



California ISO

Market Performance and Planning Forum

September 5, 2019

ISO PUBLIC

Objective: Enable dialogue on implementation planning and market performance issues

- Review key market performance topics
- Share updates to 2019 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 – September 5, 2019

9 a.m. – 12 p.m.

Time:	Topic:	Presenter:
9:00 – 9:05	Introduction, Agenda	Kristina Osborne
9:05 - 10:50	Market Performance and Quality Update	Market Analysis and Forecasting
10:50 – 11:20	Policy Update	John Goodin Don Tretheway
11:20 – 12:00	Release Update	Adrian Chiosea

Market Update

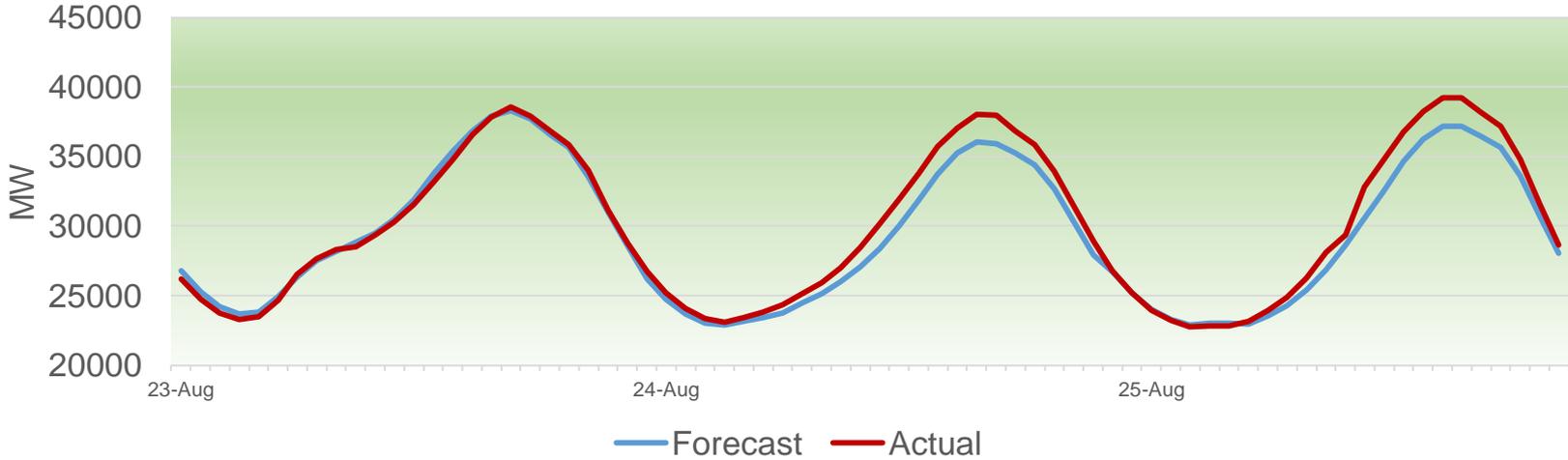
Market Analysis and Forecasting Department

Day Ahead Forecast 8/18/2018

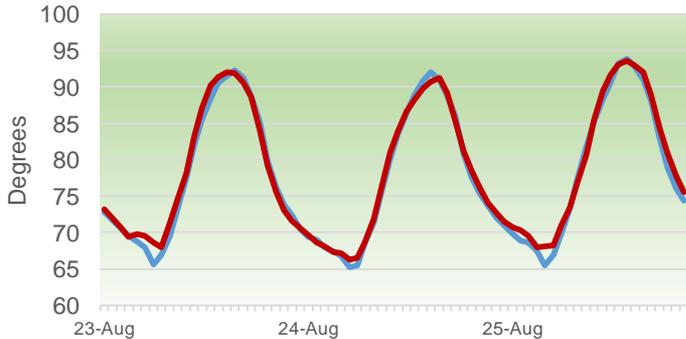
- Day ahead forecast for one region did not make it to the market
- Short term forecasting submitted a forecast through the regular process
- Model was not automatically providing a forecast
- The submitted forecast did not make it into the payload
- Safe guards are being set up to mitigate this issue on both the forecasting end and down stream

Forecast Error 8/23 – 8/25

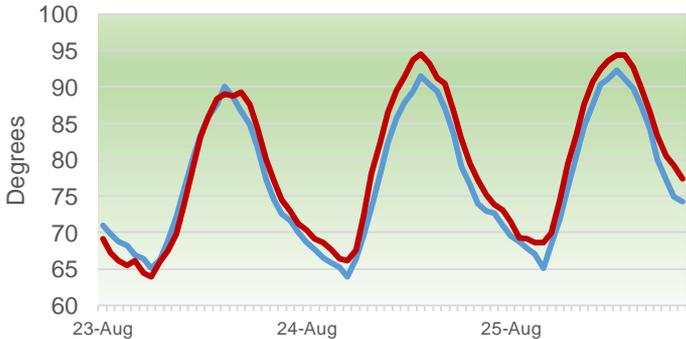
DA Load Forecast Error (System TAC)



NorCal Temperature Forecast Error (weighted average)

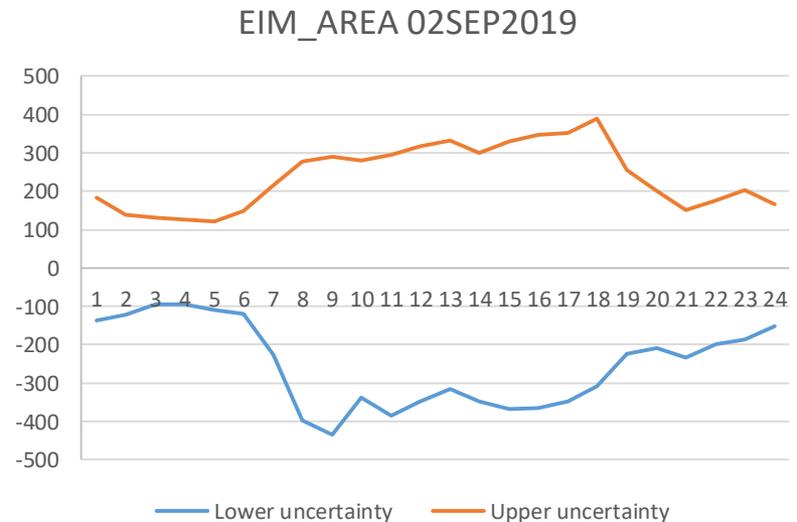
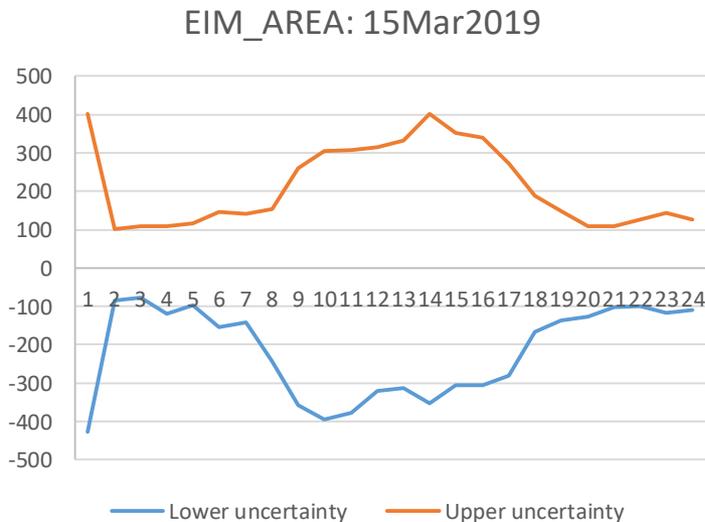


SoCal Temperature Forecast Error (weighted average)



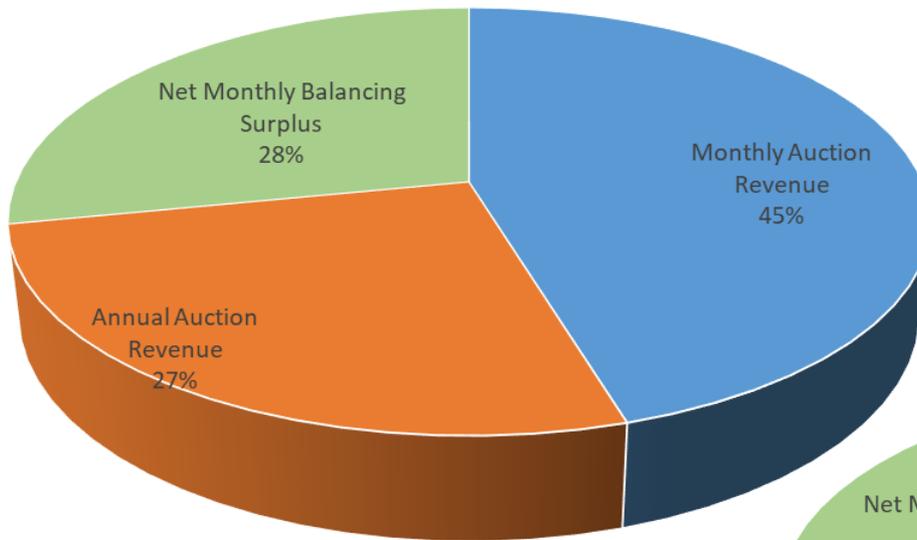
FRP Data Error in HE1 from December 2018-Apr 2019

- BAA-specific uncertainty requirements were systematically high for HE 1 in December 2018 – Apr 2018
- ISO discovered that EIM VER forecasts were dropping out for the HE 1 RTD interval 3 (00:10) run
- Root cause was missing EIM VER forecasts due to a timing mismatch on the payload.
- The mismatch was corrected 4/24/19.

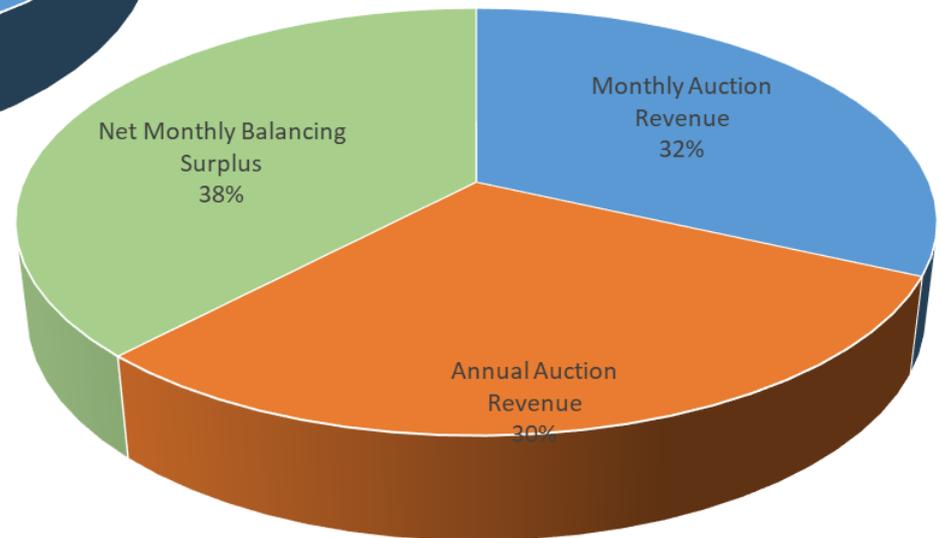


Total CRR payment after pro-rata adjustments

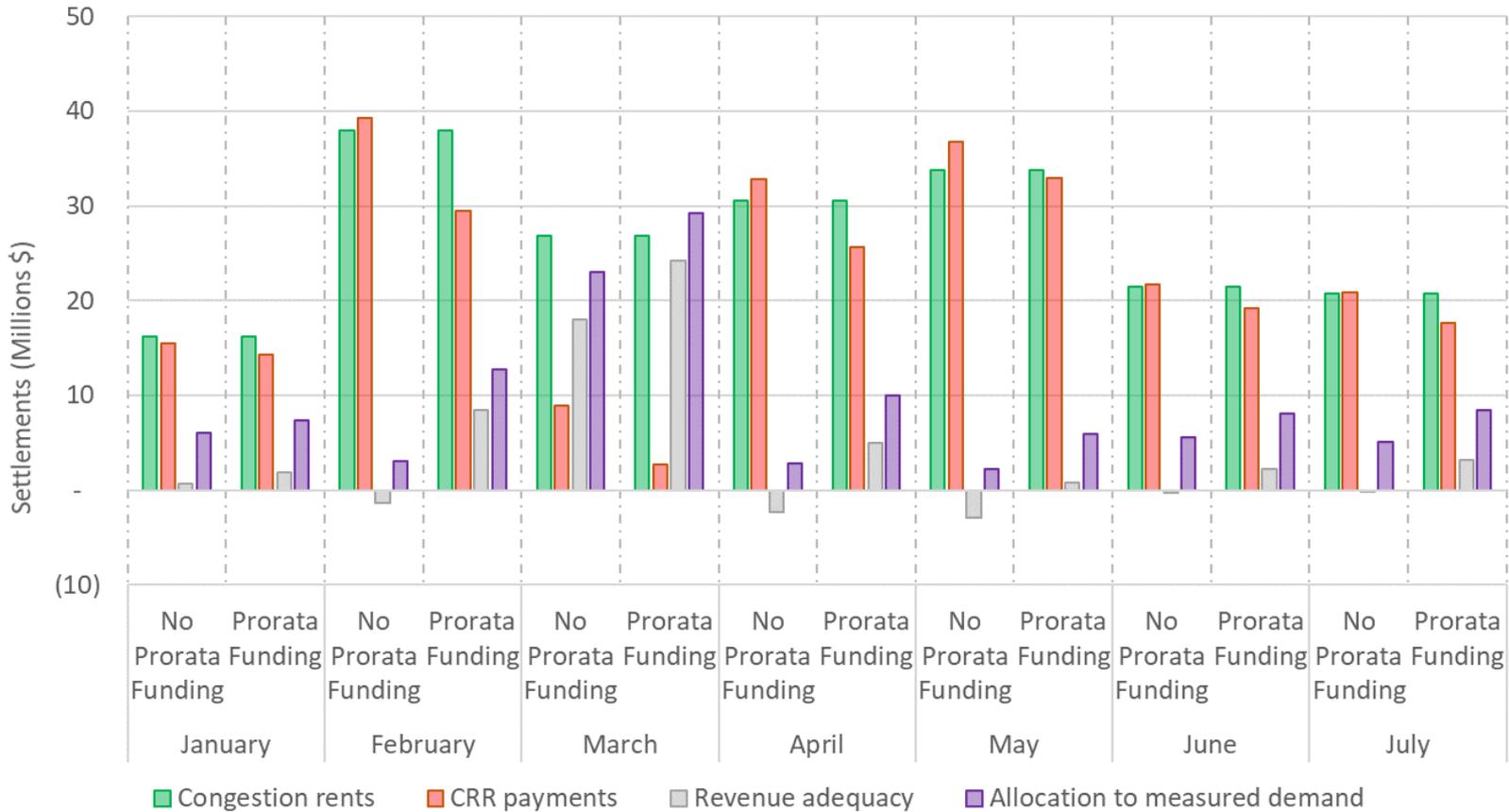
June - Total Balancing Account (~8million)



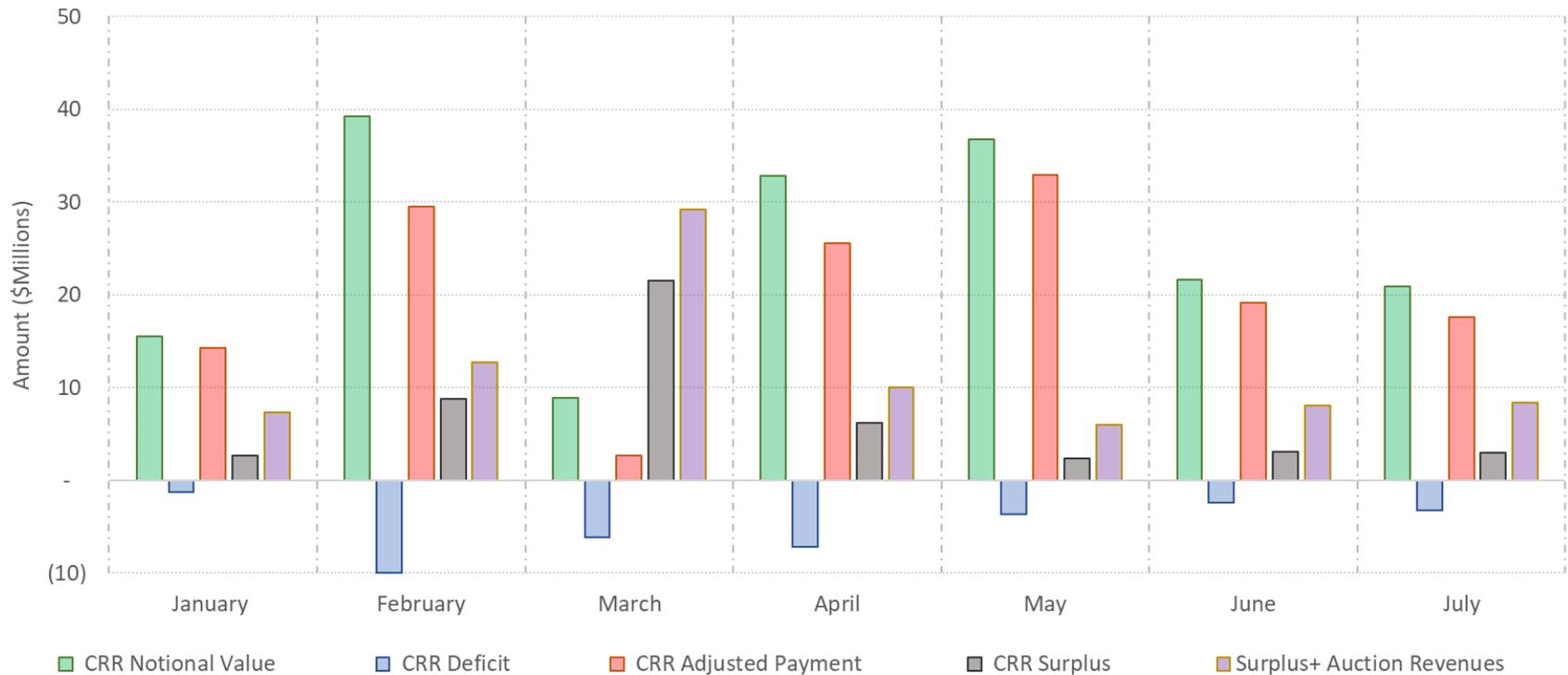
July - Total Balancing Account (~8million)



