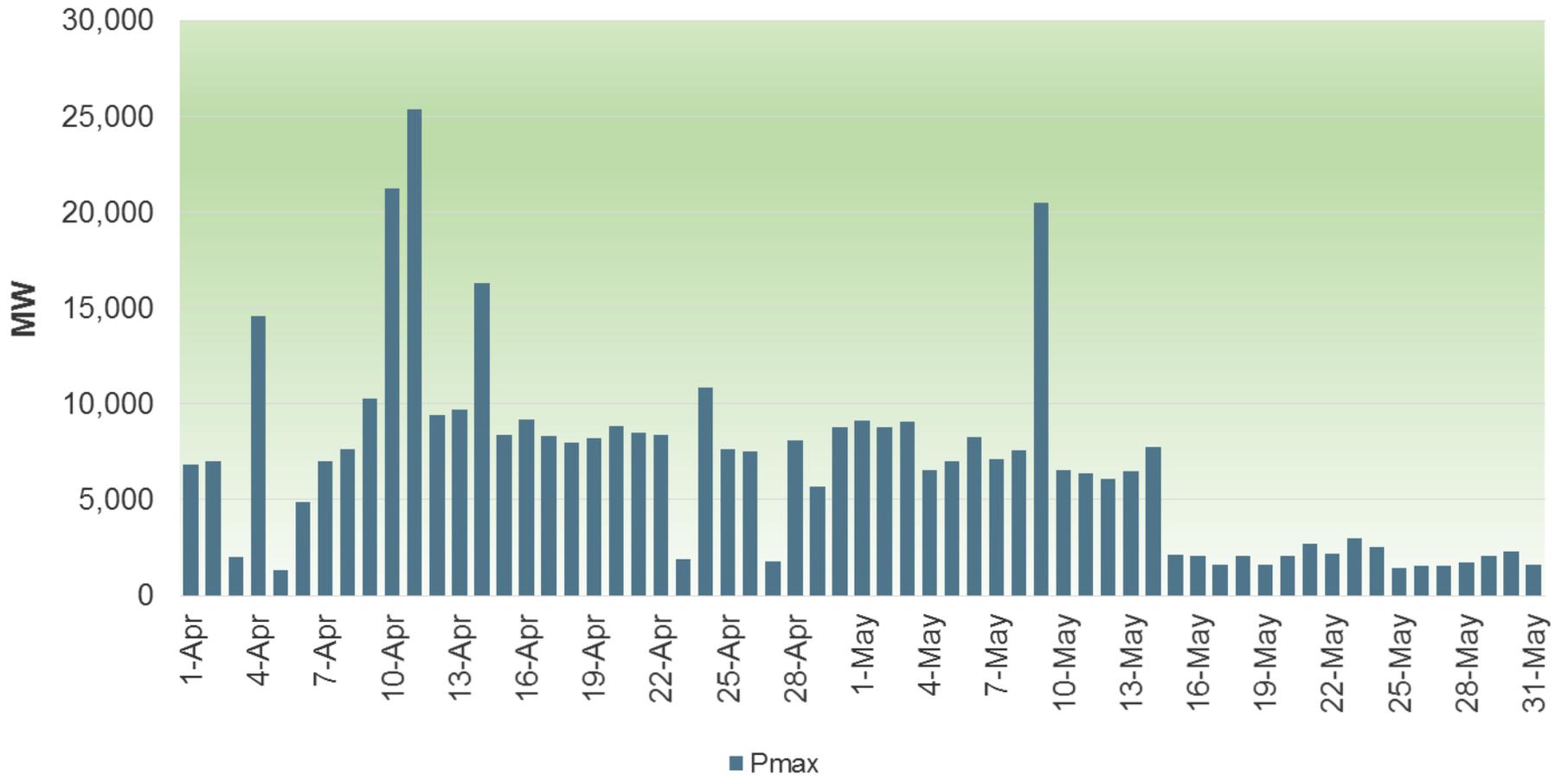
Bid cost recovery (BCR) by Local Capacity Requirement area



Minimum online commitment (MOC)



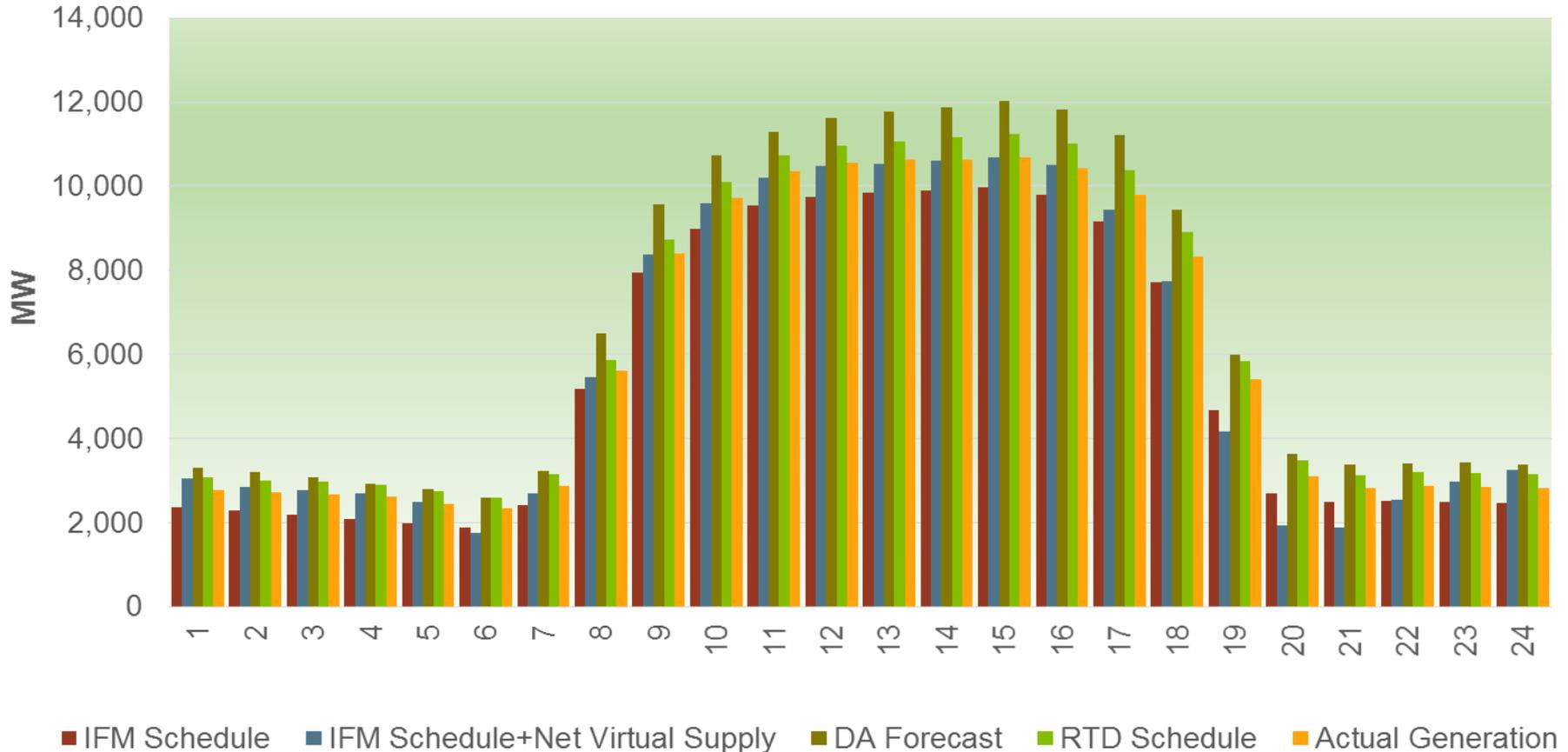
Pmax of MOC Cleared Units



Enforcement of minimum online commitments in April and May

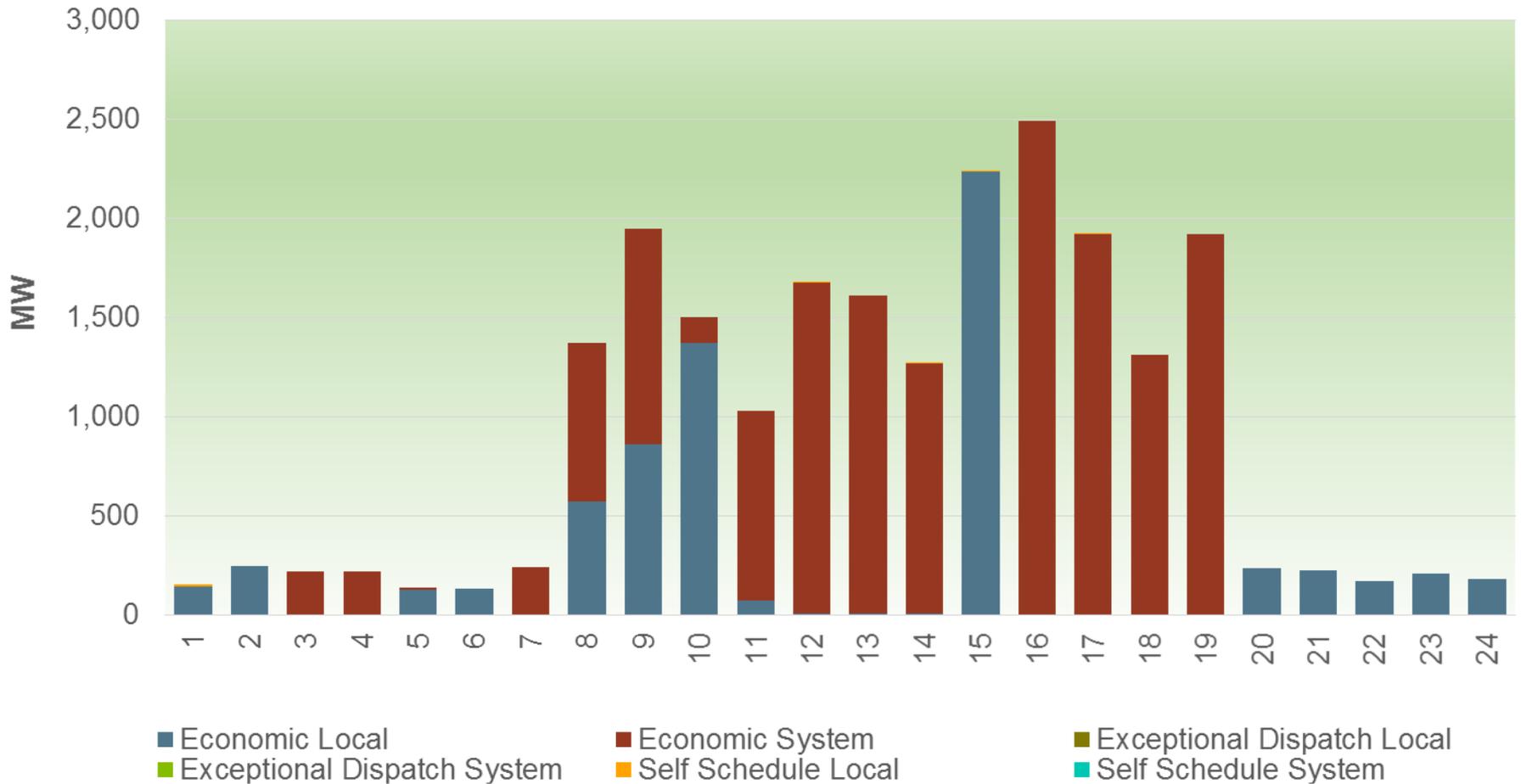
MOC Name	Number (frequency) of hours in April and May
Humboldt 7110 SVC In	1179
MOC Mesa-Redondo 5506738	920
Orange County 7630	161
MOC SAN ONOFRE BUS	82
MOC Palermo 5800836	22
MOC NP15	13
MOC TBLMTN CB632 5652544	4

Renewable (VERS) schedules including net virtual supply aligns with VER forecast in April and May

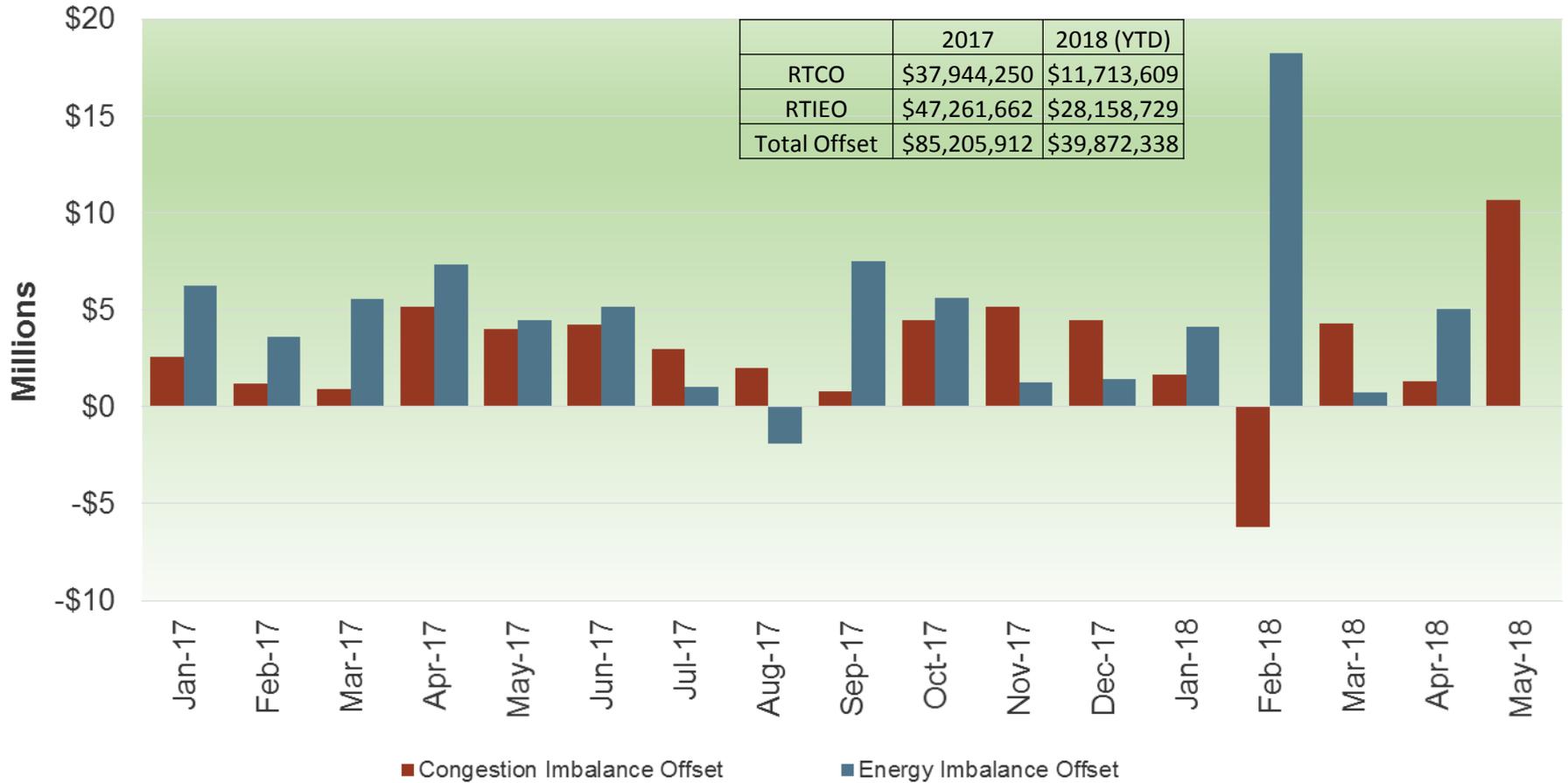


<http://www.aiso.com/Pages/documentsbygroup.aspx?GroupID=EFF75C2E-F28E-4087-B88B-8DFFAED828F8>

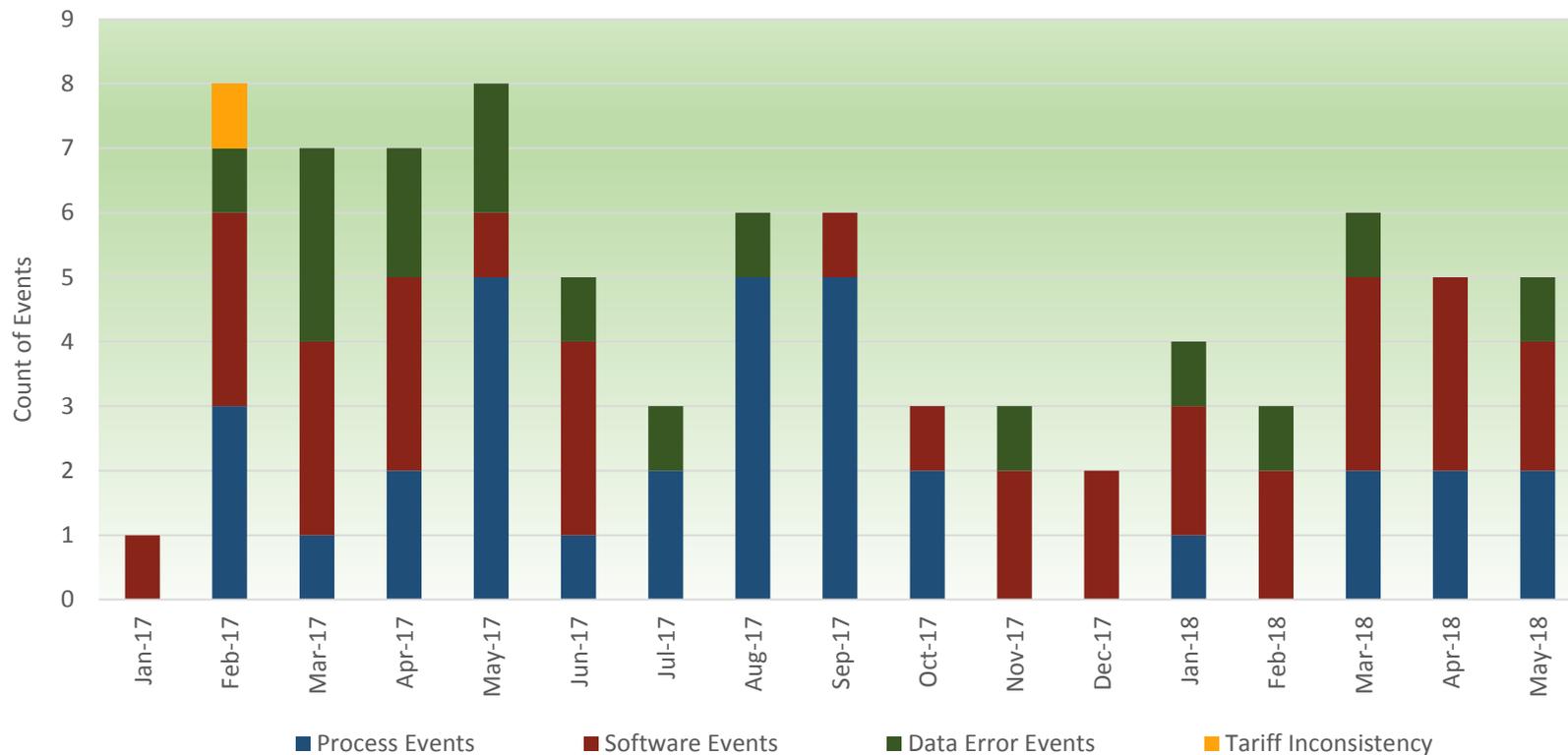
Hourly distribution of maximum RTD renewable (VERS) curtailment in May