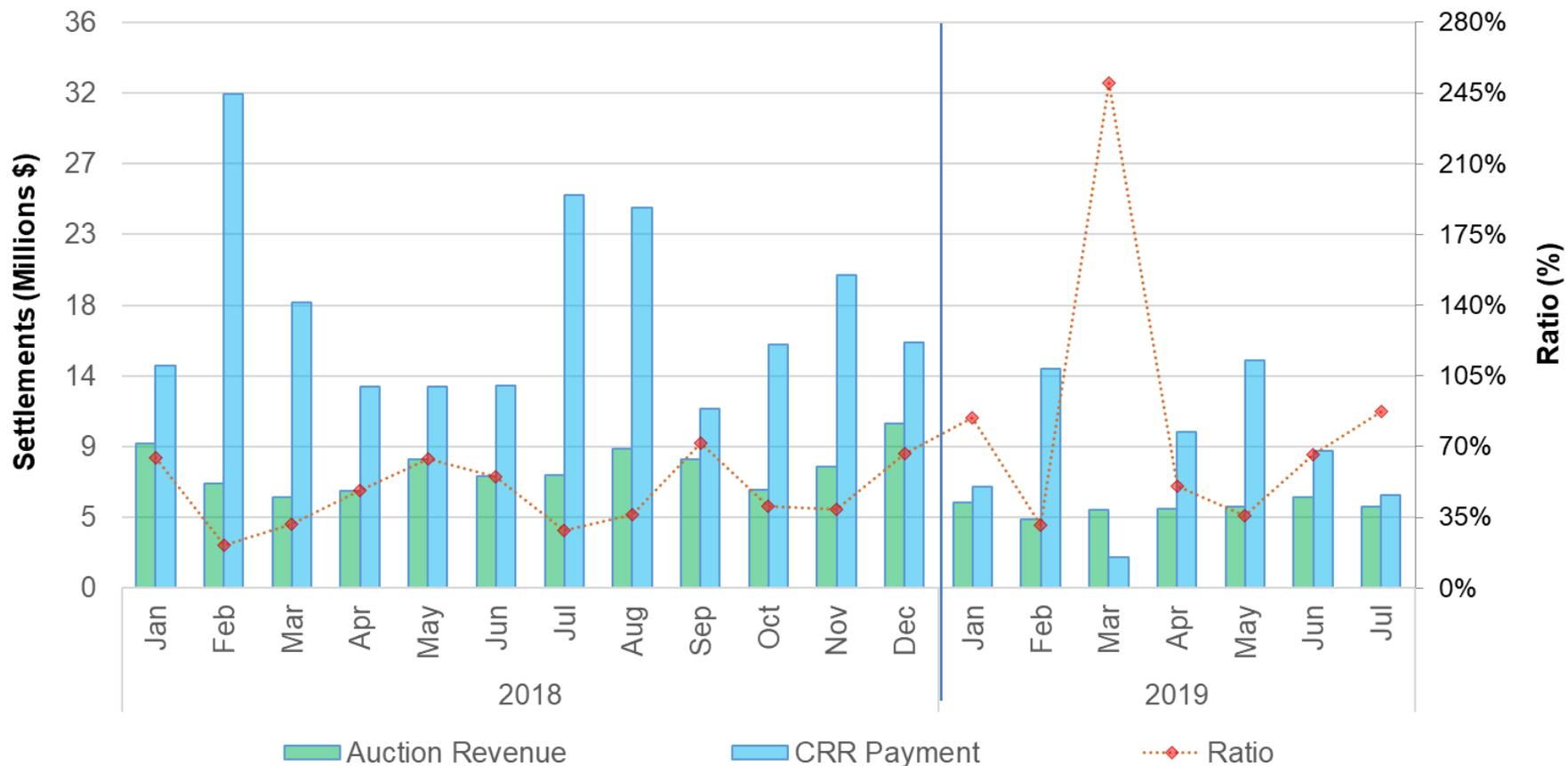
Total CRR surplus includes both auction revenues and balancing surpluses, and all of that is allocated to measured demand



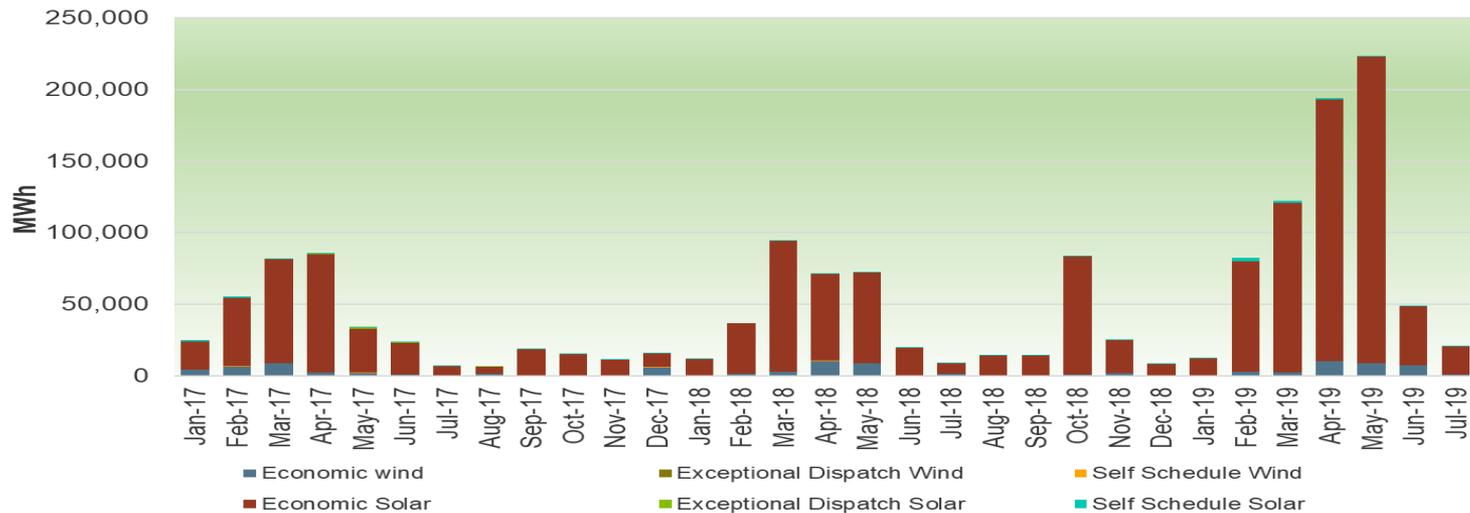
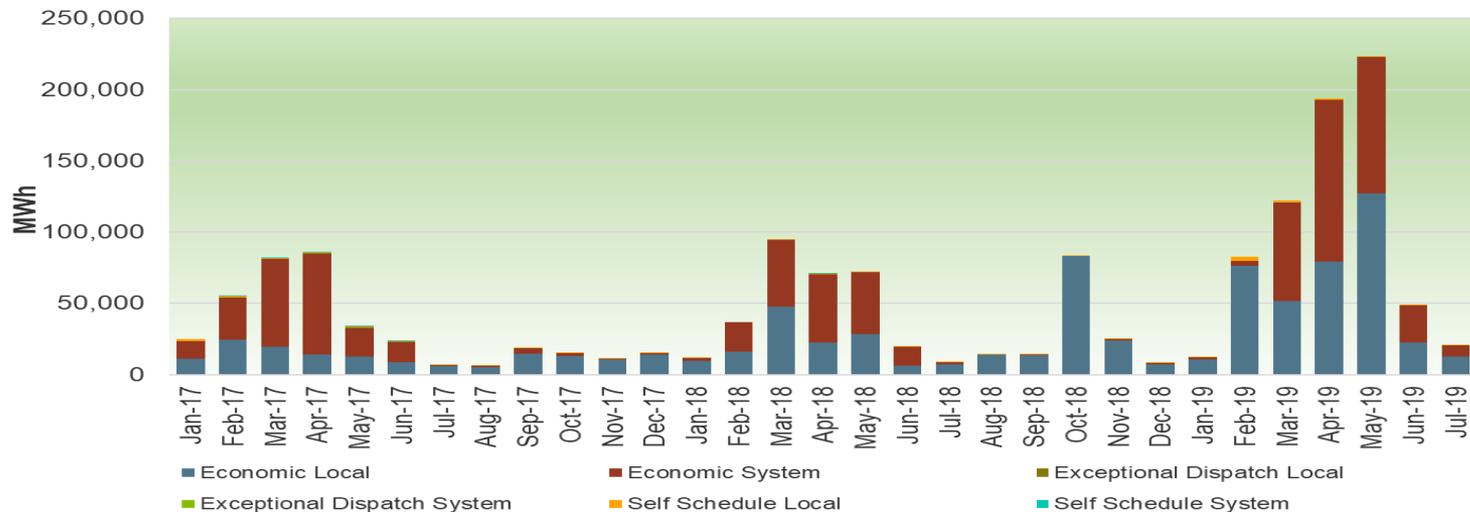
Steady surplus was observed in the last three months of 2019



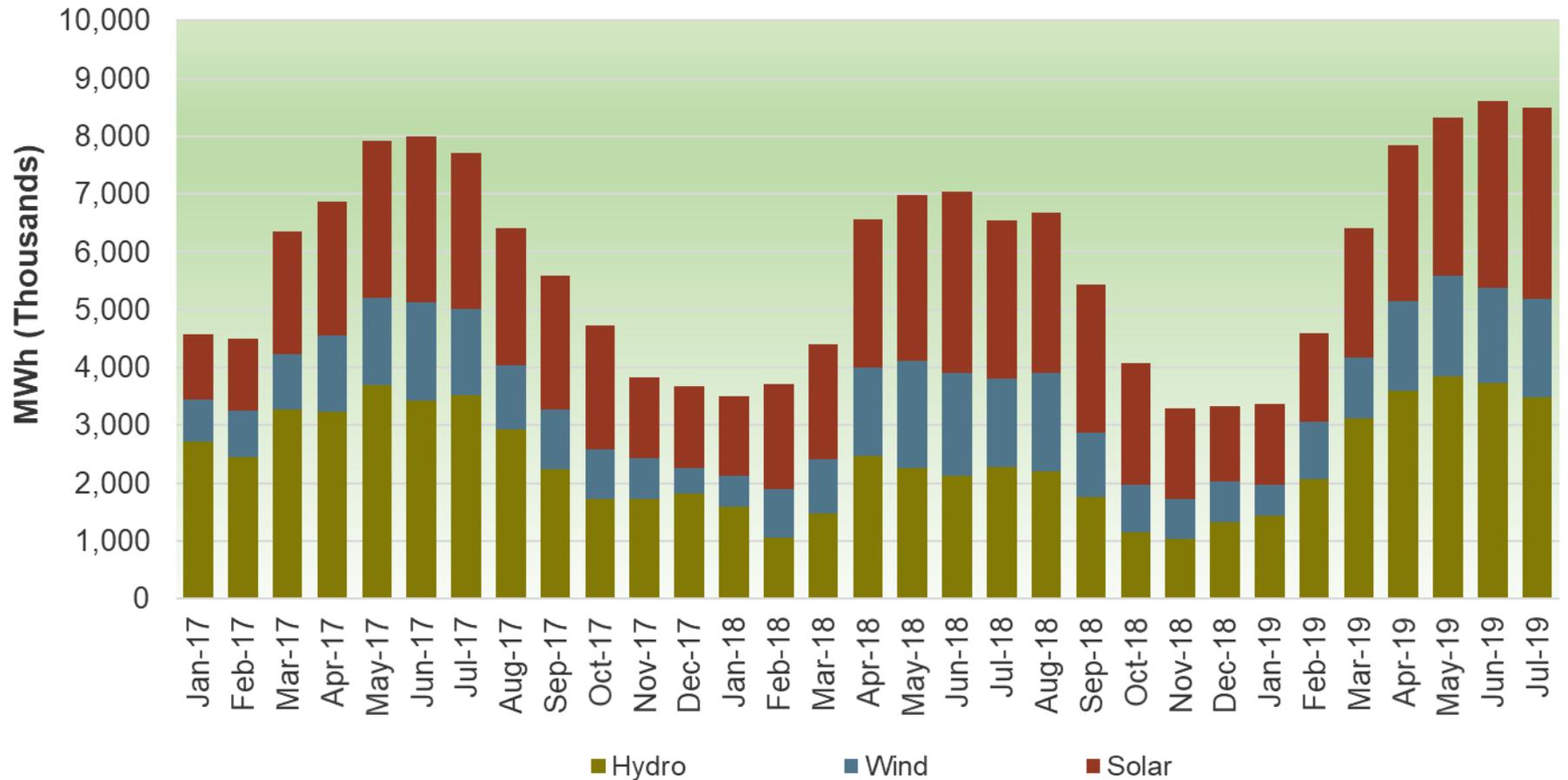
Auction revenue shortfall after CRR1B Policy is showing a reduction of shortfall in magnitude



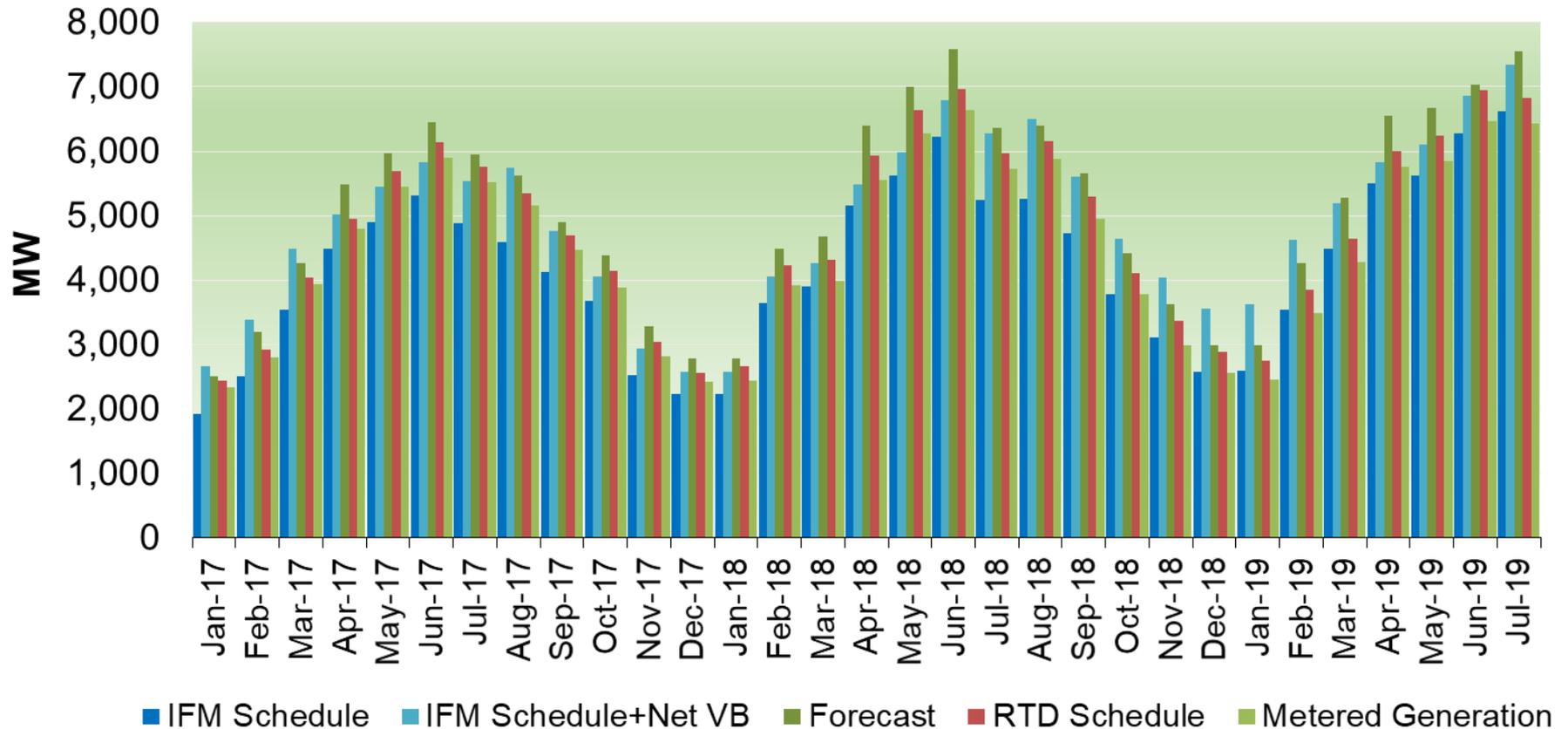
RTD renewable (VERs) curtailment fell since May