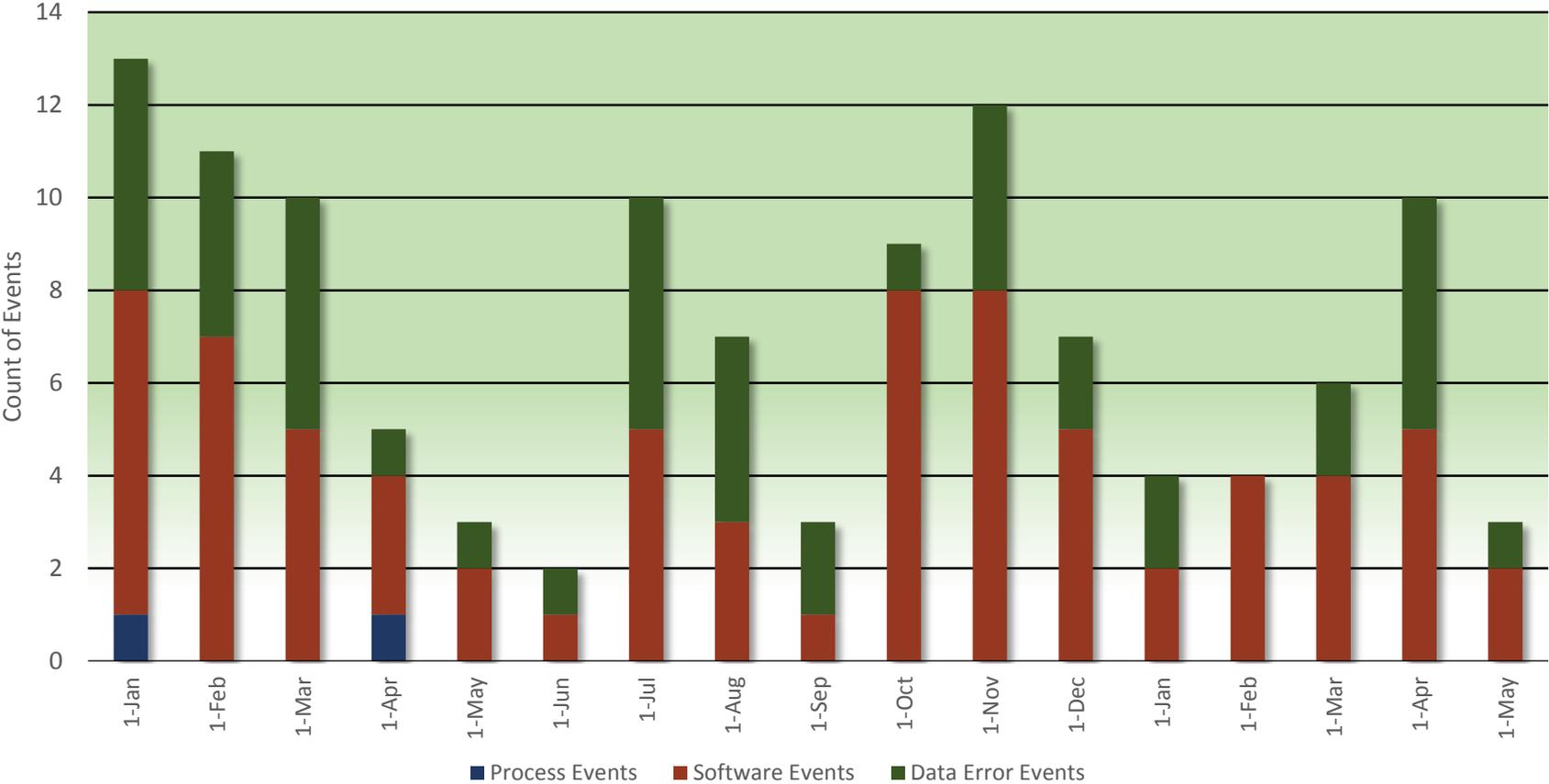
ISO area RTIEO fell in May



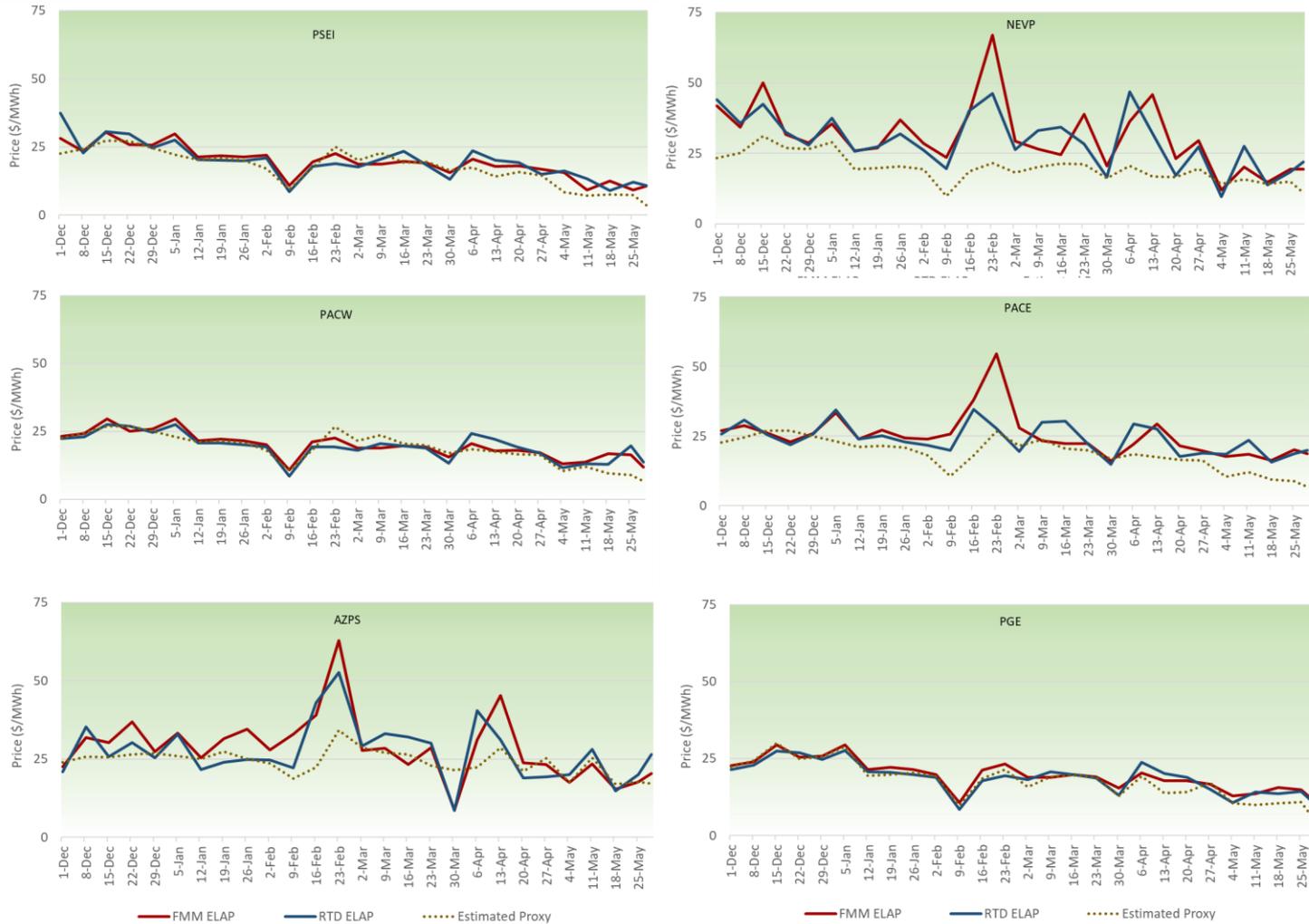
CAISO Price correction events remain consistent in April and May



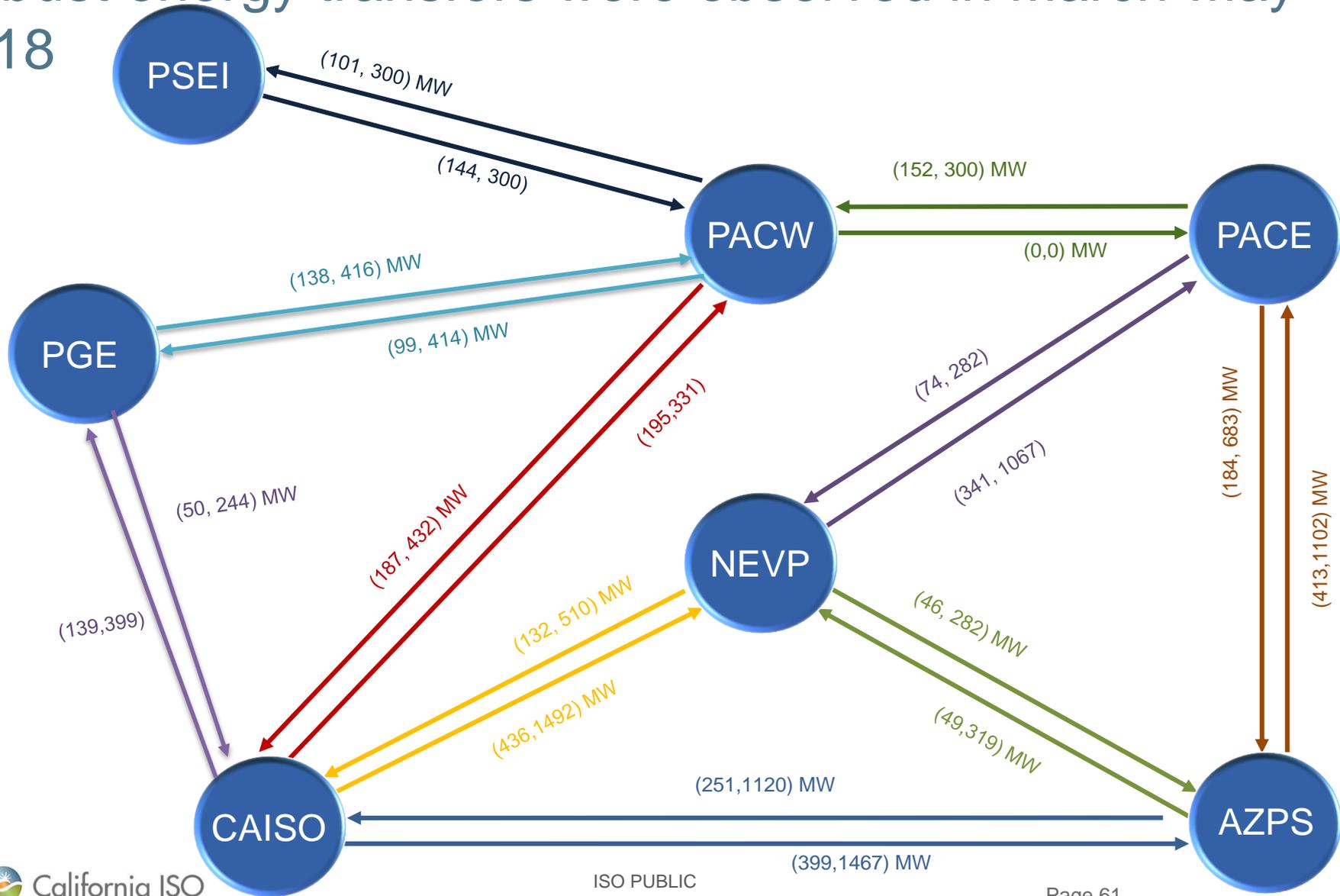
EIM-Related Price correction events increased in April



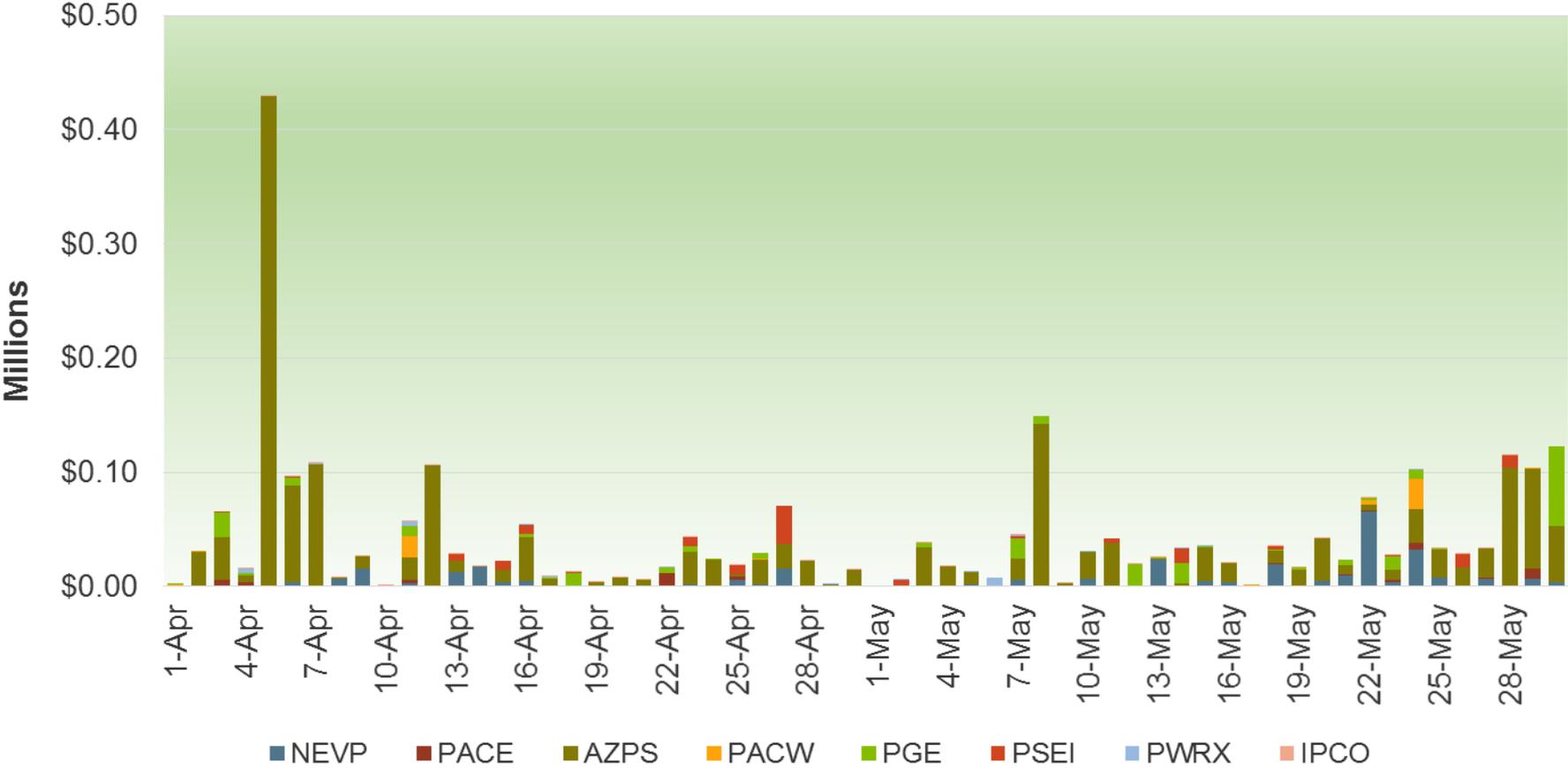
EIM prices were generally stable



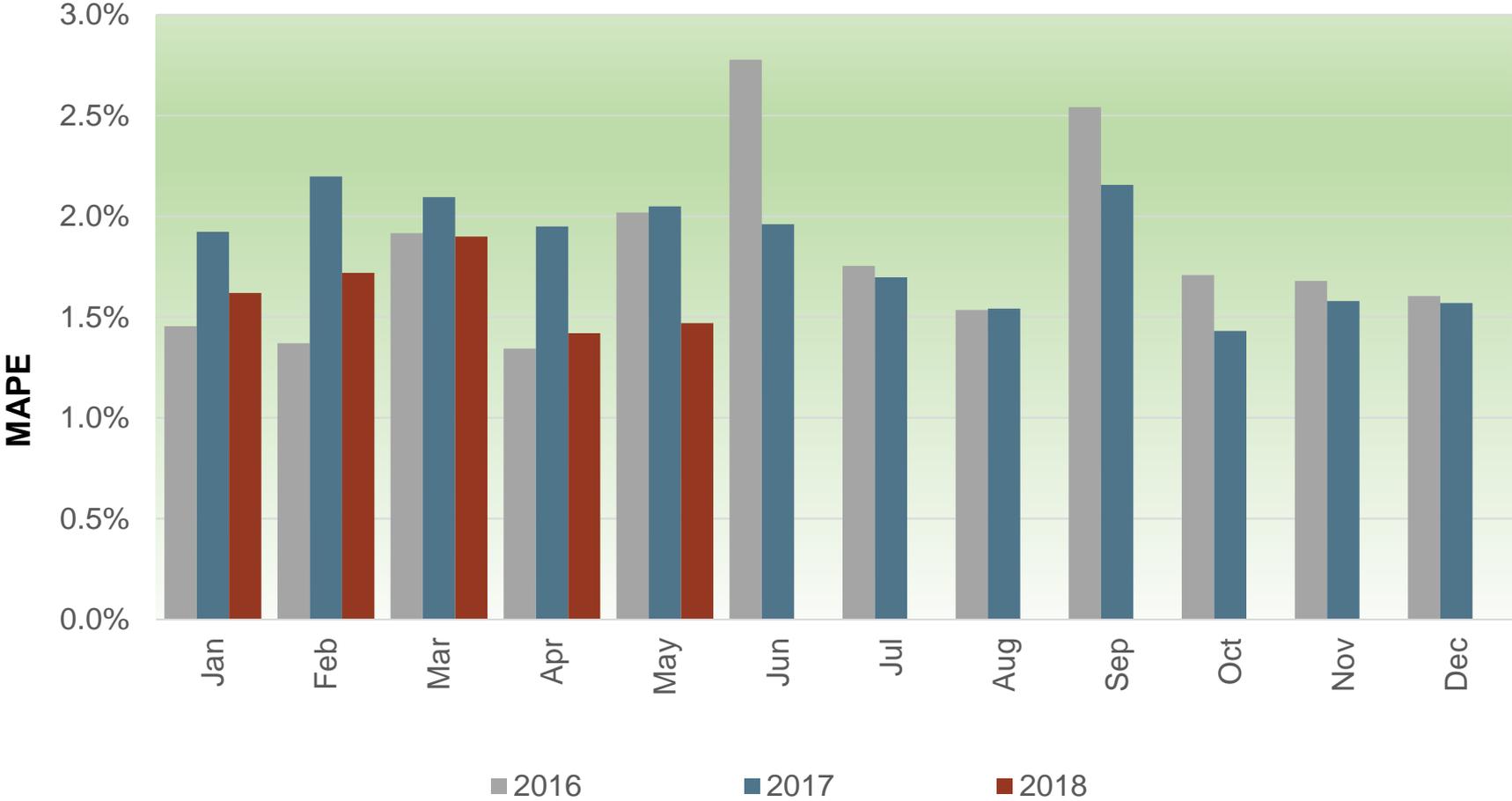
Robust energy transfers were observed in March-May 2018