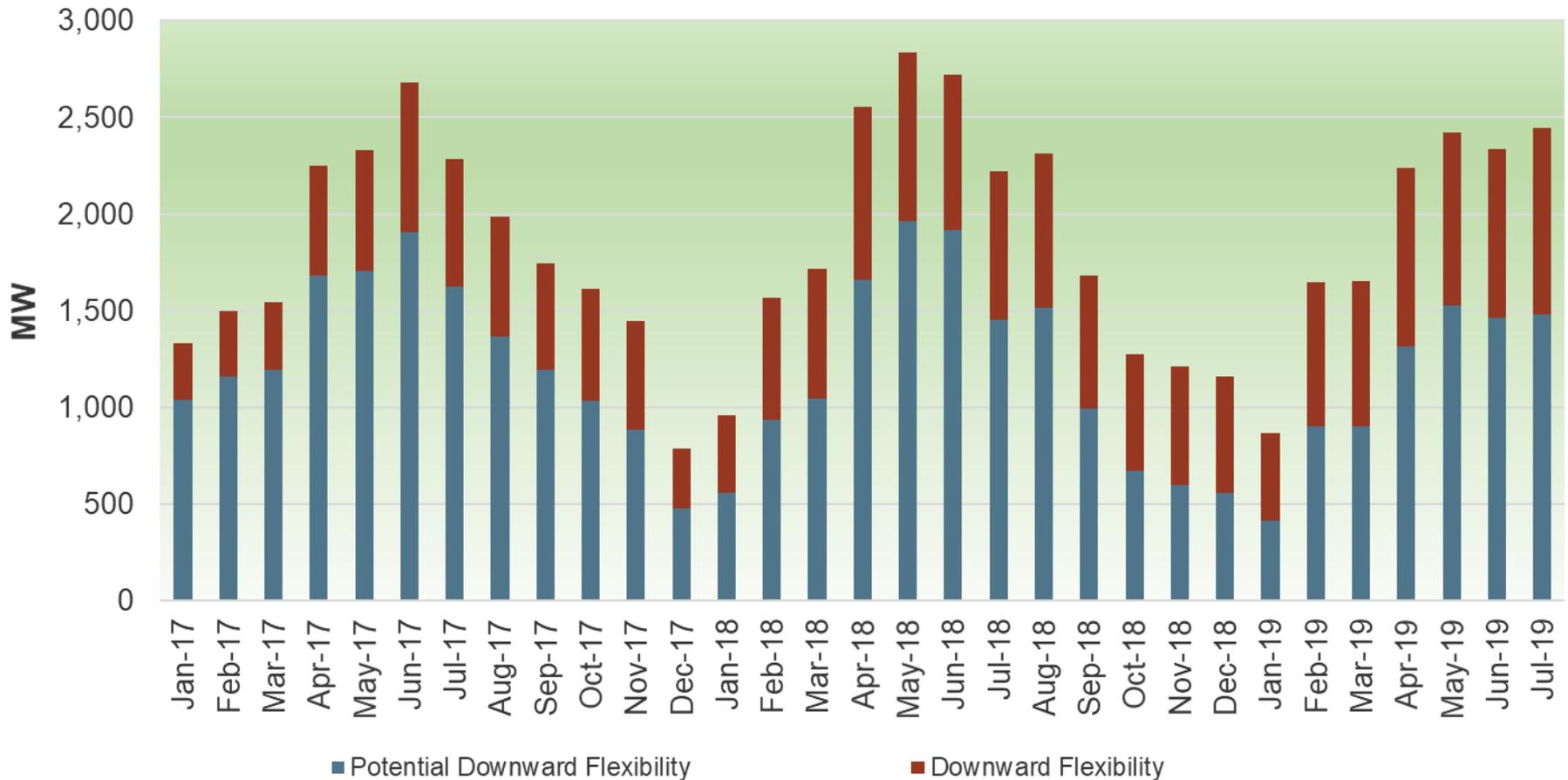
Hydro production higher than previous year in June and July



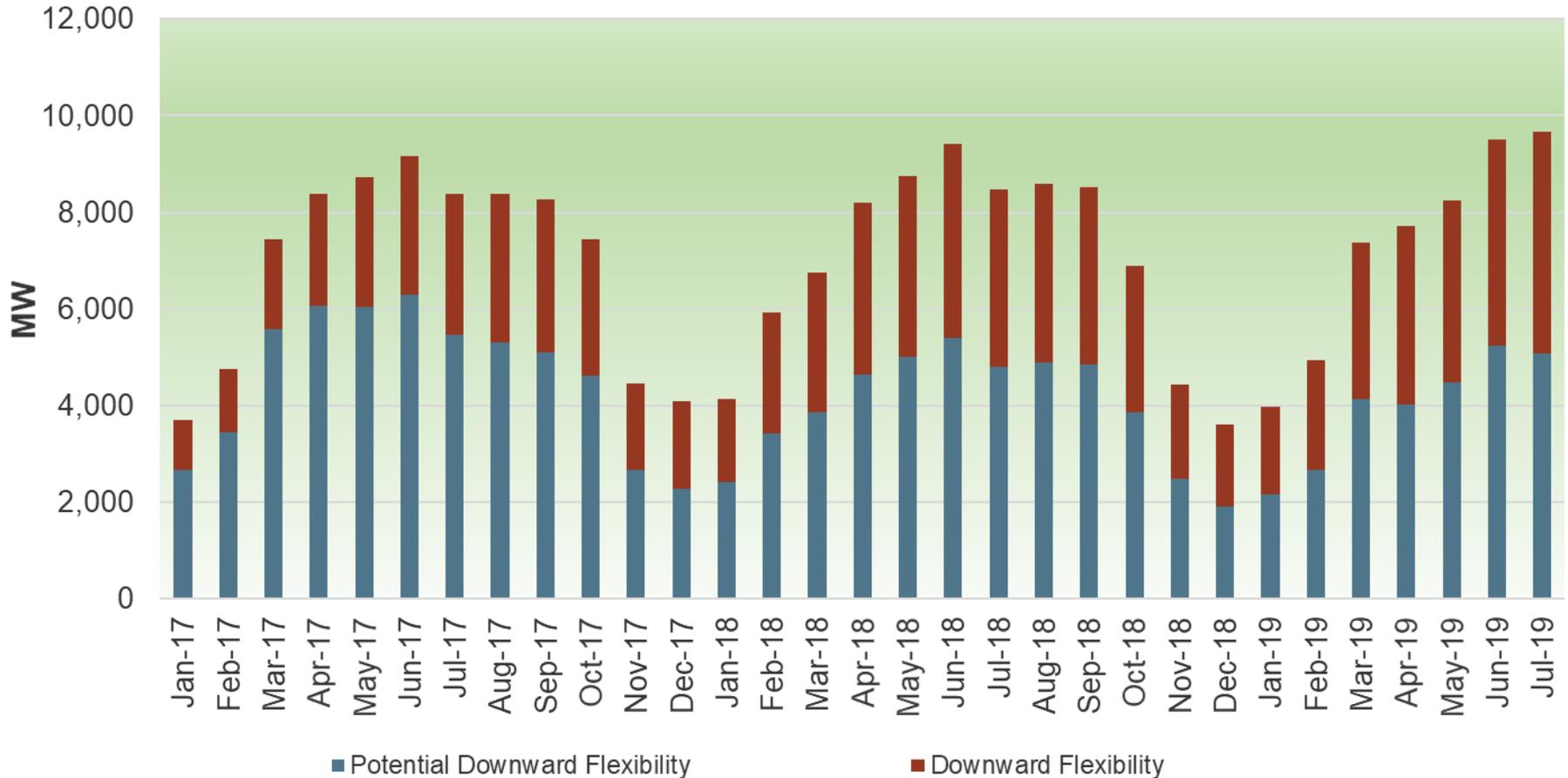
ISO total monthly VERS schedules and forecasts compared to actuals



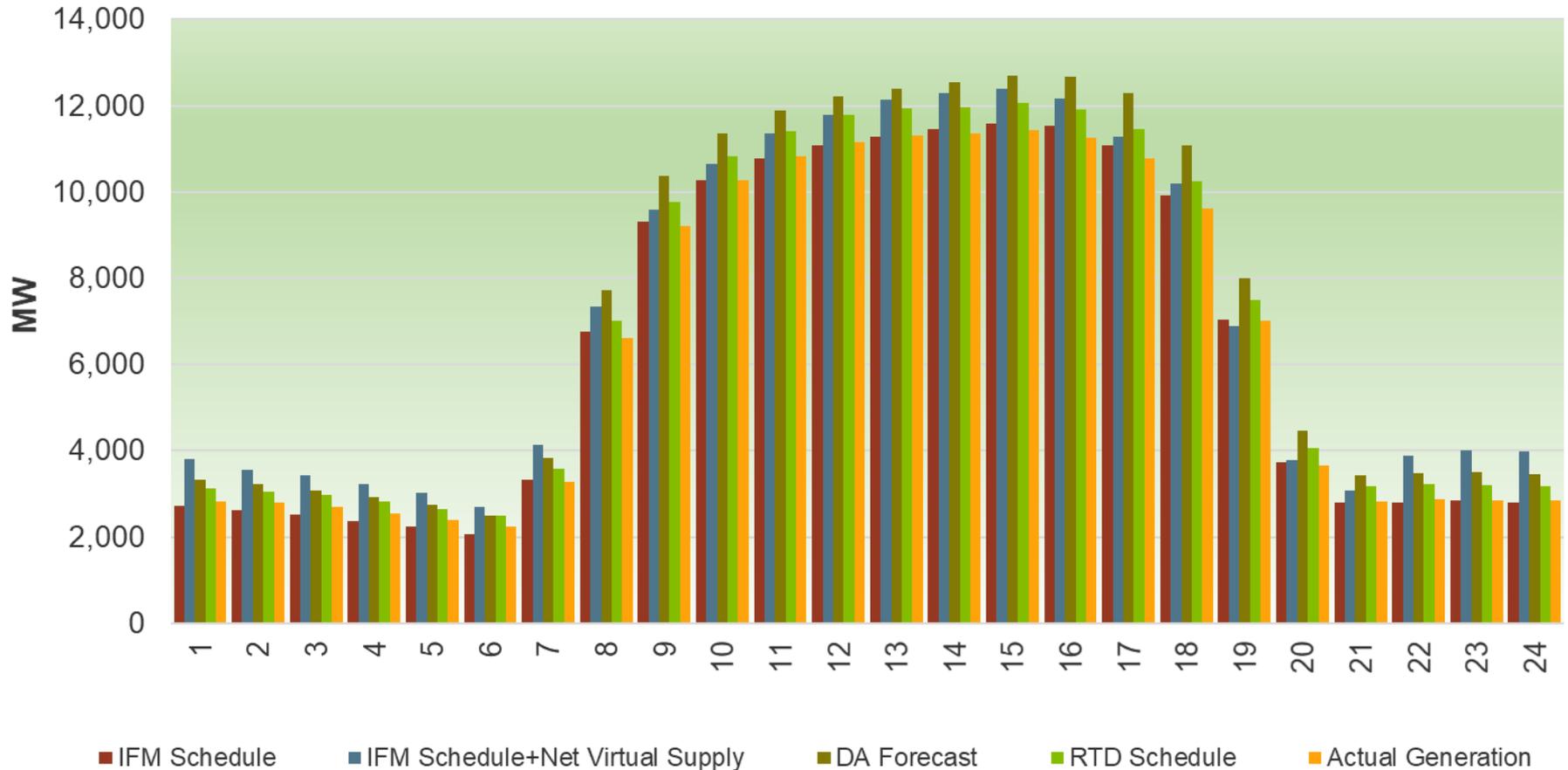
Monthly wind (VERS) downward flexibility in FMM



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

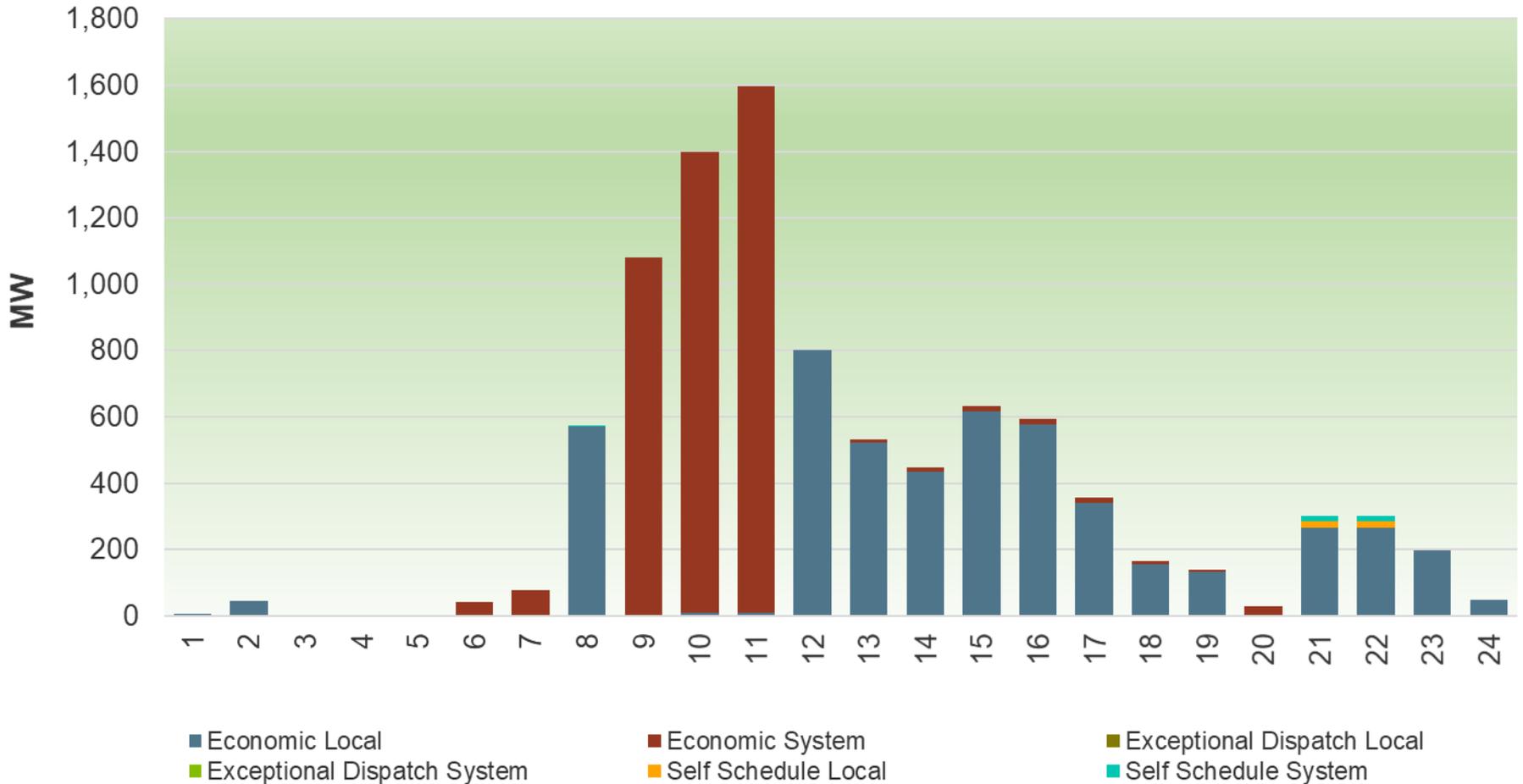


Renewable (VERS) schedules including net virtual supply aligns with VER forecast in June and July

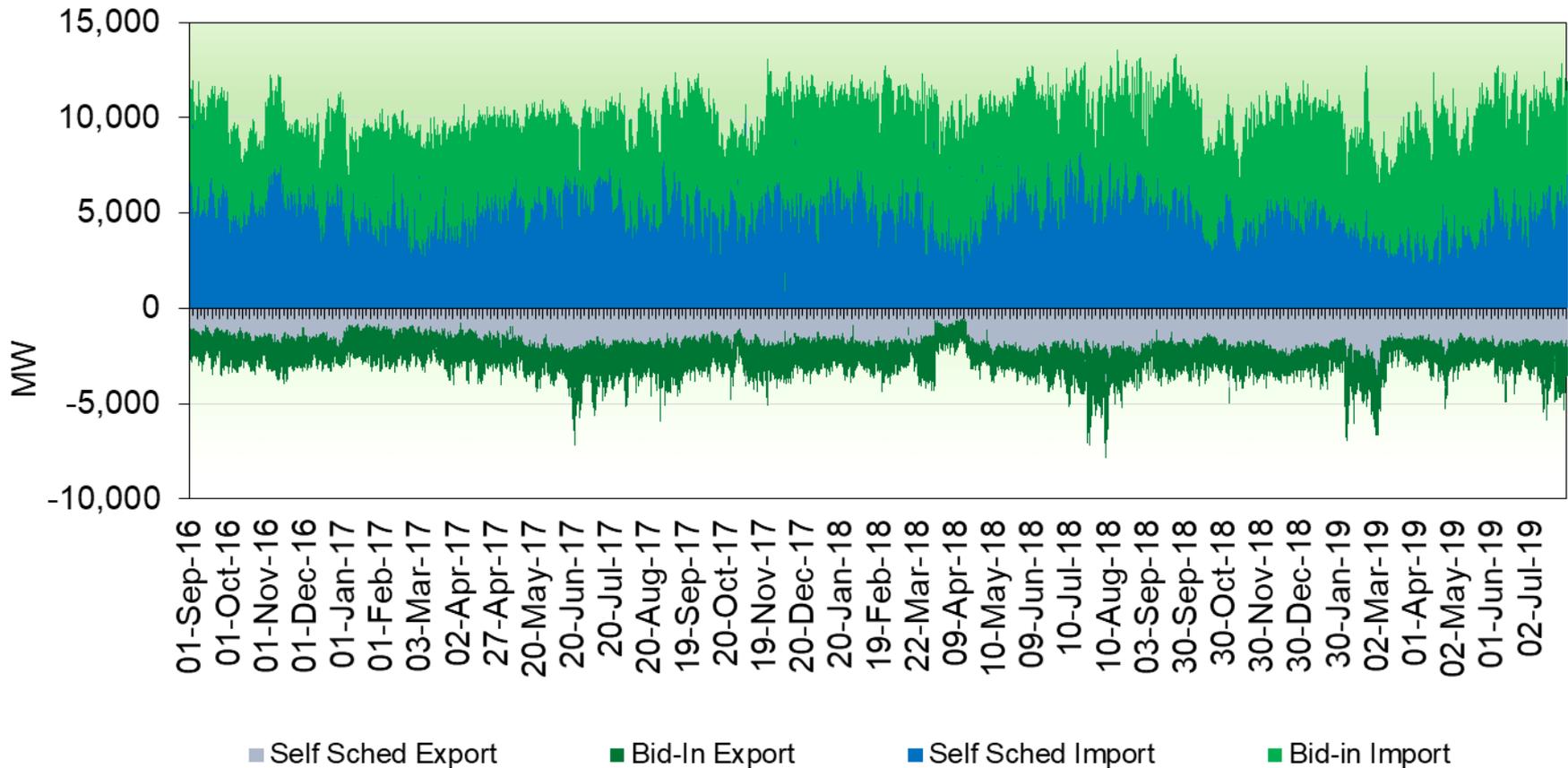


<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=EFF75C2E-F28E-4087-B88B-8DFFAED828F8>

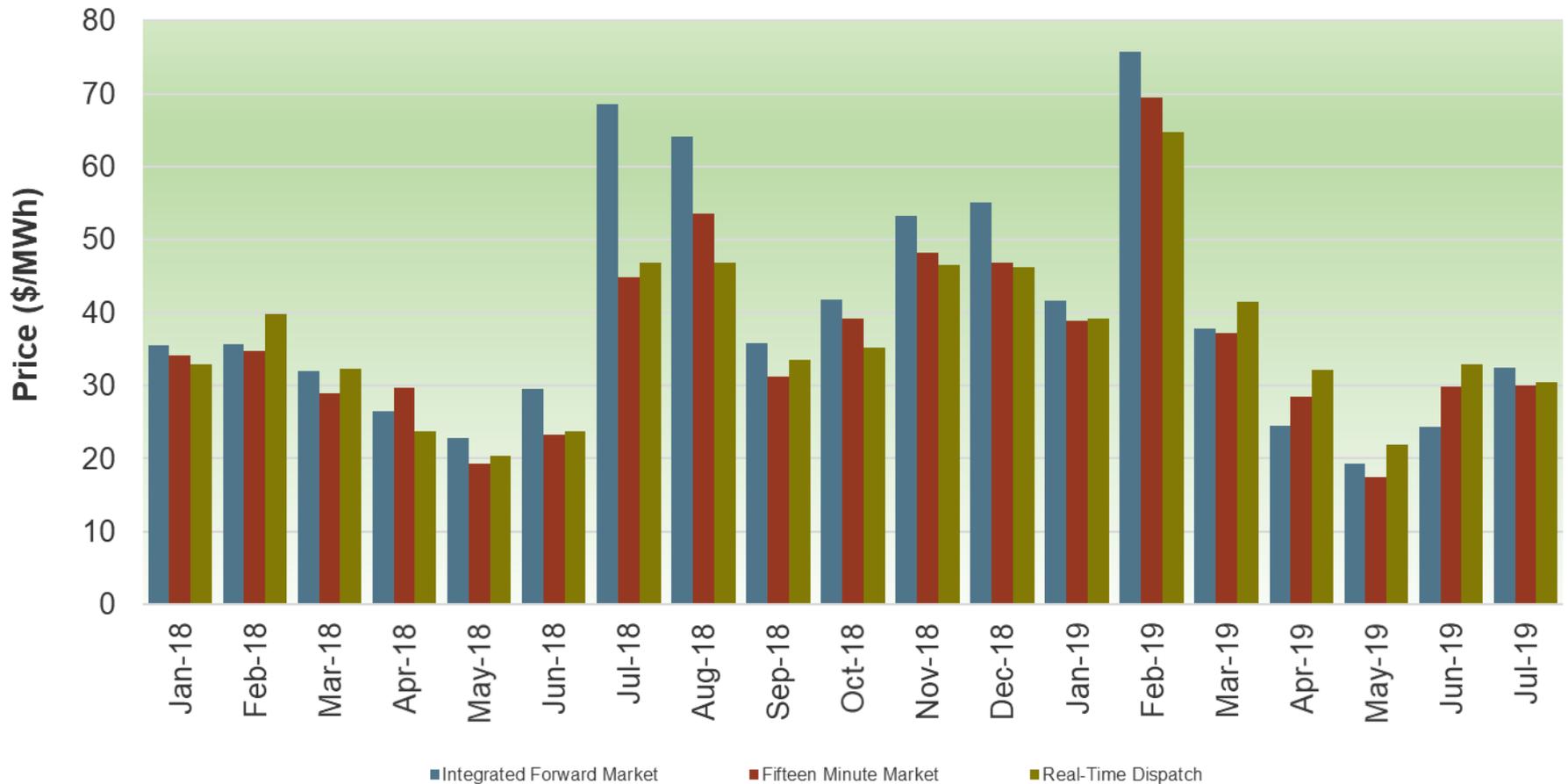
Hourly distribution of maximum RTD renewable (VERS) curtailment in July



Self scheduled interties in the real-time market remained at high levels

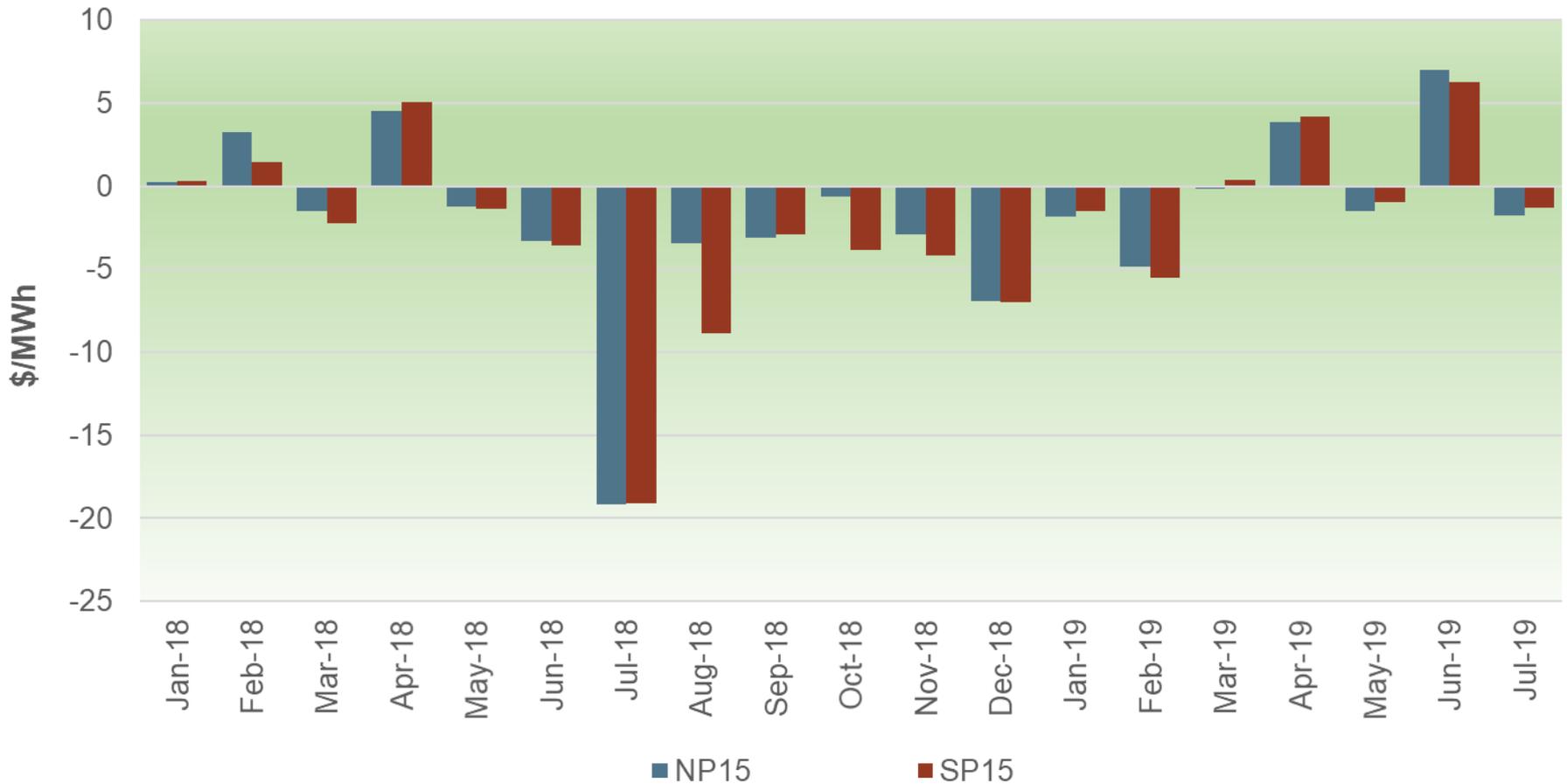


Improved price convergence in July

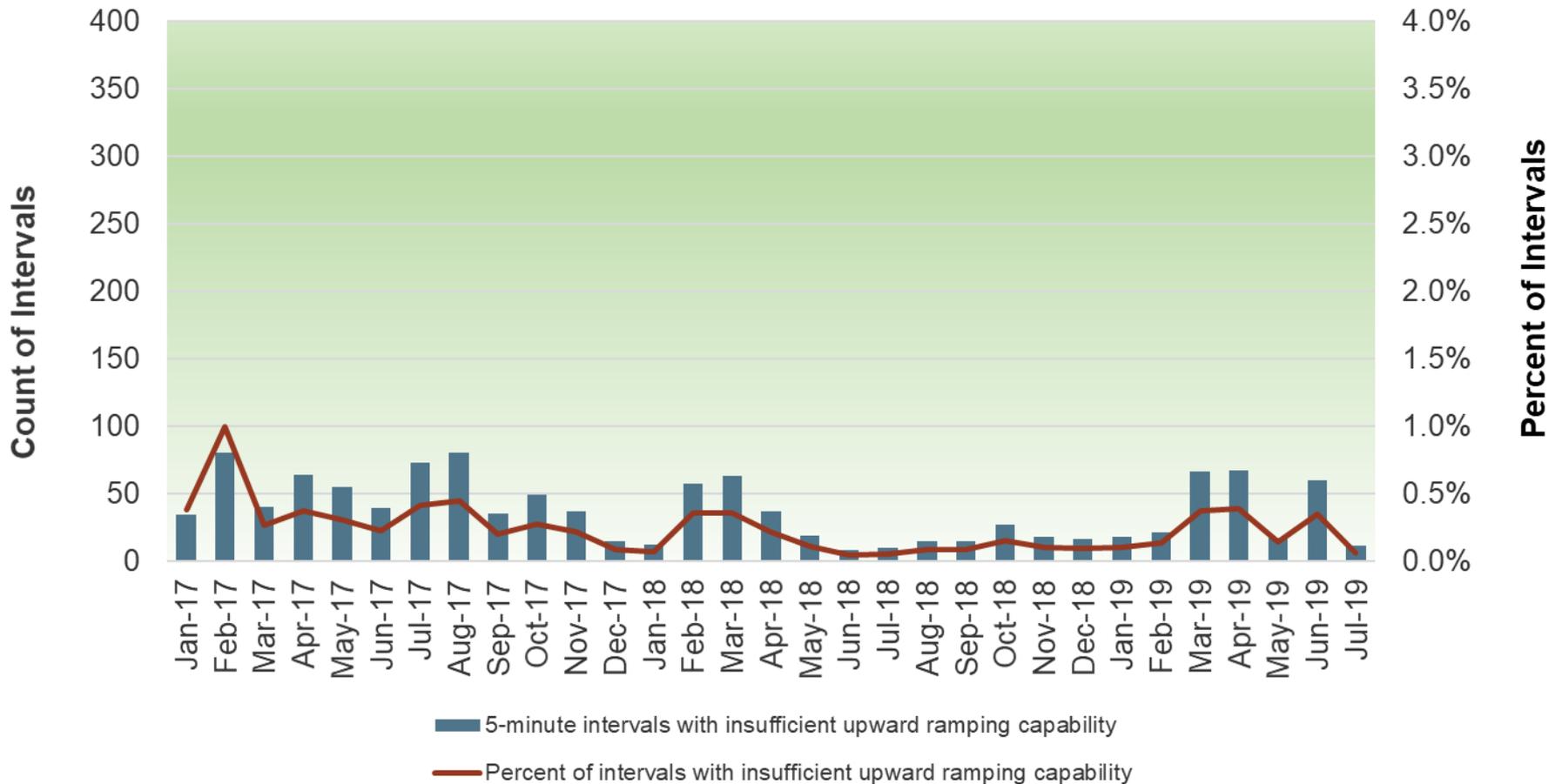


Note: Metric Based on System Marginal Energy Component (SMEC)

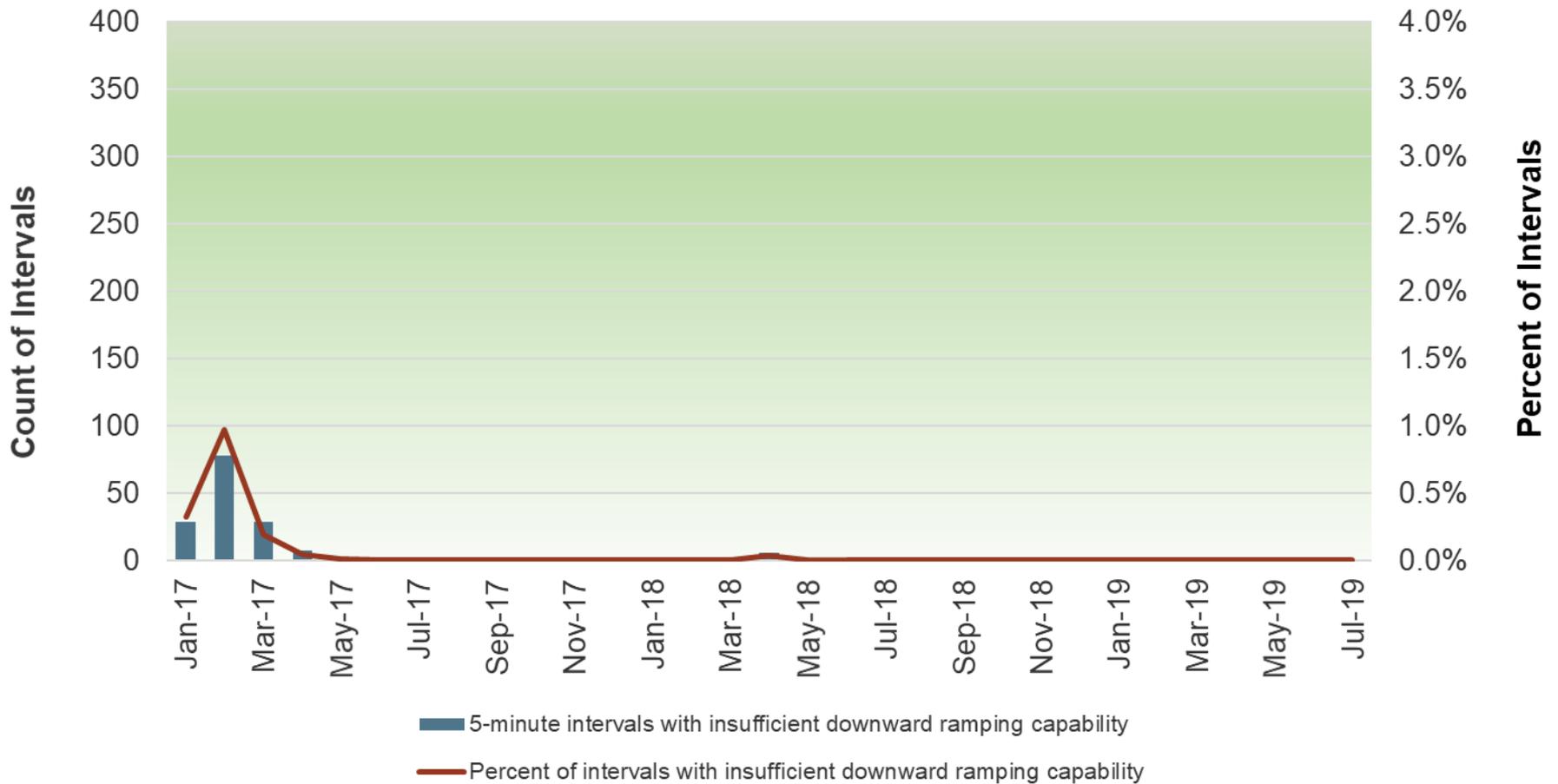
RT prices lower than DA prices for both NP15 and SP15 in July