EIM BCR increased slightly in April compared with March



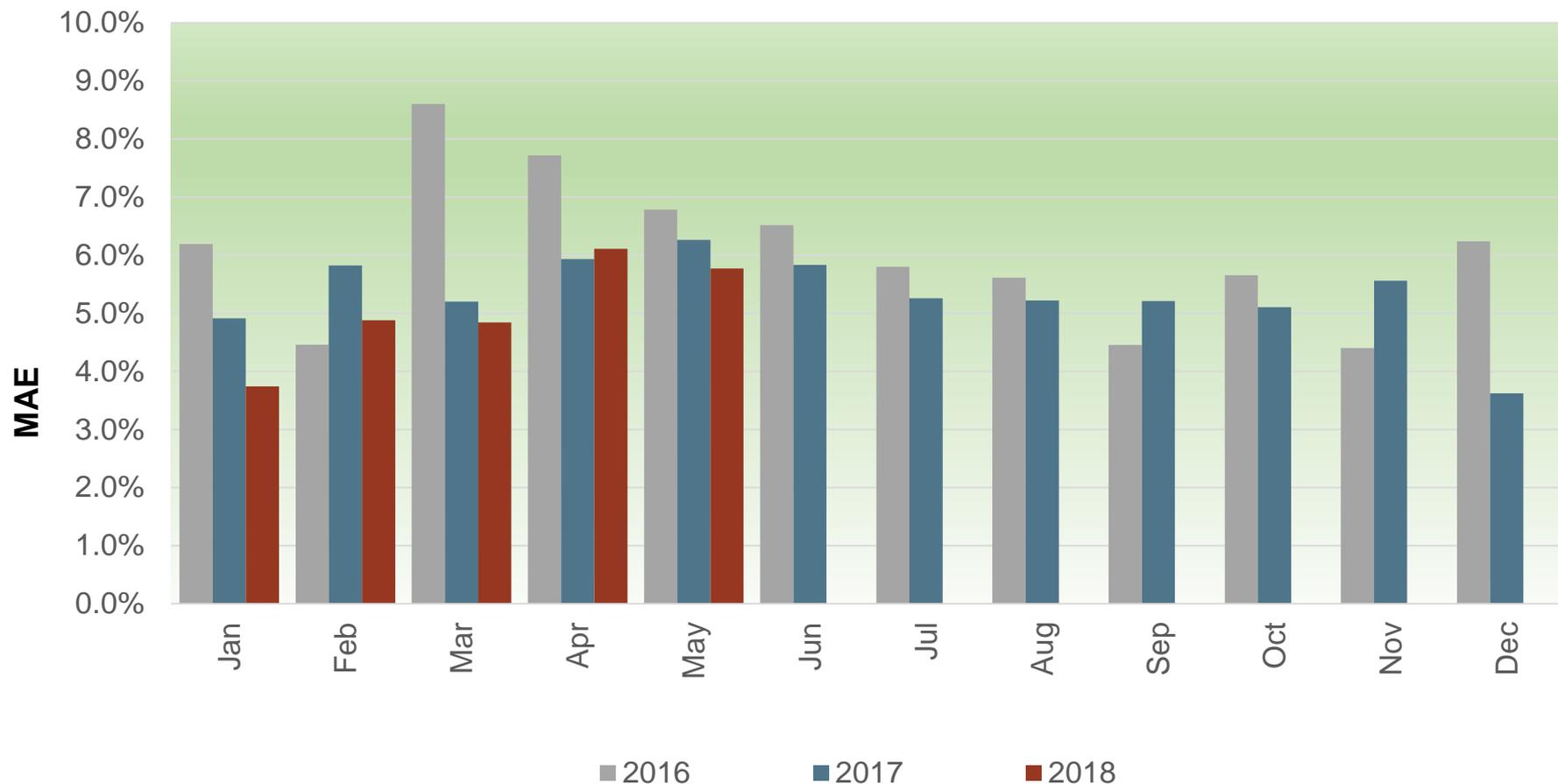
Day-ahead load forecast



Day-ahead peak to peak forecast accuracy



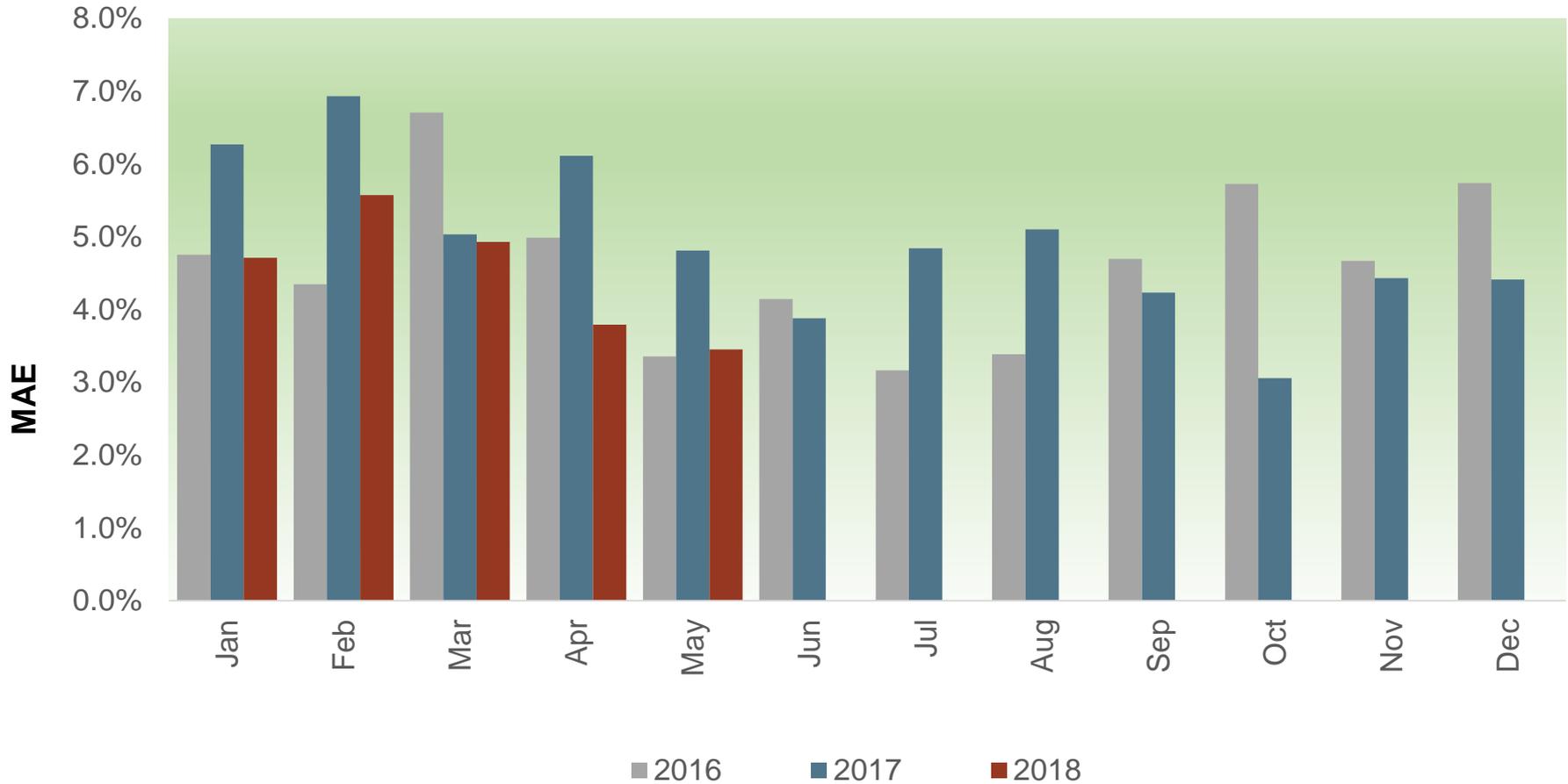
Day-ahead wind forecast



**In 2015-2016, Economic dispatches are not added back in to the generation data.

**The 2017 generation data used for accuracy calculation contains the economically dispatched MW.

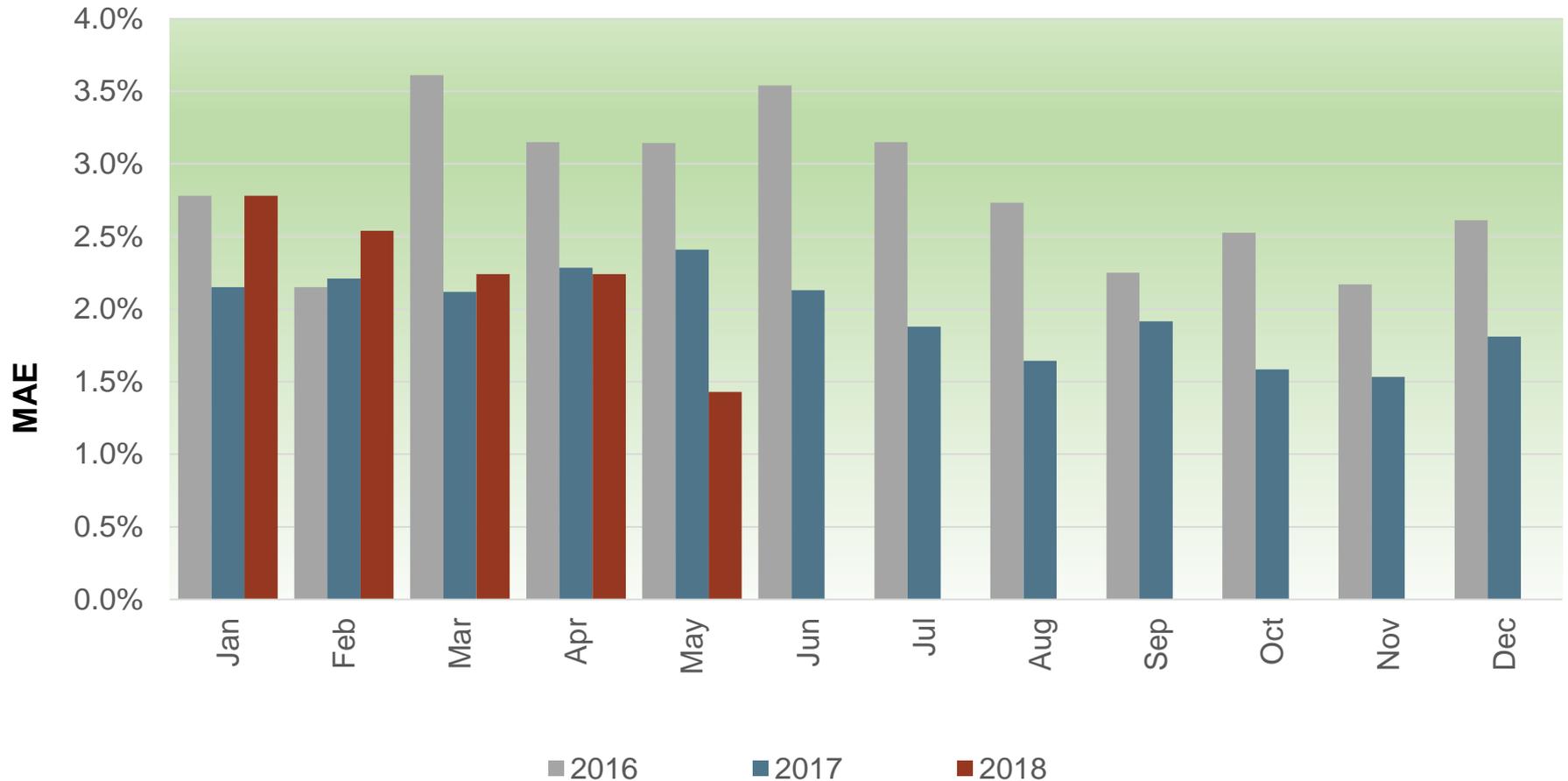
Day-ahead solar forecast



**In 2015-2016, Economic dispatches are not added back in to the generation data.

**The 2017 generation data used for accuracy calculation contains the economically dispatched MW.

Real-time wind forecast



**2015-2016 represent the accuracy of the forecast made each hour at xx:55 for the following hour, i.e. the 5-65 minute ahead forecast. Economic dispatches are not added back in to the generation data.

**2017 has been changed to track the RTD accuracy, i.e. the forecast made 7.5 minutes before the binding interval. The 2017 generation data used for accuracy calculation contains the economically dispatched MW.

**This forecast accuracy is pulled directly from the CAISO Forecasting System.

Real-time solar forecast



**2015-2016 represent the accuracy of the forecast made each hour at xx:55 for the following hour, i.e. the 5-65 minute ahead forecast. Economic dispatches are not added back in to the generation data.
 **2017 has been changed to track the RTD accuracy, i.e. the forecast made 7.5 minutes before the binding interval. The 2017 generation data used for accuracy calculation contains the economically dispatched MW.
 **This forecast accuracy is pulled directly from the CAISO Forecasting System.

Policy Update

Brad Cooper

Manager, Market Design Policy

John Goodin

Manager, Infrastructure & Regulatory Policy

Ongoing policy stakeholder initiatives

- Congestion revenue right auction efficiency
 - Track 1A filed with FERC on April 11
 - Track 1B draft final proposal addendum posted on May 25
 - June 2018 CAISO Board Meeting for Track 1B proposal
 - Track 2 schedule TBD
- Day ahead market enhancements
 - EIM Governing Body hybrid non-EIM specific approval role
 - Posted straw proposal on April 11
 - Working group on June 19
 - October EIM Governing Body and November ISO Board meeting

Ongoing policy stakeholder initiatives (continued)

- EIM greenhouse gas attribution enhancements
 - EIM Governing Body primary approval role
 - Third revised draft final proposal posted June 6
 - July EIM Governing Body meeting
 - July ISO Board meeting consent agenda
- Extended STUC
 - EIM Governing Body hybrid non-EIM specific approval role
 - Draft final proposal posted June 13
 - July EIM Governing Body meeting
 - July ISO Board meeting

Ongoing policy stakeholder initiatives (continued)

- EIM Offer Rules
 - Workshop on April 30
 - Second workshop in July
- Review Transmission Access Charge (TAC) structure
 - Post second revised straw proposal June 21
 - Stakeholder meeting June 28
 - Post draft final proposal September 2018
 - CAISO Board Meeting Q1 2019 (tentative)

Ongoing policy stakeholder initiatives (continued)

- Flexible Resource Adequacy Criteria and Must-Offer Obligation (Phase 2)
 - Aligning with DA market Enhancements- Imbalance Reserve
 - Draft flexible capacity framework submitted into CPUC's RA proceeding
 - Final framework proposal July 10, 2018 (also submitted to CPUC's RA proceeding)
 - Stakeholder meeting and working group June 18, 2018
 - CAISO Board meeting November, 2018

Ongoing policy stakeholder initiatives (continued)

- Energy Storage and Distributed Energy Resources (ESDER) (Phase 3)
 - July 2018 post draft final proposal
 - August 2018 EIM Governing Body Meeting – advisory
 - September 2018 CAISO Board Meeting
- Review of RMR and CPM
 - Implement in June increased transparency when ISO receives a notice of planned retirement of a resource
 - May 30 working group meeting completed
 - June 1 ISO filed its first quarterly status report to FERC
 - June 26 post straw proposal
 - July 11 hold stakeholder meeting

Ongoing policy stakeholder initiatives (continued)

- **Storage as a Transmission Facility (SATA)**
 - Straw proposal in early May 18, 2018
 - Stakeholder meeting May 24, 2018 (stakeholder comments due June 7, 2018)
 - Stakeholder working group June 29, 2018
 - November 2018 CAISO Board meeting

Upcoming policy stakeholder initiatives

- Intertie Deviation Settlement
 - Issue paper scheduled for July

Release Plan Update

Adrian Chiosea

Manager, Strategic Initiative Management

Janet Morris

Director, Program Office

The ISO offers innovative training programs

Date	Training <small>All classes are offered at our Folsom, CA campus unless noted otherwise</small>
July 18	Welcome to the ISO webinar
August 14-15	Get to Know the ISO
September 13	Settlements 101
September 14	Settlements 201



The ISO's External Training & Readiness team provides quality training and readiness programs that successfully prepare Stakeholders to effectively engage with the ISO

New Release Training materials currently posted
Welcome to the ISO recorded webinar
Resource Interconnection Management System (RIMS) Generation Module
Scheduling Infrastructure Business Rules (SIBR) User Interface (UI) Update
RSI: Outage Substitution and RAAIM Pre-Calc
Energy Imbalance Market Winter Release 2017
Reliability Services Initiative (RSI) Training Phase 1B & 2

Visit our **Learning Center** web page to access our training calendar, register for courses and find other useful resources, including computer based training courses, recorded webinars and new release training materials at:

<http://www.caiso.com/participate/Pages/LearningCenter/default.aspx>

Contact us: CustomerTraining@caiso.com

Release Plan Summary: 2018

Spring 2018

- Resource Adequacy Availability Incentive Mechanism (RAAIM) Calculation Modifications

Independent 2018

- Imbalance Conformance Enhancements (ICE)
- Congestion Revenue Right Auction Efficiency 1B

Fall 2018

- Green House Gas (GHG) Enhancements for EIM
- Settlements Performance Improvements
- Energy Storage and Distributed Energy Resources (ESDER) Phase 2
- Generator Contingency and Remedial Action Scheme (RAS) Modeling
- Congestion Revenue Right (CRR) Auction Efficiency 1A
- EIM 2018 Enhancements
- Extended STUC
- Commitment Cost Enhancement (CCE) Phase 3

Release Plan Summary: 2019 – Spring 2020

Independent 2019

- Automated Dispatch System (ADS) User Interface (UI) Replacement
- Black Start and System Restoration Phase 2

Spring 2019

- Energy Imbalance Market (EIM) 2019 Balancing Authority of Northern California (BANC) / Sacramento Municipal Utility District (SMUD)

Fall 2019 – tentative, subject to impact assessment

- Contingency Modeling Enhancements - Transmissions
- Commitment Costs and Default Energy Bid Enhancements (CCDEBE)
- Flexible Resource Adequacy Criteria and Must-offer Obligation (FRACMOO) Phase 2
- Energy Storage and Distributed Energy Resources (ESDER) Phase 3
- Review of Transmission Access Charge (TAC) Billing Structure
- Day-Ahead Market Enhancements

Spring 2020

- Energy Imbalance Market (EIM) 2020 Salt River Project
- Energy Imbalance Market (EIM) 2020 Seattle City Light
- Energy Imbalance Market (EIM) 2020 Los Angeles Dept. of Water and Power

TBD – tentative, subject to impact assessment

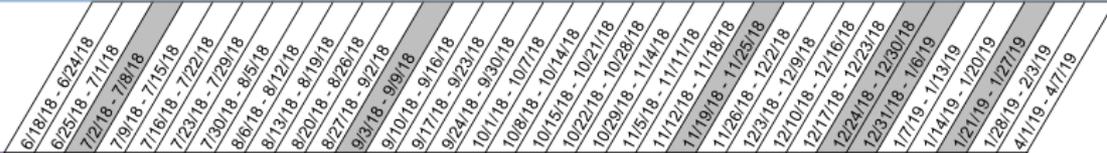
- Clarification of Tariff Rules Regarding Following DOT
- Review of RMR and CPM
- Storage as a Transmission Facility
- Intertie Deviation Settlement
- EIM Offer Rules

Release Schedule 2018 – Spring 2019

Date of Data Refresh: 6/1/18 1:01 PM



Legend	
Market Simulation	Orange
CA ISO Holiday	Grey
Deployment Week	Blue



Map Stage Environment Window

Item	Start Date	End Date
FNM Promotion 2018Q2	06/20/18	06/21/18
CRR Auction Efficiency 1A	08/01/18	10/15/18
EIM - BANC-SMUD	08/15/18	01/31/19
Extended STUC	08/17/18	10/01/18
ESDER Phase 2	08/17/18	10/02/18
Generator Contingency and RAS Modeling	08/17/18	09/28/18
CCE3 September Full Market Testing	08/20/18	09/24/18
CCE3 September Full Market Testing - Market Sim	08/20/18	09/28/18
EIM Enhancements 2018	08/20/18	09/28/18
EIM Enhancements 2018 - Market Sim	08/20/18	09/28/18
Settlements Performance Improvements	08/20/18	09/28/18
Settlements Performance Improvements - Market Sim	08/20/18	09/28/18
ESDER Phase 2 - Market Sim	08/20/18	09/28/18
Extended STUC - Market Sim	08/20/18	09/28/18
CRR Auction Efficiency 1A - Market Sim	08/20/18	09/28/18
Generator Contingency and RAS Modeling - Market Sim	08/20/18	09/28/18
FNM Promotion 2018Q3	09/19/18	09/20/18
EIM - BANC-SMUD - Market Sim	12/03/18	01/30/19
FNM Promotion 2018Q4	12/11/18	12/12/18