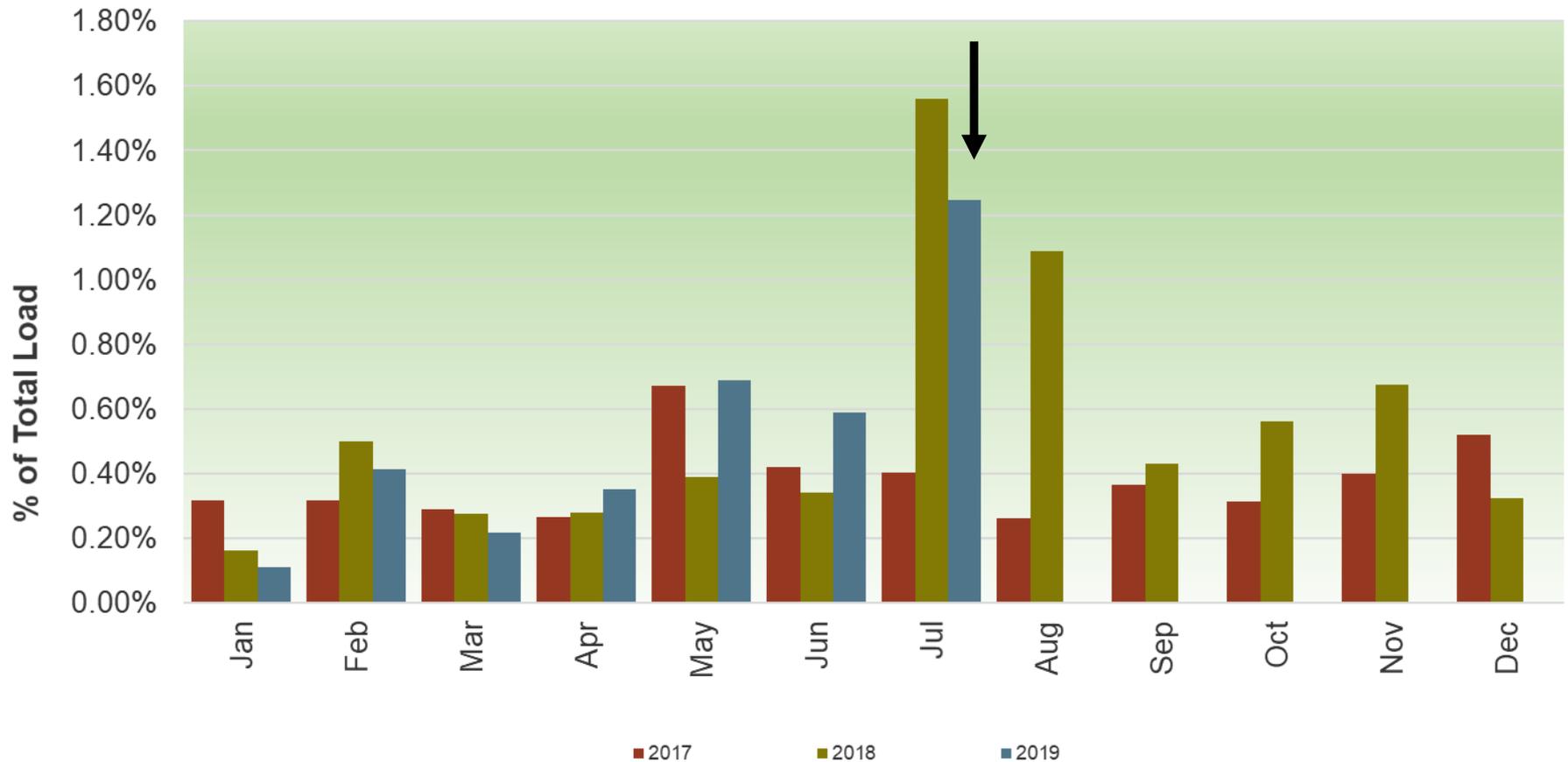
Insufficient upward ramping capacity in ISO real-time decreased in July



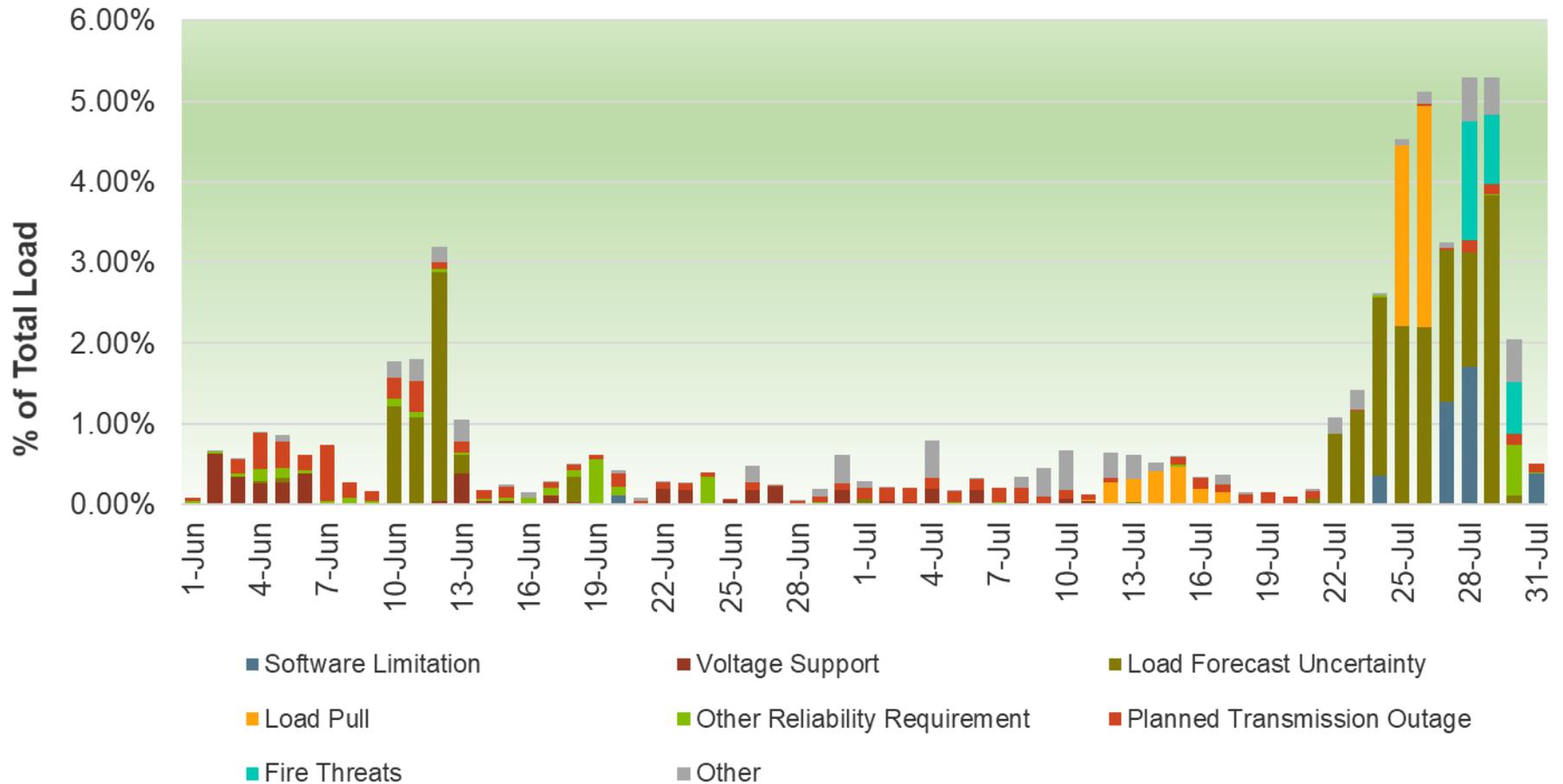
Insufficient downward ramping capacity in real-time continued to be low in June and July



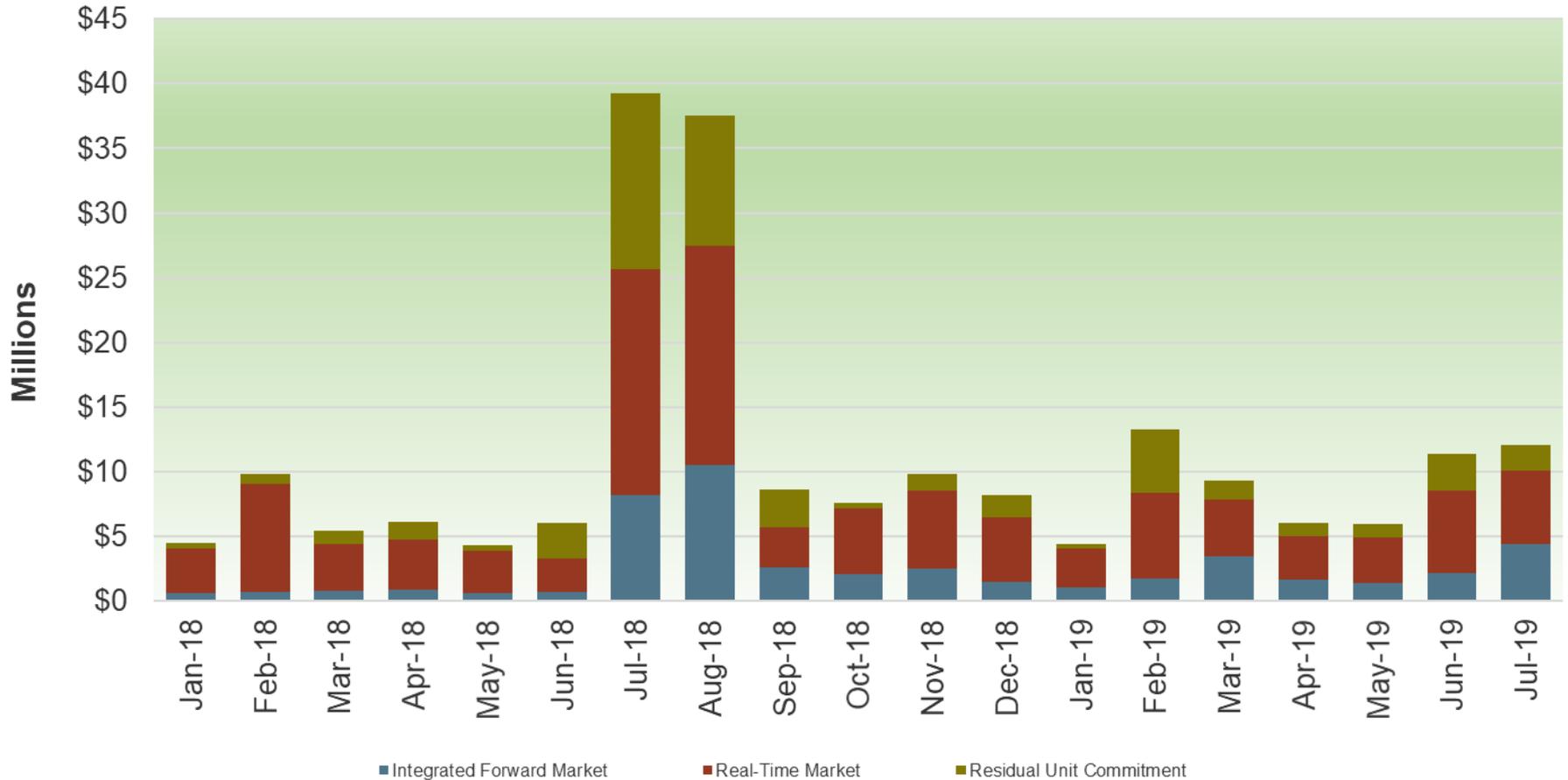
Exceptional dispatch volume in the ISO area increased in July, but still lower than previous year



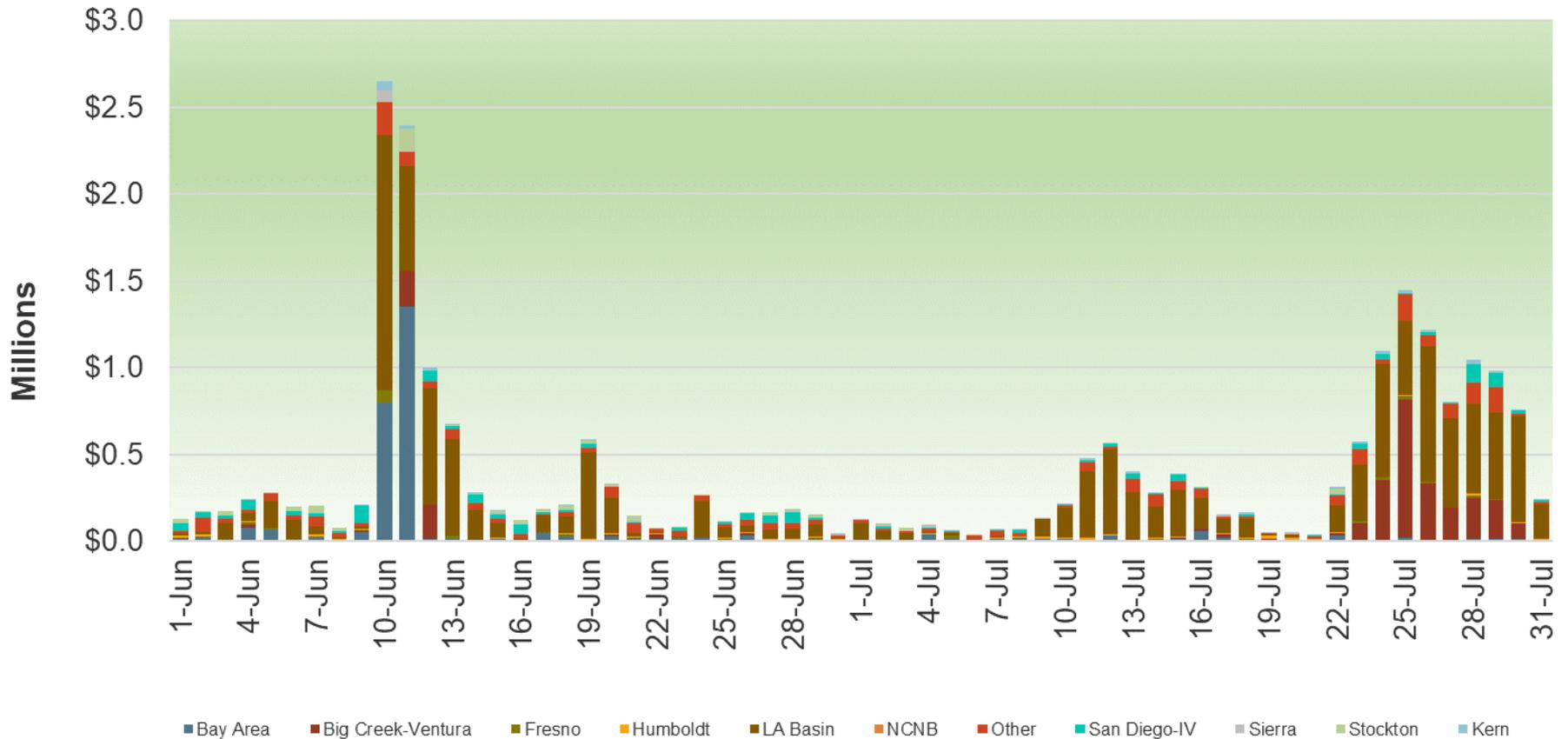
Exceptional dispatches rose in July.



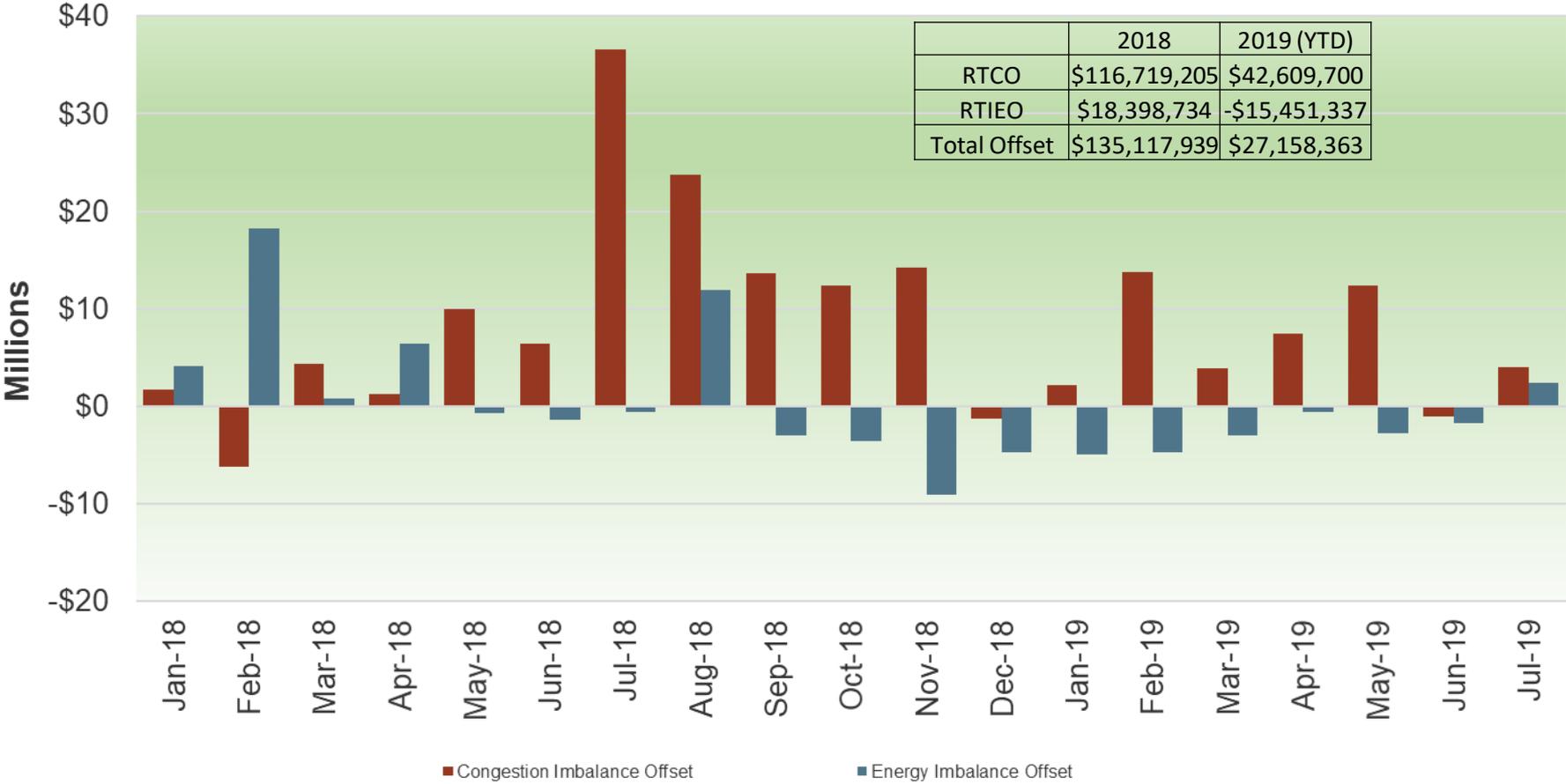
Bid cost recovery rose in June and July



Bid cost recovery (BCR) by Local Capacity Requirement area



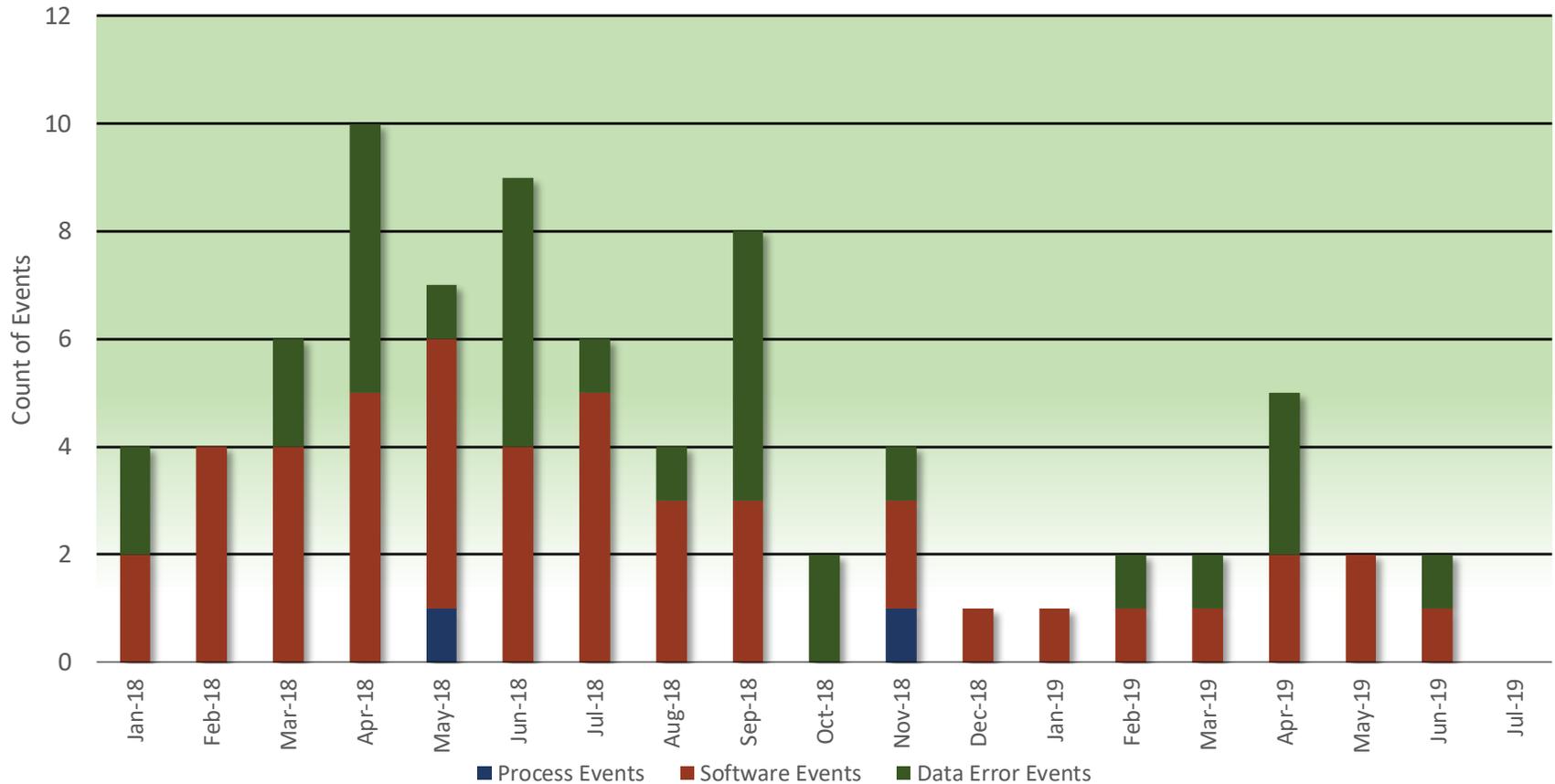
ISO area RTCO decreased since May and RTIEO increased in July



CAISO price correction events increase in July

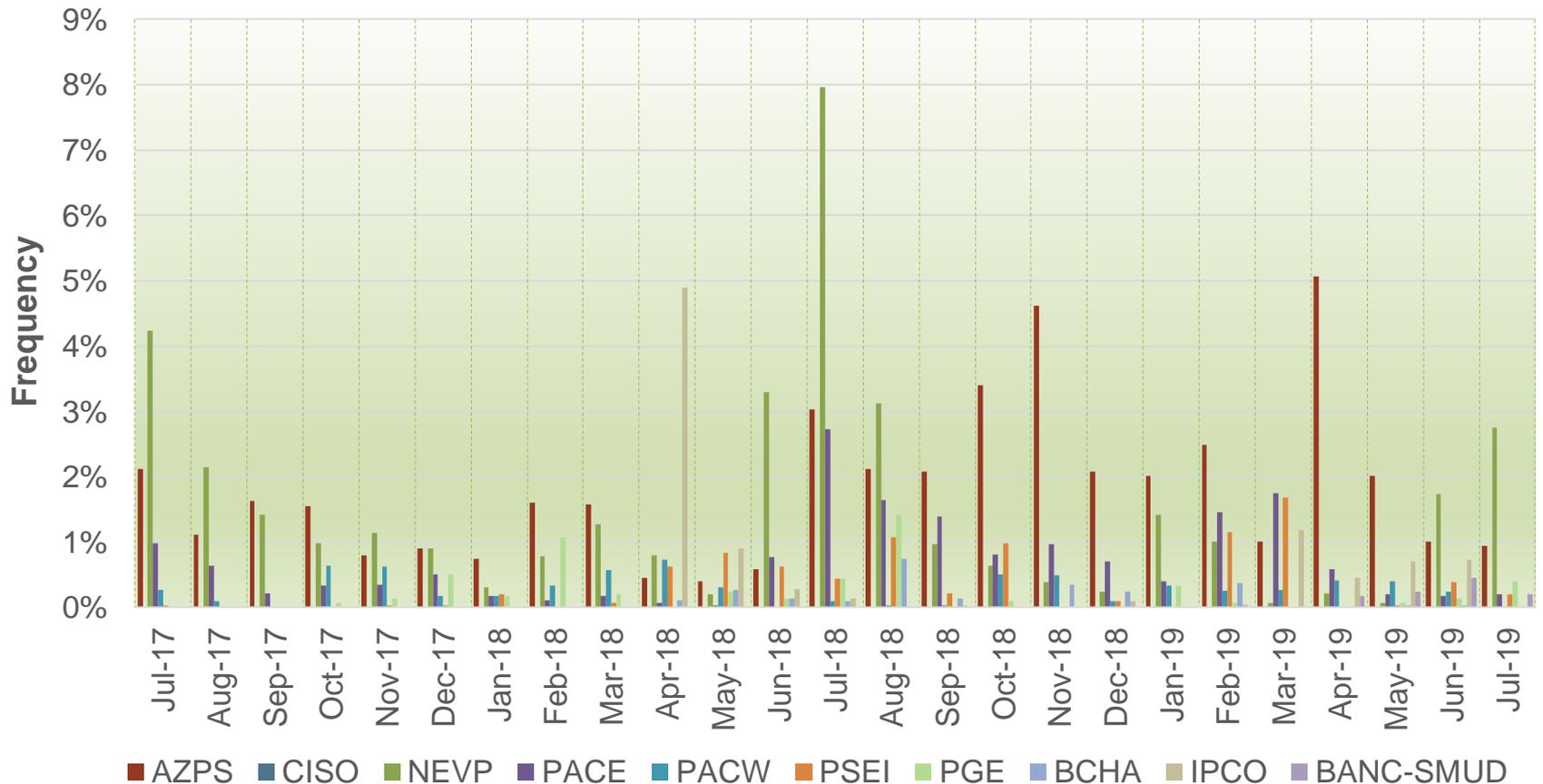


No EIM-Related price correction events were observed in July



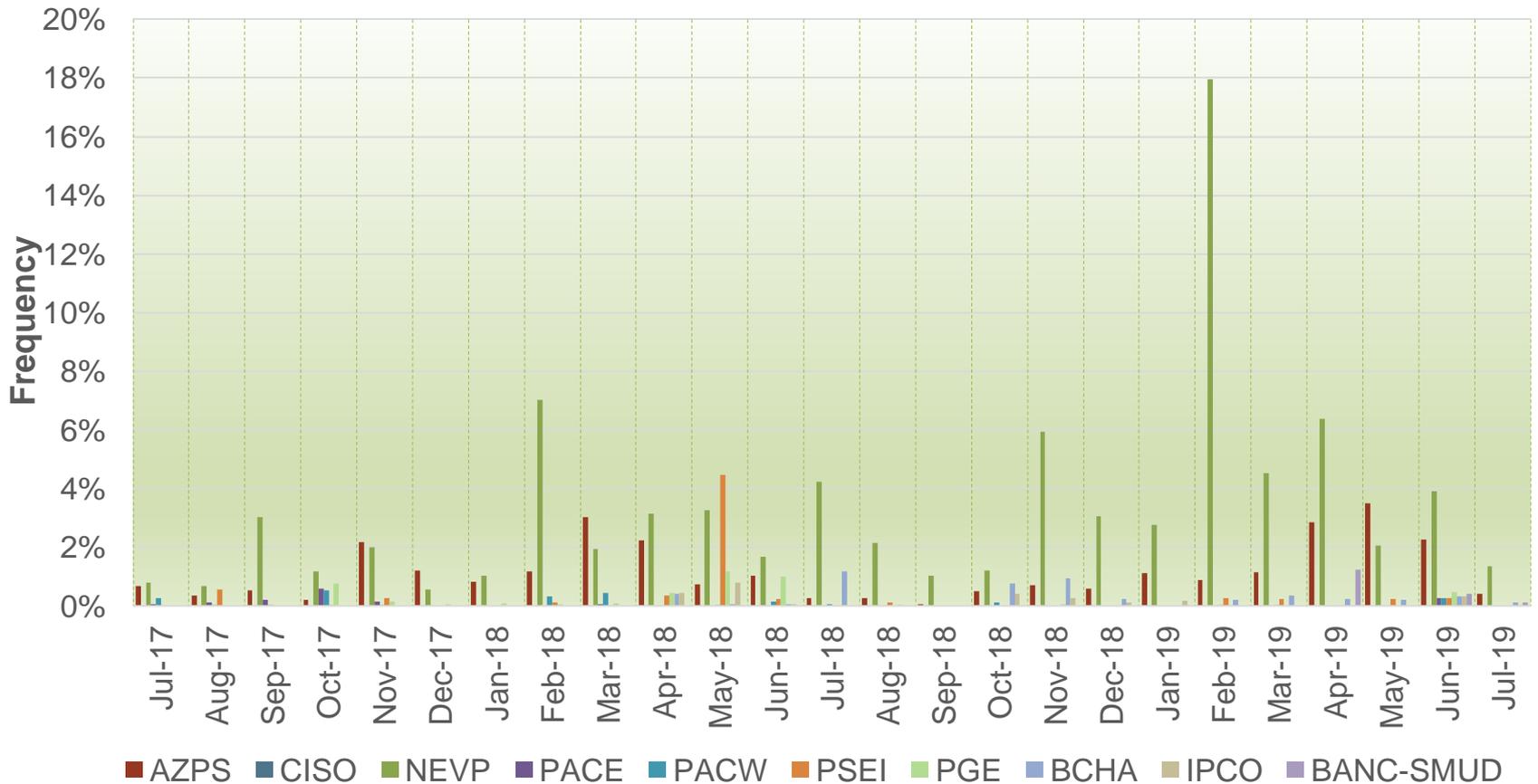
Flexible Ramp Up Sufficiency Test Results