PROD Environment Window

Item	Start Date	End Date
RAAIM Implementation Update	07/01/18	07/01/18
2016 OPS-Tech ALT	08/03/18	08/03/18
Back-end and ECIC UI drop	08/13/18	08/13/18
FNM Promotion 2018Q3	08/21/18	08/23/18
Imbalance Conformance Enhancements	09/10/18	09/10/18
Green House Gas Enhancements for EIM	10/01/18	10/01/18
EIM Enhancements 2018	11/01/18	11/01/18
Settlements Performance Improvements	11/01/18	11/01/18
Master File GRDT Clarifications	11/01/18	11/01/18
Discontinue Min/Worst Ramp Rate	11/01/18	11/01/18
CCE3 Activation in Production: Full Scope	11/01/18	11/01/18
CRR Auction Efficiency 1A	11/01/18	11/01/18
Extended STUC	11/01/18	11/01/18
ESDER Phase 2	11/01/18	11/01/18
Generator Contingency and RAS Modeling	11/01/18	11/01/18
FNM Promotion 2018Q4	11/27/18	11/29/18
EIM - BANC-SMUD	04/03/19	04/03/19

<http://www.caiso.com/Documents/ReleaseSchedule.pdf>



ISO PUBLIC

2018 Spring Release

Spring 2018 – RAIM Calculation Modifications

Project Info	Details/Date
Application Software Changes	<p>RAAIM (Resource Adequacy Availability Incentive Mechanism) – California ISO intends to release a new RAIM Calculation Modifications within the Settlements system.</p> <p>The fix properly weights flexible capacity for both relative (in percent) and absolute (in MW) availability, as compared to generic capacity in a resource’s total availability.</p> <p>For Configuration Guides, please refer to CG PC RA Availability Incentive Mechanism v5.4, CC 8830 v5.2, and CC 8831 v5.1.</p>

Milestone Type	Milestone Name	Dates	Status
Configuration Guide	Draft Technical Documents (Draft Settlements BPM)	Nov 8, 2017	✓
Configuration Output File	Draft Configuration Output File (updated version will be provided prior to Market Sim)	Nov 22, 2017	✓
BPMs	Post BPM Changes - Settlements & Billing	Feb 7, 2018	✓
External Validation	New calculation will be deployed into Production as advisory beginning 5/1/2018	May 1, 2018	✓
Market Sim	Market Simulation (Additional trade date 3/7 and 3/8 Includes mini-monthly)	Jan 16 – Mar 8, 2018	✓
Production Deployment	Implement and deploy into Production revised charge codes per Winter release deployment plan.	Jun 1, 2018	✓
Production Activation	Revised RAIM penalties and incentives become financially binding on 7/1/2018 going forward.	July 1, 2018	

2018 Independent Projects

2018 – Imbalance Conformance Enhancements

Project Info	Details/Date
Application Software Changes	<p>Improve RTPD, RTD limiter algorithm to better adjust for factors before and after conformance (Inc. VER deviations; other patterns observed from conformance studies; and after conformance value entered - ramping across multiple intervals rather than today's one interval). In scope for 2018.</p> <p>Provide a new or enhanced UI for operators to make more accurate conformance decision making and interact more precisely in conformance scenarios. Delivery in 2019.</p>
BPM Changes	Definitions & Acronyms BPM will be impacted if Policy directs that. The ISO is replacing the term 'load biasing' with 'imbalance conformance'

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	May 16, 2018	✓
Tariff	File Tariff	Jun 28, 2018	
Config Guides	Post Config Guides	N/A	
BPMs	Post Draft BPM changes	TBD	
Tech Spec	Publish Technical Specifications	N/A	
Market Sim	Market Sim Window	N/A	
Production Activation	Imbalance Conformance Enhancements for 2018	Sep 10, 2018	

2018 - CRR Auction Efficiency – 1B

Project Info	Details/Date
Application Software Changes	TBD – Policy development and Impact Analysis in progress
BPM Changes	TBD
Business Process Changes	TBD

2018 Fall Release

Fall 2018 Release – Overview

	Board Approval	External BRS	Config Guide	Tech Spec	Tariff	BPMs	External Training	Market Sim	Production Activation
Fall 2018 Release - Overview	01/01/18	05/22/18	06/22/18	06/22/18	08/01/18	08/10/18	08/13/18	Aug 20, 2018 - Sep 28, 2018	11/01/18
Commitment Costs Phase 3	03/25/16	08/21/17	05/17/18	11/30/17	03/23/18	08/10/18	08/02/18	Aug 20, 2018 - Sep 28, 2018	11/01/18
Green House Gas Enhancements for EIM	07/25/18	05/30/18	N/A	N/A	TBD	TBD	TBD	Aug 20, 2018 - Sep 28, 2018	11/01/18
Settlements Performance Improvements	N/A	02/20/18	N/A	N/A	N/A	N/A	08/10/18	Aug 20, 2018 - Sep 28, 2018	11/01/18
ESDER Phase 2	07/26/17	03/01/18	05/18/18	05/21/18	08/01/18	08/06/18	08/07/18	Aug 20, 2018 - Sep 28, 2018	11/01/18
Generator Contingency and RAS Modeling	09/19/17	03/16/18	N/A	N/A	06/20/18	08/10/18	08/10/18	Aug 20, 2018 - Sep 28, 2018	11/01/18
CRR Auction Efficiency 1A	03/22/18	05/11/18	TBD	N/A	04/09/18	08/10/18	07/31/18	Aug 20, 2018 - Sep 28, 2018	11/01/18
EIM Enhancements 2018	N/A	06/01/18	N/A	06/11/18	N/A	07/09/18	08/13/18	Aug 20, 2018 - Sep 28, 2018	11/01/18
Extended STUC	07/25/18	06/06/18	N/A	N/A	08/01/18	08/10/18	08/13/18	Aug 20, 2018 - Sep 28, 2018	11/01/18

Notes:

*TBD items may be inapplicable, or they may have undetermined dates

Items in BLUE are **complete**

Items in RED indicate a **new** date which is later than the target date listed on the Overview line.

Fall 2018 - Commitment Cost Enhancements Phase 3

Project Info	Details/Date
Application Software Changes	<p>Scope:</p> <ol style="list-style-type: none"> 1. Clarify use-limited registration process and documentation to determine opportunity costs 2. Determine if the ISO can calculate opportunity costs <ul style="list-style-type: none"> • ISO calculated; Modeled limitation Start/run hour/energy output • Market Participant calculated; Negotiated limitation 3. Clarify definition of “use-limited”; <i>add MSG Configuration ID to ULPDT</i> 4. Change Nature of Work attributes (Outage cards) <ul style="list-style-type: none"> • Modify use-limited reached for RAAIM Treatment • Allow PDR to submit use-limit outage card for fatigue break. 5. Market Characteristics (<i>to be added to GRDT</i>) <ul style="list-style-type: none"> • Maximum Daily Starts • Maximum MSG transitions • Ramp rates <p>Impacted Systems:</p> <ol style="list-style-type: none"> 1. Master File: Set use-limited resource types and limits; Set market-based values 2. ECIC: Process use limited resource input values for and Receive opportunity cost adders from opportunity cost tool 3. CIRA: RAAIM exempt rule for “use-limited reached” 4. CMRI: Publish opportunity cost 5. IFM/RTN: Use market-based values MDS, MDMT and RR 6. SIBR: Add Opportunity cost adders on bid caps, remove daily bid RR 7. OMS: “Use-Limited Reached” nature of work attribute for Generation Outage Card 8. Settlements: Publish the actual start up, run hour and energy output for the use-limited resources 9. Opportunity cost calculator (OCC): Calculate and publish opportunity costs for start-up, MLC and DEB
BPM Changes	Market Instruments, Outage Management, Reliability Requirement, Market Operations
Business Process Changes	<ul style="list-style-type: none"> • Manage Market & Reliability Data & Modeling • Manage Markets & Grid

Fall 2018 - Commitment Cost Enhancements Phase 3 (cont.)

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board of Governors (BOG) Approval	Mar 25, 2016	✓
External BRS	Post Updated External BRS	Aug 21, 2017	✓
Tech Spec	Publish Updated Technical Specifications	Nov 30, 2017	✓
Tariff	File Tariff	Mar 23, 2018	✓
Config Guides	Config Guide	May 18, 2018	✓
BPMs	Post Draft BPM changes	Aug 14, 2018	
External Training	Deliver External Training	Aug 28, 2018	
Market Simulation	March Master File Market Simulation Testing	Mar 26, 2018 - May 04, 2018	✓
	September Full Market Simulation	Aug 20, 2018 - Sep 28, 2018	
Production Activation	CCE3 Activation in Production: Full Scope	Nov 01, 2018	
	CCE3 Deployment to Production: Master File	May 16, 2018	✓

Fall 2018 - Commitment Cost Enhancements Phase 3 (cont.)

Next Steps for Evaluating Opportunity Costs

What do I need to do?

- CAISO will initiate contact
- Begin reviewing Use Limit Registration (ULR) values, collect documentation for Use Limit status for review

How will I be contacted?

- Scheduling Coordinators (SCs) will be contacted by their Client Representative via phone, with follow-up via phone/email; this will be tracked by CIDI ticket.
- By end of June, Use Limit Registration efforts will be complete. After June end, CAISO will begin sharing opportunity costs for review. Market Notices will clarify dates and deadlines.

What information will I receive?

- Market Participants will see opportunity cost data during Market Simulation testing
- Client reps will review opportunity costs via phone and email; Market Notices will help guide ULR

How soon do I need to respond after being contacted?

- No particular date requirements; details will be provided once CAISO initiates contact and will be case-by-case

Who do I contact for corrections, changes, or questions?

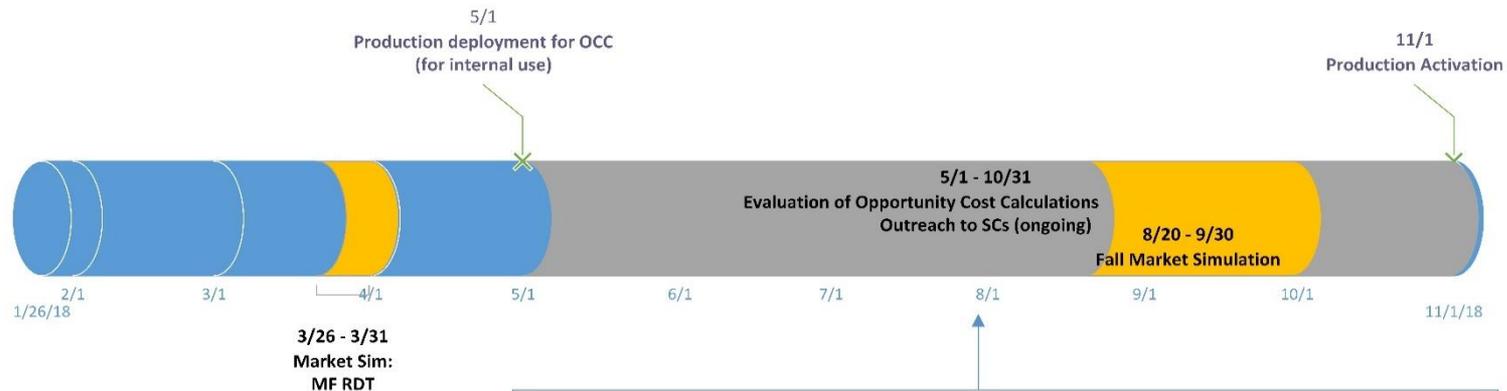
- Please contact your Client Representative

What will I see during Market Simulation?

- Market Participants will see posted values; the focus is not the actual number, as it will be realistic but not exact
- Focus during Market Simulation will be on publishing values through to CMRI and that the process and application(s) meet expectations
- Validation of specific values will be part of the discussion held prior to Market Simulation via the communication process outlined above

Fall 2018 - Commitment Cost Enhancements Phase 3 (cont.)

CCE3: Project Timeline, Deployment Dates, Major Milestones



Discovery/Evaluation Timeframe: Expectations

- New process to be defined; primarily an internal CAISO effort
- CAISO will identify resources impacted, type of constraints they have, and what time of eligibility period they will declare (monthly, annual, rolling)
- CAISO will then identify the formulation for calculation of opportunity costs (i.e. types of constraints that fit into model)
- CAISO can then validate the type of constraint declared and how constraints are translated into any of the three defined model constraints in the system
- CAISO will also be able to separate the resources that go into formula-based calculation versus resources that fall into negotiated opportunity costs.
 - For the negotiated option, CAISO will identify how to determine negotiated opportunity costs, which will be tailored to each resource.
- Market Simulation of OCC in Aug-Sep, including integration of the OCC so that MPs can see adders flowing into SIBR and available in CMRI.
- Prior to November 1st, data will not be flowing downstream (publication explicitly blocked). During this period CAISO will interact with each MP depending on the specifics of their resources. This will be tracked via CIDI tickets.

Fall 2018 - Green House Gas Enhancements for EIM

Project Info	Details/Date
Application Software Changes	<p>The CAISO proposes to adjust its solution to address emissions associated with secondary dispatch. The CAISO will limit the GHG bid quantity of EIM participating resources to the MW value between the EIM participating resource's base schedule and the resource's upper economic limit (UEL).</p> <p>Since the GHG bid quantity is now limited, this will change the market dispatch to identify other EIM participating resources that have available capacity above their base schedule to support EIM transfers into CAISO to serve CAISO demand. The GHG emissions of these resources will now be appropriately reflected in the market attribution.</p> <p>The CAISO decided to withdraw the two-pass solution previously proposed.</p>
BPM Changes	Energy Imbalance Market (EIM)

Milestone Type	Milestone Name	Dates	Status
Board Approval	Present report to BOG	Jul 25, 2018	
External BRS	Post External BRS to CAISO website	May 30, 2018	✓
Tech Spec	Publish Technical Specifications	N/A	
Tariff	File Tariff	TBD	
Config Guides	Publish Configuration Guides	N/A	
BPMs	Publish Final Business Practice Manuals	TBD	
External Training	Deliver external training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	Green House Gas Enhancements for EIM	Nov 1, 2018	

Fall 2018 – Settlement Performance Improvements

Project Info	Details/Date
Application Software Changes	<p>The scope of the Settlements Performance Improvements include:</p> <ul style="list-style-type: none"> • Performance improvements for Post Bill Determinant Mapping process - Non-production storage issue causing delays to the statement publication • Performance improvements of Statement Generation (BD File Size issue): Daily Statements generation Monthly Statements and Invoice generation <p>Systems: Settlements</p>
BPM Changes	Settlements and Billing
Business Process Changes	Settlements & Billing: Application Flow should be reviewed for possible changes

Milestone Type	Milestone Name	Dates	Status
External BRS	Complete and Post External BRS	Feb 20, 2018	✓
OTHER	Settlement Interface Specification for Scheduling Coordinators	Mar 16, 2018	✓
Tariff	File Tariff	N/A	
Config Guides	Design review - BPM and Tariff SMEs	N/A	
BPMs	Post Draft BPM changes	N/A	
Tech Spec	Create ISO Interface Spec (Tech spec)	N/A	
External Training	Milestone: Training Complete	Aug 10, 2018	
Market Sim	Market Sim Window	Aug 20, 2018 - Sep 28, 2018	
Production Activation	Settlements Performance Improvements	Nov 01, 2018	

Fall 2018 – ESDER Phase 2

Project Info	Details/Date
Application Software Changes	<p>Settlements:</p> <ul style="list-style-type: none">Alternative Baselines:<ul style="list-style-type: none">Possible system changes to include addition of an automated monitoring tool for performance measurement data received from external participants.Changes to the DRRS registration system for the selection of the new baselines and allowing for ISO approval prior to use in the market.Settlement configuration will need to be evaluated and revised to assure PDRs that provide AS services can be calculated correctly based on the submitted SQMD. <p>ECIC:</p> <ul style="list-style-type: none">EIM Net Benefits Testing:<ul style="list-style-type: none">Code modification to calculation to accommodate addition of all applicable gas price indices. <p>MRI-S:</p> <ul style="list-style-type: none">Alternative Baselines:<ul style="list-style-type: none">The DRS Decommissioning project seeks to retire the current DRS system. Once this system is retired all current functionality will reside in the MRI-S (Market Results Interface – Settlements) system. It should be noted that all available customer load baseline calculations will be submitted into the MRI-S system once the DRS system is retired.
BPM Changes	<p>Market Instruments:</p> <ul style="list-style-type: none">EIM Net Benefits Testing:<ul style="list-style-type: none">Changes will include addition of all gas price indices used in calculation. <p>Metering:</p> <ul style="list-style-type: none">Alternative Baselines:<ul style="list-style-type: none">Need to revise the BPM to explain new baselines and changes to existing systems.Station Power:<ul style="list-style-type: none">Need to revise BPM to provide examples of wholesale/retail uses for generation and storageNeed to revise BPM to clarify permitted/prohibited netting rules. <p>Definitions & Acronyms:</p> <ul style="list-style-type: none">Station Power:<ul style="list-style-type: none">Revision of Station Power definition to match Tariff language. <p>Settlements & Billing:</p> <ul style="list-style-type: none">Alternative Baselines:<ul style="list-style-type: none">Possible changes to reflect settlements configuration changes.

Fall 2018 – ESDER Phase 2

Project Info	Details/Date
Business Process Changes	<ul style="list-style-type: none"> • Develop Infrastructure (DI) (80001) • Manage Market & Reliability Data & Modeling (MMR) (80004) • Manage Operations Support & Settlements (MOS) (80007) • Support Business Services (SBS) (80009) • Other

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Jul 26, 2017	✓
External BRS	Post External BRS	Oct 17, 2017	✓
	Post Revised External BRS	Mar 01, 2018	✓
Tariff	Post Draft Tariff	Nov 17, 2017	✓
	Post Updated Draft Tariff (based on feedback)	Apr 09, 2018	✓
	File Tariff with FERC	Aug 01, 2018	
CPG	Next CPG Meeting	Jun 01, 2018	✓
Config Guides	Settlements Config Guides	May 18, 2018	✓
BPMs	Post Draft BPM changes	Aug 06, 2018	
Tech Spec	Publish ISO Interface Spec (Tech spec)	May 21, 2018	✓
External Training	Deliver external training	Aug 07, 2018	
Market Sim	Market Sim Window	Aug 20, 2018 - Sep 28, 2018	
Production Activation	ESDER Phase 2	Nov 01, 2018	

Fall 2018 – Generator Contingency and Remedial Action Scheme Modeling

Project Info	Details/Date
Application Software Changes	<ul style="list-style-type: none"> • Enhance the Security Constrained Economic Dispatch <ul style="list-style-type: none"> • Model generation/load loss in the dispatch • Model transmission loss along and generation/load loss due to RAS operation dispatch • Model transmission reconfiguration due to RAS operation in the dispatch • Update the congestion component of LMP so that it considers the cost of positioning the system to account for generator contingencies and RAS operations • Enhance DAM, RTM and EIM to support generator contingencies Impacted systems: <ul style="list-style-type: none"> • CRR, EDR, EMMS, IFM/RTM, Integration, MF.
BPM Changes	<ul style="list-style-type: none"> • Managing Full Network Model • CRR • Market Operations • EIM
Business Process Changes	<ul style="list-style-type: none"> • Manage Congestion Revenue Rights (MMR LII) • Manage Operations Planning • Manage Real Time Operations - Transmission & Electric System (MMG LII)

Fall 2018 – Generator Contingency and Remedial Action Scheme Modeling

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Sep 19, 2017	✓
External BRS	Complete and Post External BRS	Mar 16, 2018	✓
Tariff	File Tariff	Jun 20, 2018	
Config Guides	Post Draft Config Guides	N/A	
External Training	Deliver external business training	Aug 10, 2018	
BPMs	Post Draft BPM changes	Aug 10, 2018	
Tech Spec	Create ISO Interface Spec (Tech spec)	N/A	
Market Sim	Market Sim Window	Aug 20, 2018 - Sep 28, 2018	
Production Activation	Generator Contingency and RAS Modeling	Nov 01, 2018	

Fall 2018 - CRR Auction Efficiency – 1A

Project Info	Details/Date	
Application Software Changes	<p>CRR Auction Efficiency 1A project is focused on:</p> <ol style="list-style-type: none"> 1. Creating an annual outage reporting deadline to be aligned with the annual congestion revenue rights allocation and auction process to improve the congestion revenue rights model used in the annual process. 2. Limiting the congestion revenue right source and sink combinations that market participants can purchase in the auctions to better align the congestion revenue rights product with the purpose of hedging congestion charges associated with supply delivery in the CAISO's locational marginal price-based day-ahead market. 3. Introducing a mechanism to allow market participants to sell previously acquired CRRs into subsequent auctions <p>System Impacts: CRR, OASIS.</p>	
BPM Changes	<ul style="list-style-type: none"> • CRR • Credit Management and Market Clearing • Market Instruments 	<ul style="list-style-type: none"> • Outage Management • Settlements & Billing
Business Process Changes	<ul style="list-style-type: none"> • Manage Market & Reliability Data & Modeling (MMR) - Manage Outage Data • Manage Markets & Grid (MMG) -Manage Congestion Revenue Rights & Prepare CRR Allocation Data 	

Fall 2018 - CRR Auction Efficiency – 1A

Milestone Type	Milestone Name	Dates	Status
Board Approval	BOG Presentation and Approval	Mar 22, 2018	✓
External BRS	Post External Draft BRS	May 11, 2018	✓
Tariff	File Tariff	Apr 09, 2018	✓
Config Guides	Post Draft Configuration Guides	TBD	
BPMs	Post BPM (Draft)	Aug 10, 2018	
Tech Spec	Create ISO Interface Spec (Tech spec)	N/A	
External Training	Deliver external training	Jul 31, 2018	
Market Sim	Market Sim Window	Aug 20, 2018 - Sep 28, 2018	
Production Activation	CRR Auction Efficiency 1A	Nov 01, 2018	

Fall 2018 – EIM Enhancements 2018

Project Info	Details/Date
Application Software Changes	<ul style="list-style-type: none"> • Markets to exclude Flex Ramp provision of EIM BAAs undergoing contingency • ISO Enhancement to BAAOP EIM operator screens to review active market data and Flex Ramp Sufficiency Test inputs <p>Systems:</p> <ul style="list-style-type: none"> • BAAOP – New display screens presenting currently active market data for market data submissions, flex ramp sufficiency test inputs • RTM Market Application <ul style="list-style-type: none"> • Exclude Flex Ramp Product provision for EIM BAAs undergoing contingency (FRU/FRD awards and prices set to zero); EIM Area footprint's FRP requirements are reduced by a diversity benefit pro rata amount based on excluded EIM BAAs • OASIS – new report displays real-time intervals where BAAs (ISO and EIM) are in contingency • Integration – OASIS API will support new report
BPM Changes	Energy Imbalance Market (EIM), Market Instruments, Market Operations
Business Process Changes	<ul style="list-style-type: none"> • Manage Entity & Resource Maintenance Updates • Manage Real Time Interchange Scheduling • Manage Real Time Operations- Maintain Balancing Area • Perform Price Validation, Manage Price Corrections

Fall 2018 – EIM Enhancements 2018

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board of Governors Approval	N/A	
External BRS	Post External BRS	Apr 30, 2018	✓
External BRS	Post Revised External BRS	Jun 01, 2018	✓
Tariff	File Tariff	N/A	
Config Guides	Post Config Guides	N/A	
BPMs	Post Draft BPM changes	Jul 09, 2018	
Tech Spec	Create ISO Interface Spec (Tech spec)	Jun 11, 2018	
External Training	Deliver external training	Aug 13, 2018	
Market Sim	Market Sim Window	Aug 20, 2018 - Sep 28, 2018	
Production Activation	EIM Enhancements 2018	Nov 01, 2018	

Fall 2018 – Extended STUC

Project Info	Details/Date
Application Software Changes	<p>BSAP/SIBR: Will facilitate provision of additional base schedules/bids to support a 20-hour extended horizon (additional 2 hours submission provides continuity in case STUC process failure occurs).</p> <p>STUC:</p> <ul style="list-style-type: none"> • Commitment horizon will extend from 4.5-hours to 18-hours (which will consider both daily demand peaks), allowing for additional opportunity of startup instruction for resources which have Start-Up Time + Minimum Up Time < 1080 minutes • STUC will not de-commit resources with RUC binding startups • If Day-Ahead results have not published, the STUC horizon will truncate to prevent it from extending beyond Day-Ahead results
BPM Changes	<ul style="list-style-type: none"> - Market Operations - Market Instruments - Energy Imbalance Market
Business Process Changes	Manage Markets & Grid