Most BAAs Fail Flex Up Test less than 2% of intervals

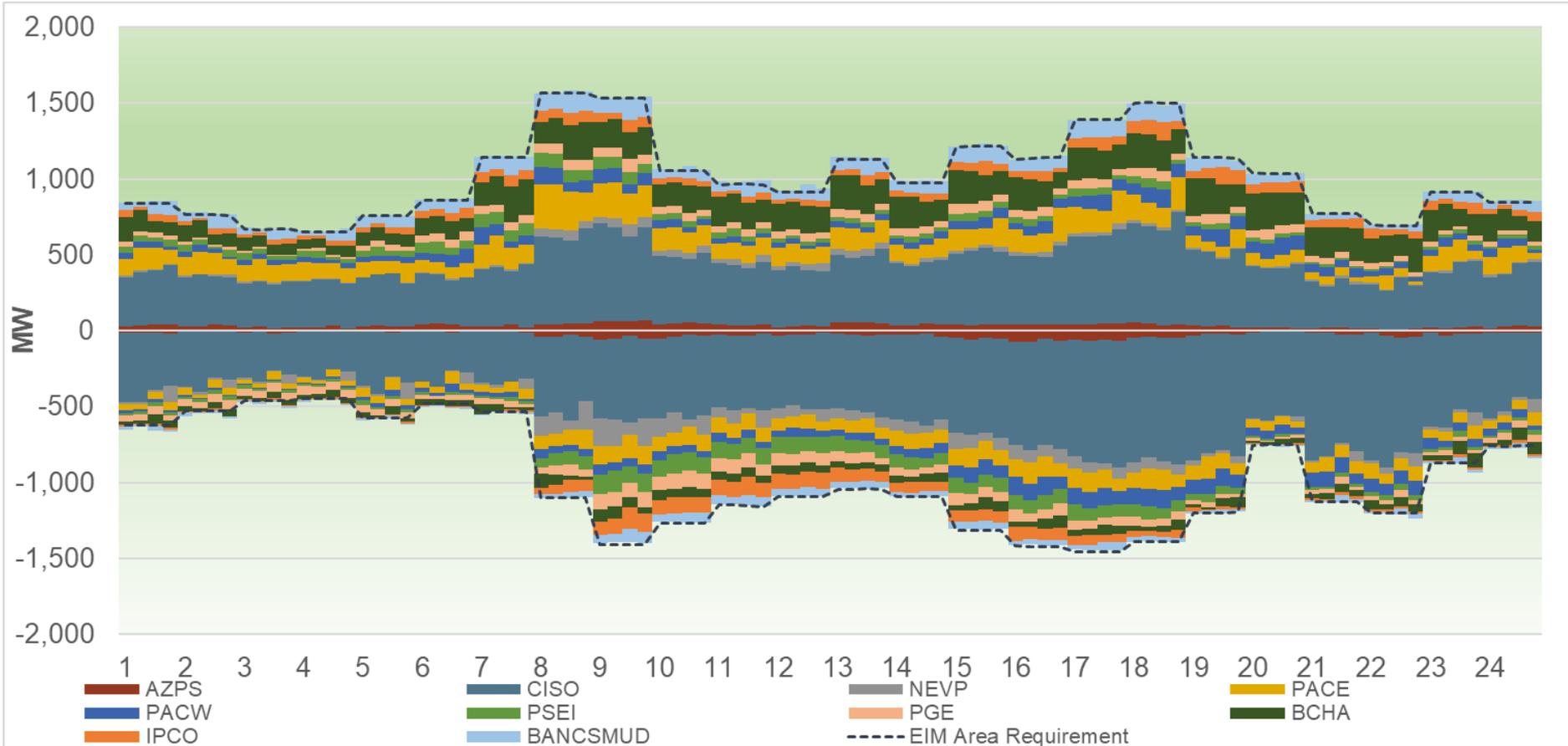


Flexible Ramp Down Sufficiency Test Results

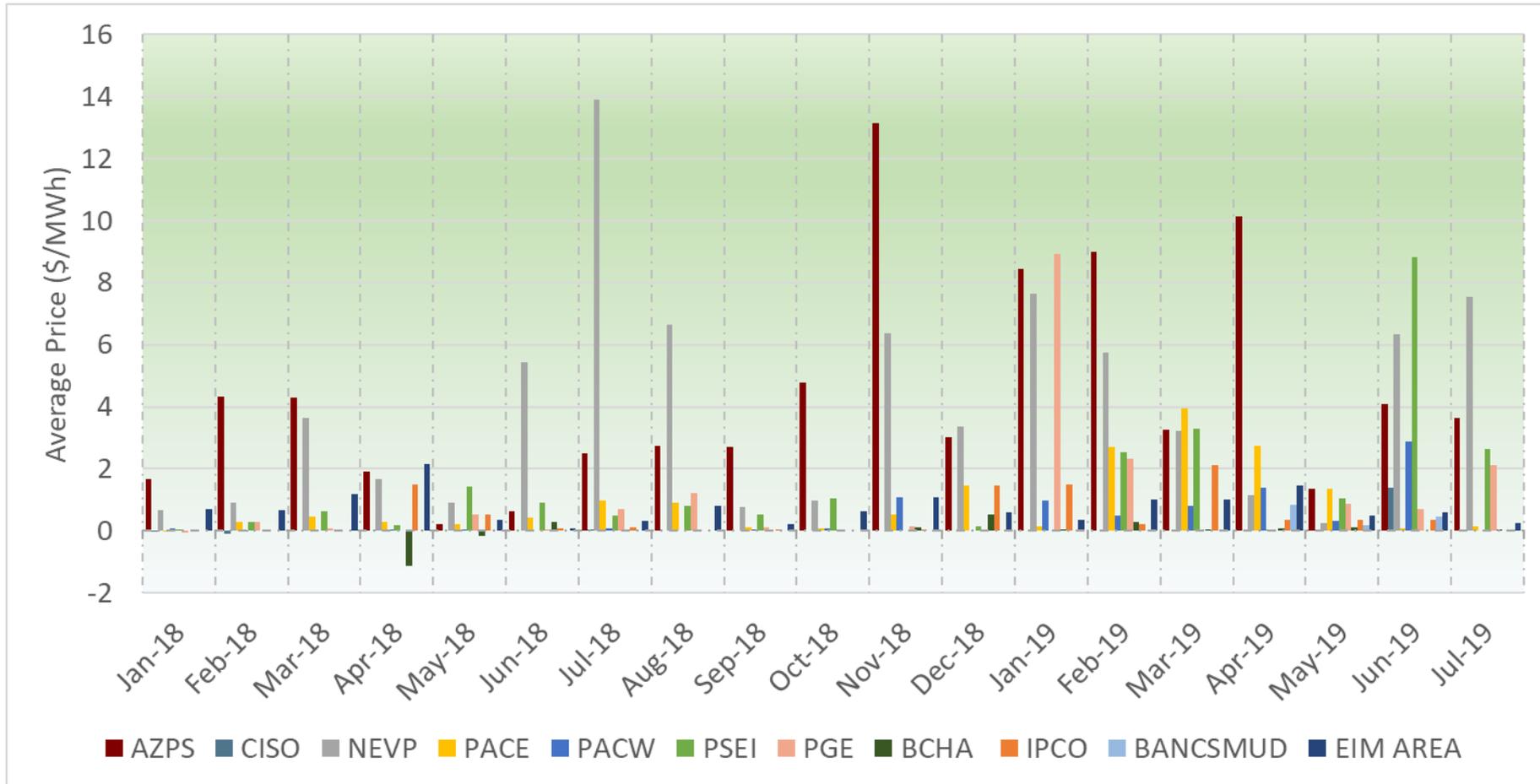
Most BAAs Fail Flex Down Test less than 2% of intervals



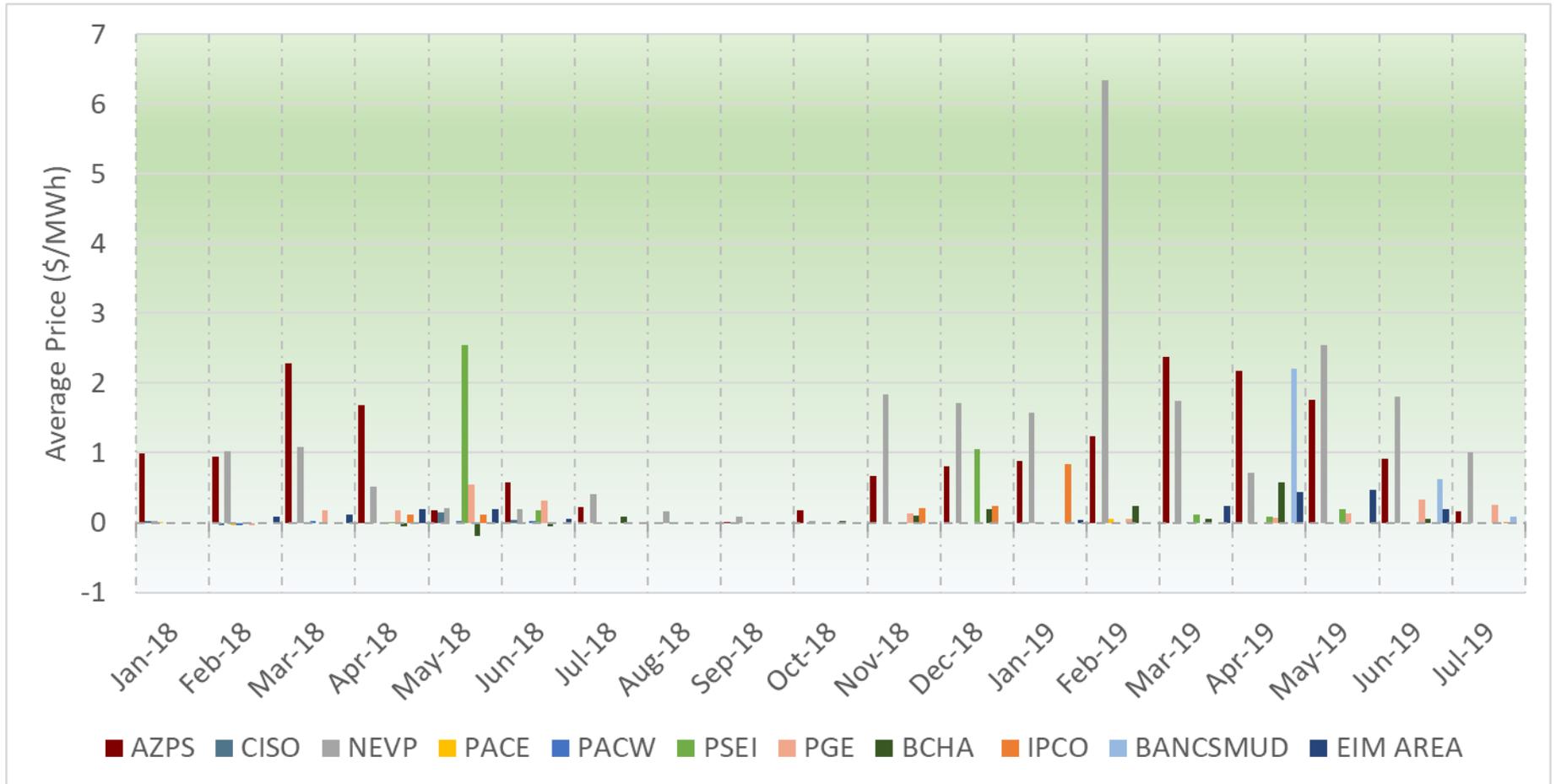
Average Flexible Ramp Product Cleared Awards for each area with EIM Area Requirement - June to July 2019



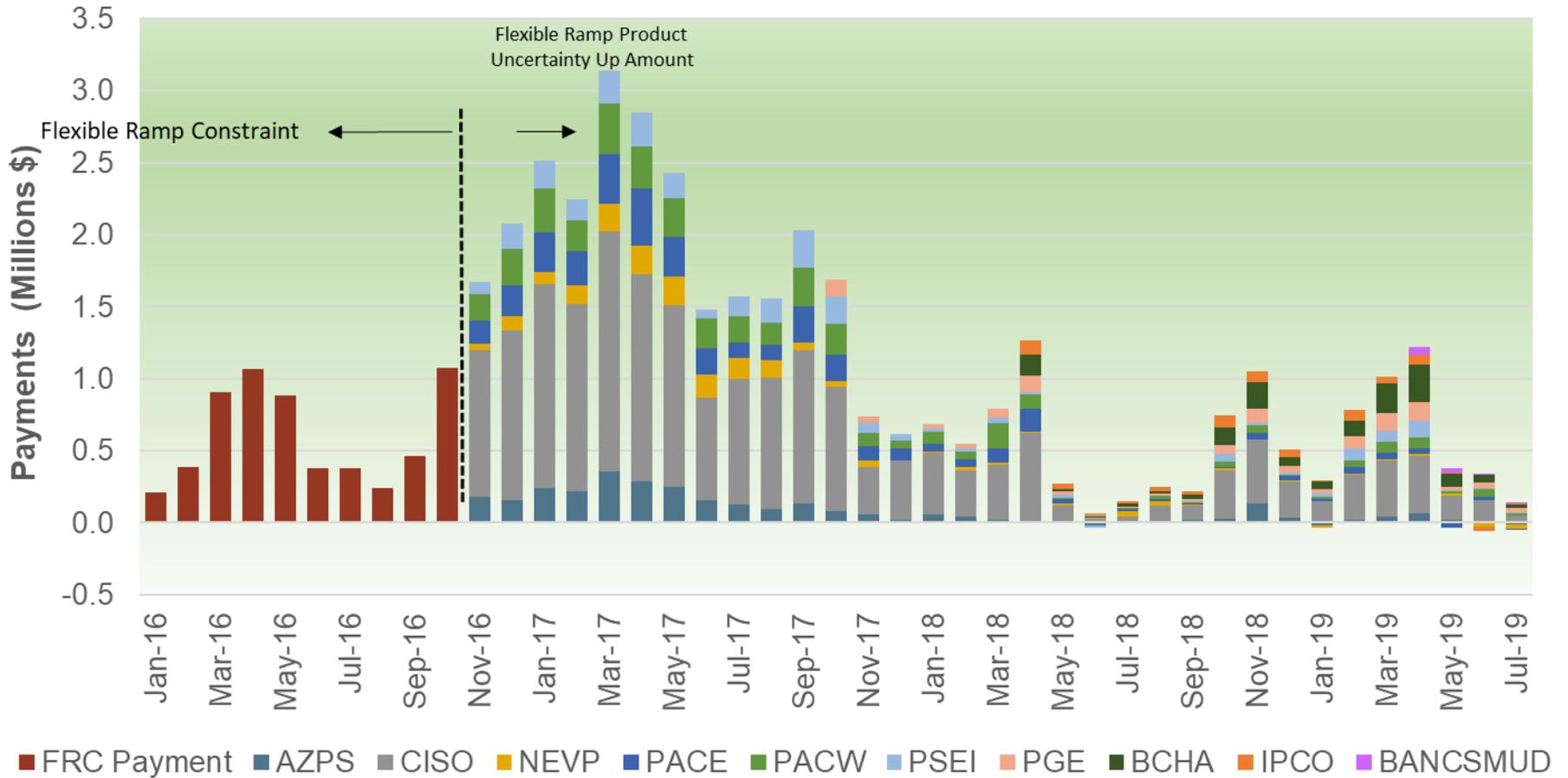
Average Flexible Ramp Up Price (\$/MWh)



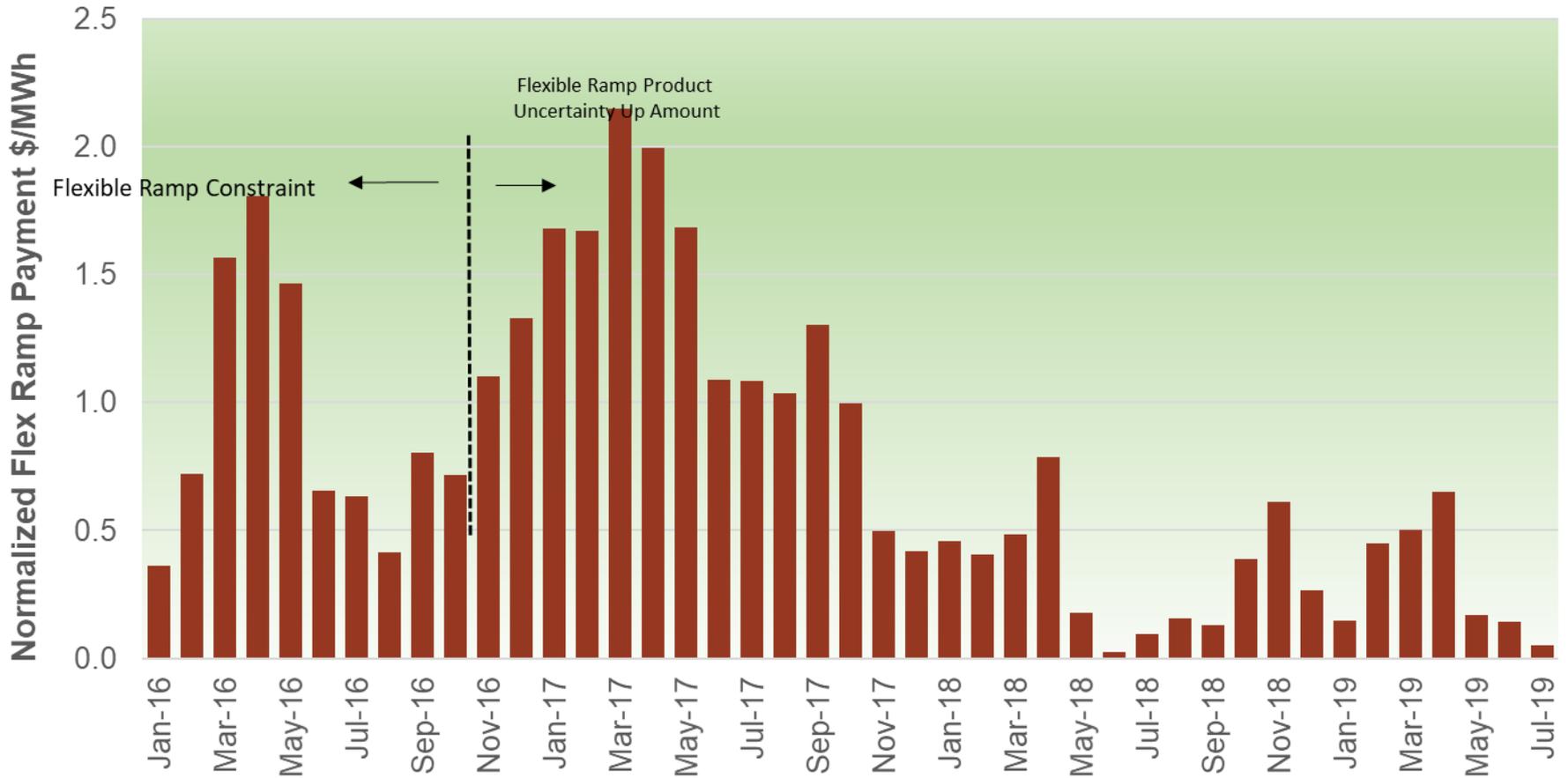
Average Flexible Ramp Down Price (\$/MWh)