Fall 2018 – Extended STUC

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Jul 25, 2018	
External BRS	External BRS Posted	Jun 06, 2018	✓
Tariff	File Tariff	Aug 01, 2018	
Config Guides	Post Draft Config Guides	N/A	
BPMs	Post Draft BPM changes	Aug 10, 2018	
Tech Spec	Create ISO Interface Spec (Tech spec)	N/A	
External Training	External Training	Aug 13, 2018	
Market Sim	Market Sim Window	Aug 20, 2018 - Sep 28, 2018	
Production Activation	Extended STUC	Nov 01, 2018	

2019 Spring Release

Spring 2019 – EIM BANC/SMUD

Project Info	Details/Date
Application Software Changes	Implementation of SMUD as an EIM Entity
BPM Changes	EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from SMUD.
Market Simulation	December 3, 2018 – January 31, 2019
Parallel Operations	February 1, 2019 – March 30, 2019

config Guides	Milestone Name	Dates	Status
Tariff	File Readiness Certification	Mar 01, 2019	
Market Sim	Market Sim Window	Dec 03, 2018 - Jan 30, 2019	
Parallel Operations	Parallel Operations	Mar 30, 2019	
Production Activation	EIM - BANC-SMUD	Apr 03, 2019	

2019 Independent

2019 – ADS Replacement

Project Info	Details/Date
Application Software Changes	<ul style="list-style-type: none"> • Transition to web-based user interface to eliminate the need to install thick client • Transition ADS provisioning to the Access and Identity Management (AIM) application including Resource Level Access Controls (RACL) access • Move historical ADS data to CMRI adding query tool functionality to CMRI also • Move near-term transactions for FERC-764 15-minute awards to ADS; This will include user interface; historical transactions will stay in CMRI. • Various user interface enhancements adding content per Operation's request • ADS B2B services will not otherwise change.
BPM Changes	To Be Determined
Business Process Changes	To Be Determined

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Post External BRS	TBD	
Tariff	File Tariff	N/A	
Config Guides	Design review - BPM and Tariff SMEs	N/A	
Tech Spec	Publish Technical Specifications	TBD	
External Training	Conduct External Training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	ADS Replacement	TBD	

2019 Fall Release

Fall 2019 – Contingency Modeling Enhancements Transmissions

Project Info	Details/Date
Application Software Changes	<ul style="list-style-type: none"> • Positions available resources so that the ISO has sufficient capability to respond to contingency events and return facilities to normal ratings within the emergency rating time frame • Enhances the LMP formulation to provide market price signal related to this reliability constraint • Creates a Locational Marginal Capacity Price (LMCP) which reflects: <ul style="list-style-type: none"> • A resource’s opportunity costs • Marginal congestion cost savings, and/or • The marginal capacity value to follow dispatch <p>Systems:</p> <ul style="list-style-type: none"> • ADS - Modified to display corrective capacity awards similar to AS • CMRI - New or modified reports to display LMCP prices and awards • IFM/RTM - Model new capacity awards and Locational Marginal Capacity Price (LMCP). • Integration • OASIS - New or modified reports to display LMCP prices and awards • PCA • Settlements
BPM Changes	Market Operations, Market Instruments, Definitions and Acronyms, Settlements and Billing
Business Process Changes	<ul style="list-style-type: none"> • Manage Operations Planning • Manage Day-Ahead Market • Manage Operations Engineering Support • Manage Real Time Operations - Transmission & Electric System • Manage Market Billings & Settlements

Fall 2019 – Contingency Modeling Enhancements - Transmissions

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval (BOG - 12/04/17)	Dec 14, 2017	✓
External BRS	Complete and Post External BRS	TBD	
Tariff	File Tariff	TBD	
Config Guides	Post Configuration Guide(s) (Draft)	TBD	
External Training	Deliver external training	TBD	
BPMs	Post BPM (Draft)	TBD	
Tech Spec	Create ISO Interface Spec (Tech spec)	TBD	
Market Sim	Market Sim Window	Jul 17, 2019 - Aug 30, 2019	
Production Activation	Contingency Modeling Enhancements -Transmission	Oct 01, 2019	

Fall 2019 – Commitment Cost and Default Energy Bid Enhancements

Project Info	Details/Date
Application Software Changes	<p>Scope: Enhances the ability to submit market-based commitment cost bids in order to reflect unique costs and volatility:</p> <ul style="list-style-type: none"> • Support integration of renewable resources through incentivizing flexible resources participation during tight fuel supply • Account for costs of flexible resources (gas and non-gas) to reduce risk of insufficient cost recovery • Encourage participation of non-RA and voluntary EIM resources; compliance with FERC Order 831 • Raises energy bid cap from \$1,000/MWh to \$2,000/MWh: • Requires supporting verified costs of energy bids above \$1,000/MWh • Introduces market power mitigation (MPM) measures for commitment costs. <p>Impacted Systems:</p> <ul style="list-style-type: none"> • SIBR: Incorporate negotiated default commitment bids, allow the submittal of Ex Ante cost adjustments. Increase commitment cost caps, increase energy bid caps, incorporate soft energy bid cap. Allow for hourly submittal of minimum load bids into day-ahead market. • IFM/RTM: Add MPM tests for commitment costs. Mitigate commitment costs where tests indicate market power. Incorporate MPM (both energy and commitment) in short term unit commitment process. Recalibrate the penalty price parameters in response to raising energy bid cap to \$2,000/MWh. • CMRI: Provide resource-specific reporting on mitigation results for commitment costs. Provide additional source information for default bids. • MQS/PCA: Incorporate mitigation of commitment costs for specific exceptional dispatch (ED) types. Incorporate bid locking of commitment costs for ED instructions and for certain cases where resources are uneconomic to operating. • Master File: Allow submittal of resource-specific minimum load costs for costs that are independent of the Pmin level. Add the ability to indicate preference for new negotiated cost basis type. Provide a view of resource-specific scalars used for validating Ex-Ante cost adjustments. • CIDI: Incorporate templates for submitting request for manual consultation and ex-post default bid adjustments.

Fall 2019 – Commitment Cost and Default Energy Bid Enhancements

Project Info	Details/Date
BPM Changes	<ul style="list-style-type: none"> Market Instruments Market Operations
Business Process Changes	<ul style="list-style-type: none"> Maintain Major Maintenance Adders (MMG LIII) Maintain Negotiated Default Energy Bids (MMG LIII) Maintain Negotiated O_Ms (MMG LIII) Manage Day Ahead Market (MMG LII) Manage Market Billing Settlements (MOS LII) Manage Real Time Hourly Market (RTPD) (MMG LII) Manage Real Time Operations – Maintain Balance Area (MMG LII)

Milestone Type	Milestone Name	Dates	Status
Draft Policy	Publish Draft Business Rules externally	Jan 31, 2018	✓
Board Approval	Obtain Board of Governors Approval	Mar 22, 2018	✓
External BRS	Complete and Post External BRS	Apr 27, 2018	✓
Tech Spec	Publish Technical Specifications	TBD	
Tariff	File Tariff	TBD	
Config Guides	Post Draft Config Guides	TBD	
BPMs	Post Draft BPM changes	TBD	
External Training	Deliver external training	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	CCDEBE	Oct 01, 2019	

Fall 2019 – Day Ahead Market Enhancements

Project Info	Details/Date
Application Software Changes	<p>These are preliminary impact assessments</p> <p>DAM Enhancements include change the day-ahead market from hourly to 15 minute granularity, combine IFM and RUC, procure imbalance reserves</p> <ul style="list-style-type: none"> • Calculate Imbalance Reserve (IR) Requirements in 15 minute interval (DAM) • EIM interface to submit Base schedule in 15 minute interval (BSAP) • EIM balance test, capacity test and sufficient test in 15 minute interval (RTM) • Report DAM market results in 15 minute Interval (CMRI) • MP can bid IRU and IRD price in SIBR • DAM co-optimize Energy, AS and IR in 15 minute intervals (DAM) • Remove RUC • Get as self-scheduled 15 minute DAM award of energy in RTM if no real time bids (RTM) • Calculate Settlement DAM Expected Energy in 15 minute interval (RTM) • Calculate Bid cost recovery (MQS) • Settle DAM based on 5 minute interval schedules (Settlement) • Settle CRR in DAM 15 minute intervals (Settlement) • Publish DAM energy and AS requirements and prices in 15 minute interval in OASIS
BPM Changes	Market Instruments, Market Operations, Settlements & Billing, Energy Imbalance markets
Business Process Changes	<ul style="list-style-type: none"> • Manage Day Ahead Market • Manage D+X analysis • Manage Real Time Operations- Maintain Balancing Area • Manage Market Billings & Settlements

Fall 2019 – Day Ahead Market Enhancements

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Sep 06, 2018	
External BRS	External BRS	TBD	
Tariff	File Tariff	TBD	
Config Guides	Design review - BPM and Tariff SMEs	TBD	
BPMs	Post Draft BPM changes	TBD	
Tech Spec	Create ISO Interface Spec (Tech spec)	TBD	
Market Sim	Market Sim Window	TBD	
Production Activation	DAM Enhancements	Oct 01, 2019	

Stay Informed

Ways to participate in releases

- Visit the Release Planning page
 - <http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx>
- Attend meetings
 - Release Users Group (RUG) bi-weekly meetings
 - Initiative status updates
 - System change updates on independent releases
 - Market Simulation calls
 - Visit the ISO calendar at www.caiso.com for meeting dates and times and add events to your calendar
 - Typically held on Mondays and Thursdays
 - Market sim calls for major releases will be market noticed
 - Market Performance and Planning Forum
 - Bi-monthly review of market performance issues
 - High level discussion of release planning, implementation and new market enhancements

What to look for on the calendar...

Calendar of Meetings, Training and Events

Month: February Year: 2018 Calendar View List View Print View

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	5 WebbCONF: Market Simulation 2:00pm - 3:00pm	6 Training: Get to Know the ISO - Day 1 9:00am - 4:00pm WebbCONF: Imbalance Conformance Enhancements 10:00am - 12:00pm WebbCONF: Technical User Group 10:00am - 11:00am	7 Deadline: Comments - Interconnection Process Enhancements 2018 - Issue Paper and Meeting Discussion Training: Get to Know the ISO - Day 2 9:00am - 4:00pm Meeting: Flexible Resource Adequacy Criteria Must Offer Obligation Phase 2 - Revised Draft Flexible Capacity Framework 10:00am - 4:00pm WebbCONF: Market Settlement User Group 10:00am - 11:00am	8 Meeting: Audit Committee Teleconference (Executive) 8:30am - 9:30am Training: Settlements 101 9:00am - 4:00pm Meeting: 2017-2018 Transmission Planning Process 10:00am - 4:00pm WebbCONF: Market Simulation 2:00pm - 3:00pm	9 Training: Settlements 201 9:00am - 4:00pm	10
11 WebbCONF: Participating Transmission Owner Per Unit Cost Guides 10:30am - 12:00pm WebbCONF: Market Simulation 2:00pm - 3:00pm	12 Meeting: Congestion Revenue Rights Auction Efficiency 10:00am - 4:00pm WebbCONF: Release User Group 10:00am - 11:00am Call: Energy Imbalance Market Governing Body Teleconference (Executive) 11:30am - 12:30pm	13 Deadline: Submissions - April 2018 Monthly Resource Adequacy and Supply Plans Call: Congestion Revenue Rights 11:00am - 11:30am WebbCONF: Outage Management System Customer Partnership Group 2:00pm - 3:00pm	14 Deadline: Comments - Review Transmission Access Charge Structure Straw Proposal and Meeting Discussion Call: Board of Governors Teleconference (General) 8:15am - 9:00am Call: Board of Governors Teleconference (Executive) 9:00am - 10:00am Call: Market Update 10:15am - 11:00am WebbCONF: Market Simulation	15	16	17

Market Sim



Market Sim



Release Users Group (RUG)



Market Performance and Planning Forum

2018 Schedule

- August 29
- October 24
- December 19

Questions or meeting topic suggestions:

Submit through CIDI - select the “*Market Performance and Planning Forum*” category or email suggestions to kosborne@caiso.com.