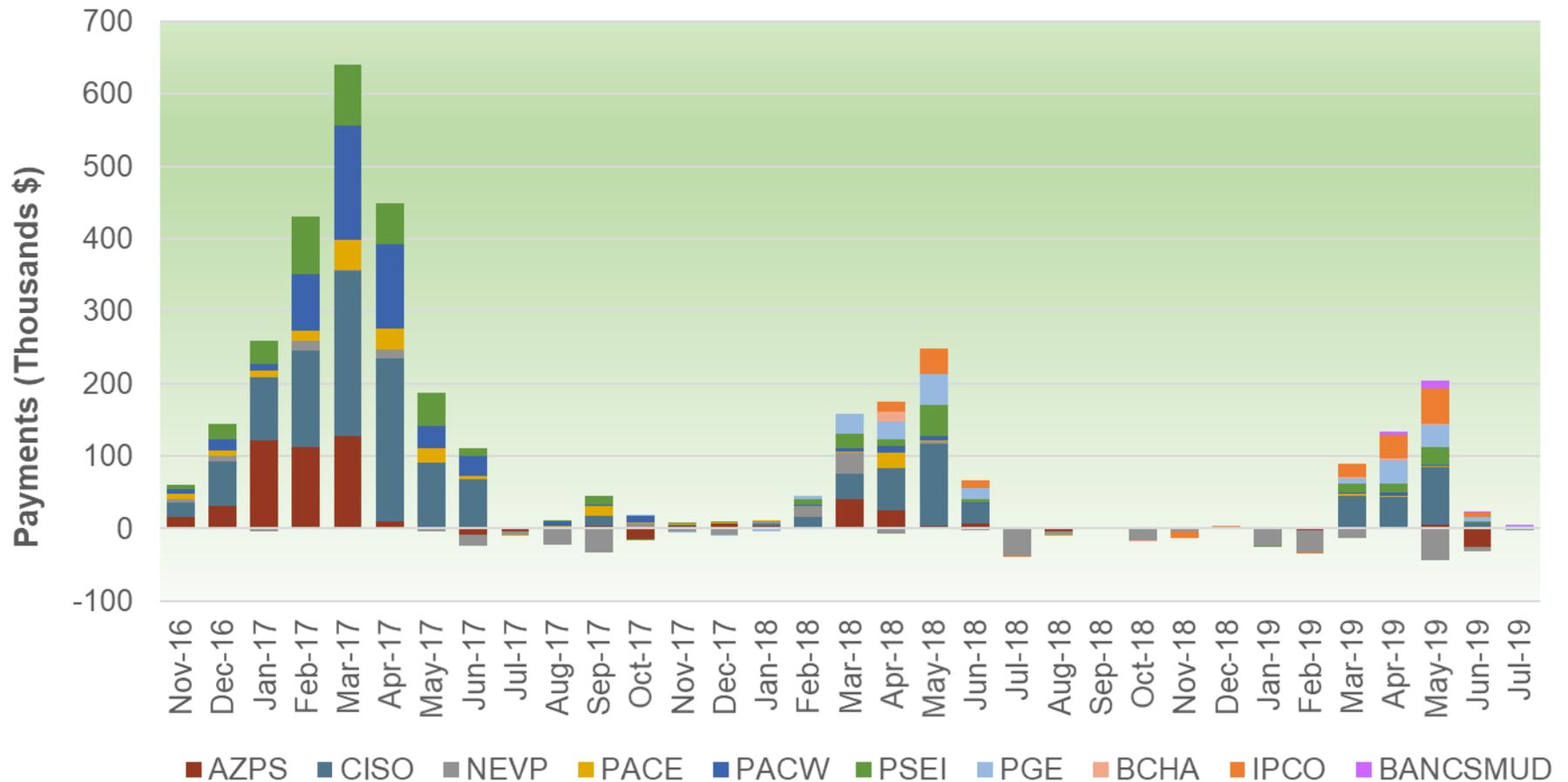
Uncertainty Up Settlement Amount



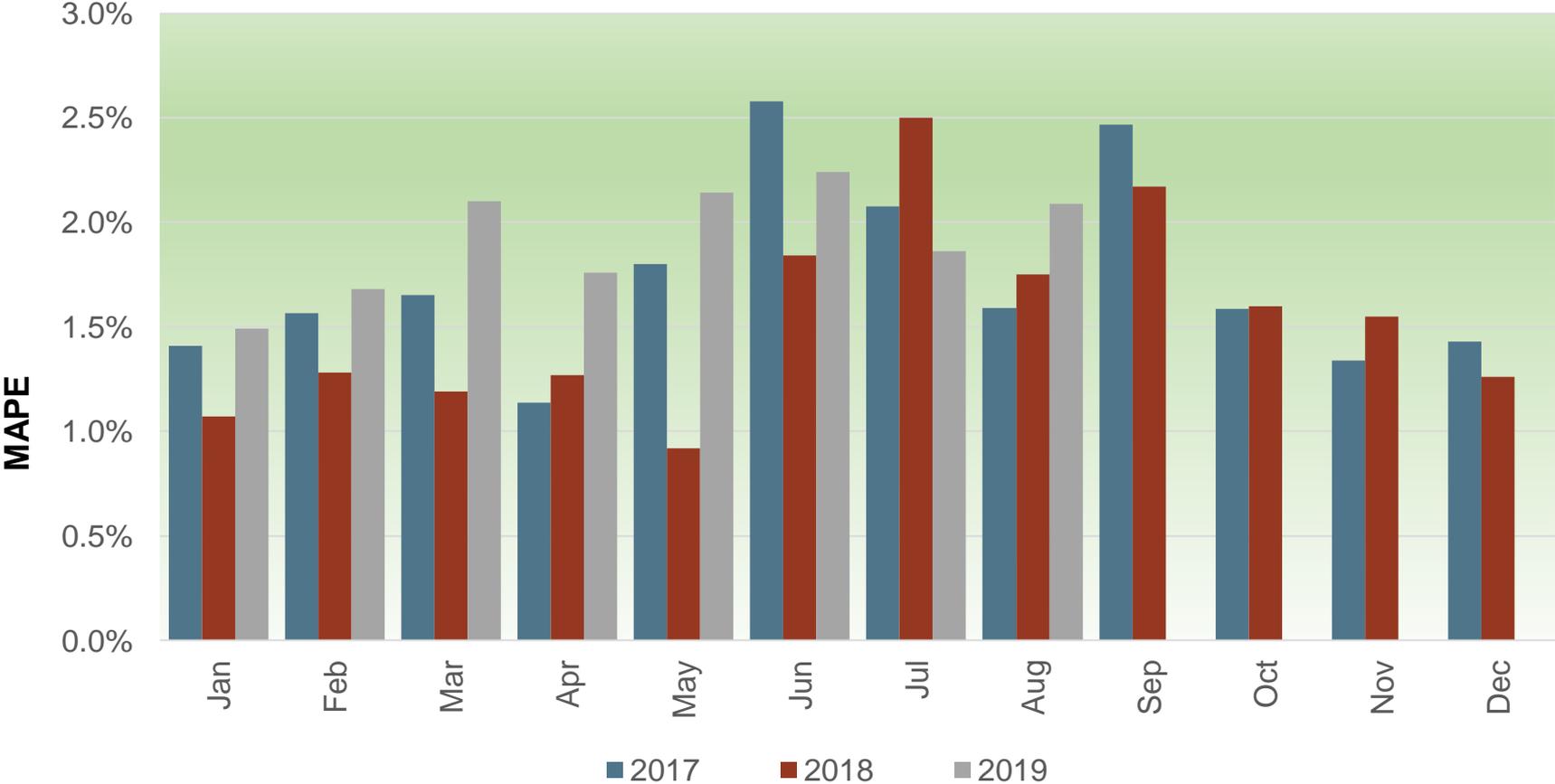
Normalized Flex Ramp Up Payment



Uncertainty Movement Down Settlement



Day-ahead load forecast



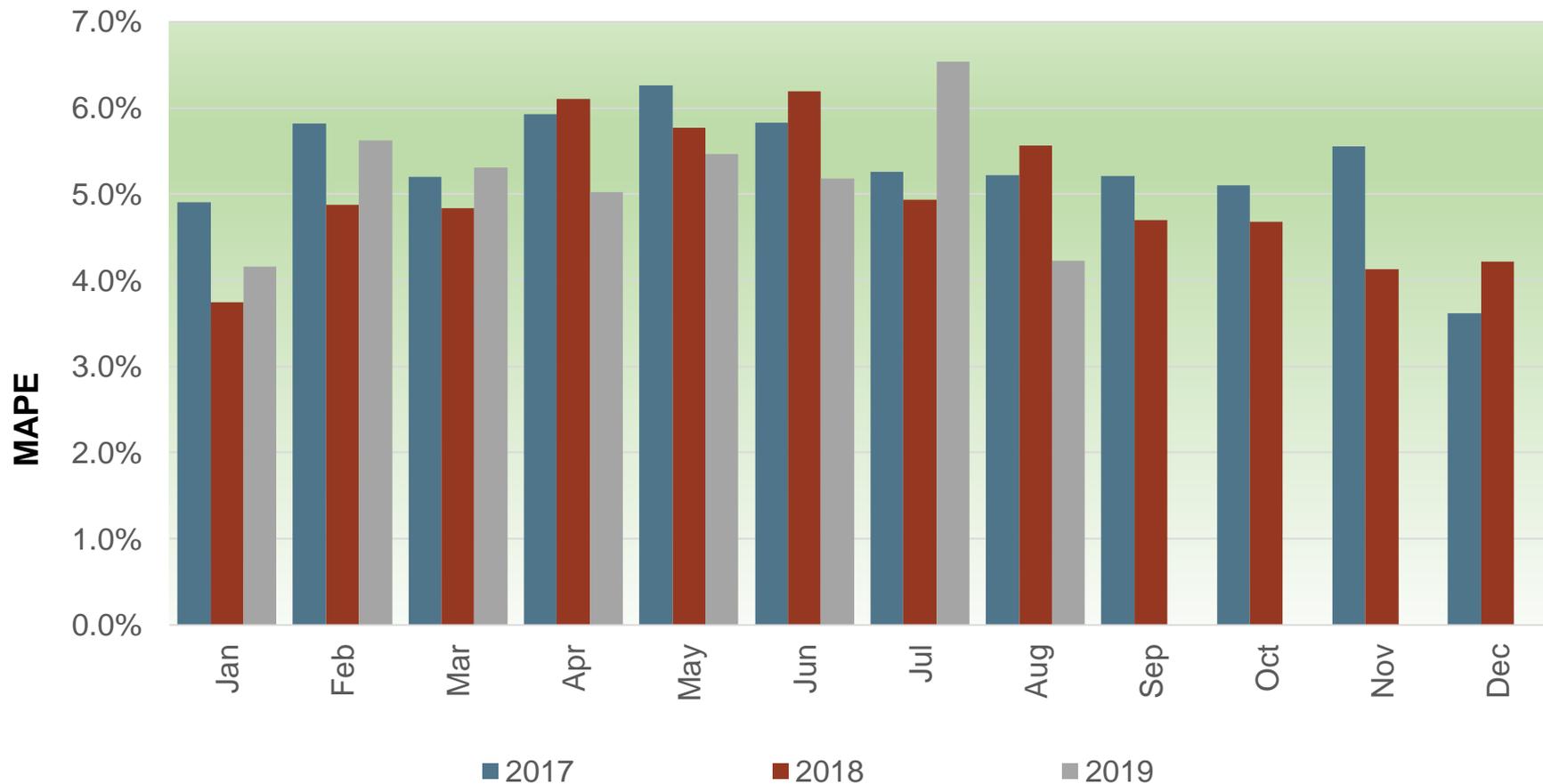
**MAPE = abs(Forecast - Actual)/Actual

Day-ahead peak to peak forecast accuracy



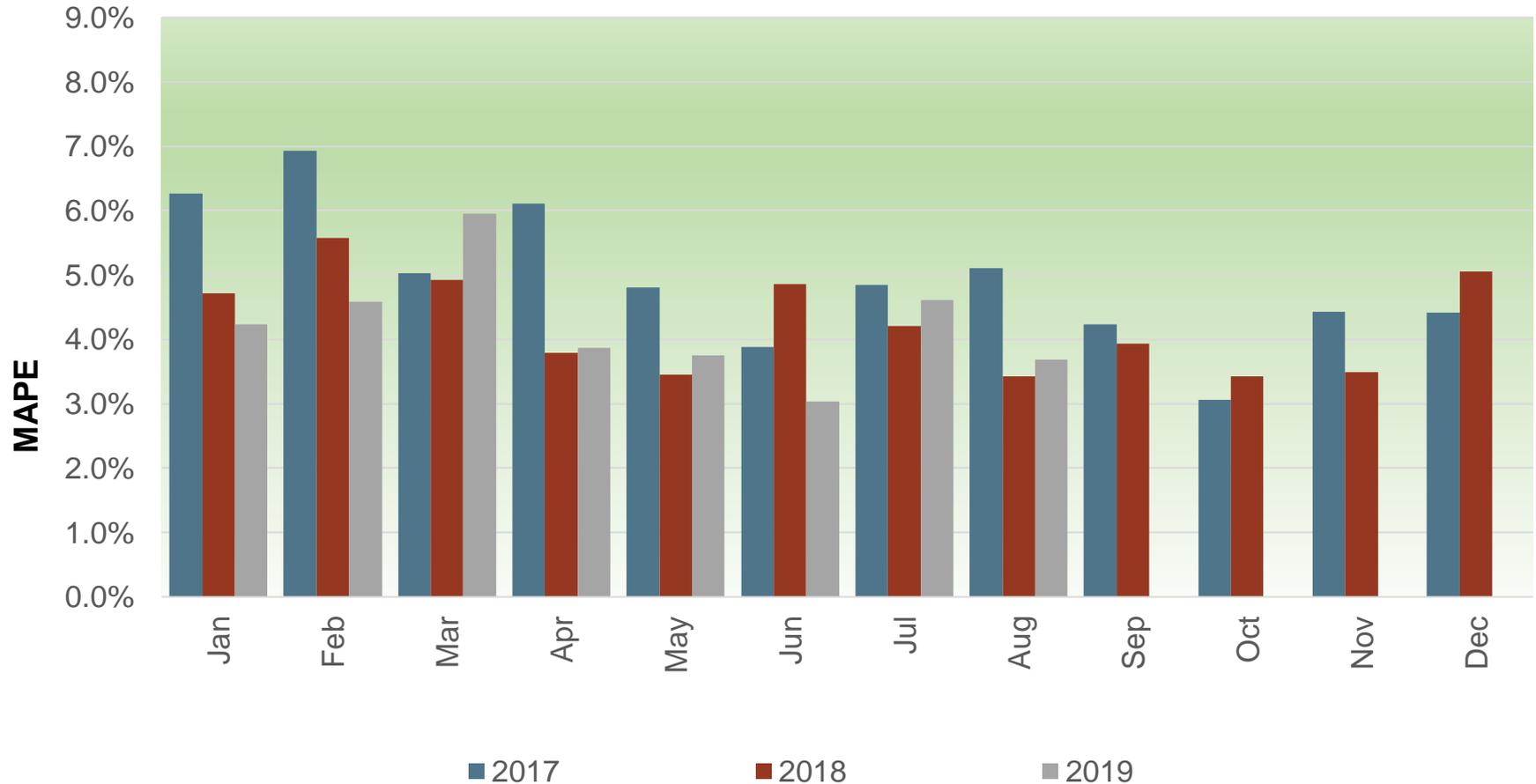
**MAPE = abs(Forecast - Actual)/Actual

Day-ahead wind forecast



**The 2017 generation data used for accuracy calculation contains the economically dispatched MW.
 **MAPE = $\text{abs}(\text{Forecast} - \text{Actual})/\text{Capacity}$

Day-ahead solar forecast



**The 2017 generation data used for accuracy calculation contains the economically dispatched MW.
 **MAPE = $\text{abs}(\text{Forecast} - \text{Actual})/\text{Capacity}$

Real-time wind forecast



The 2017 generation data used for accuracy calculation contains the economically dispatched MW.
 **This forecast accuracy is pulled directly from the CAISO Forecasting System.
 **MAPE = abs(Forecast - Actual)/Capacity

Real-time solar forecast



**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.

**MAPE = $\text{abs}(\text{Forecast} - \text{Actual}) / \text{Capacity}$

EIM T-60 Forecast

AZPS T-60 Forecast



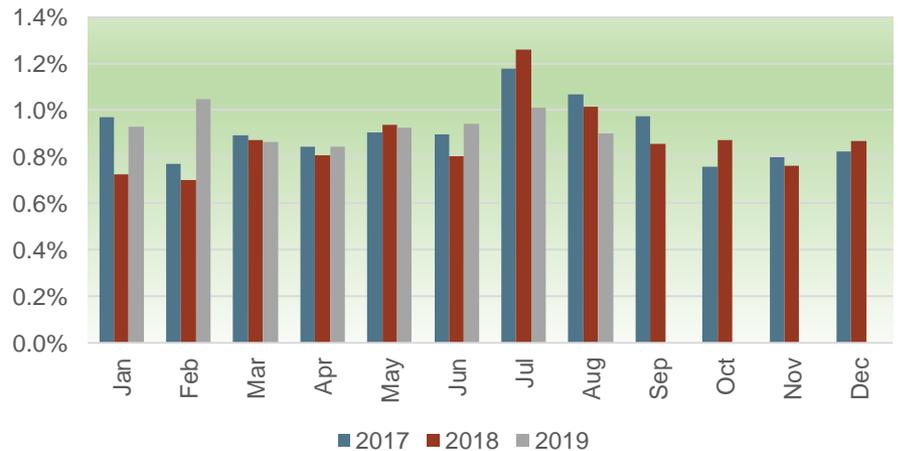
IPCO T-60 Forecast



PGE T-60 Forecast



NVE T-60 Forecast

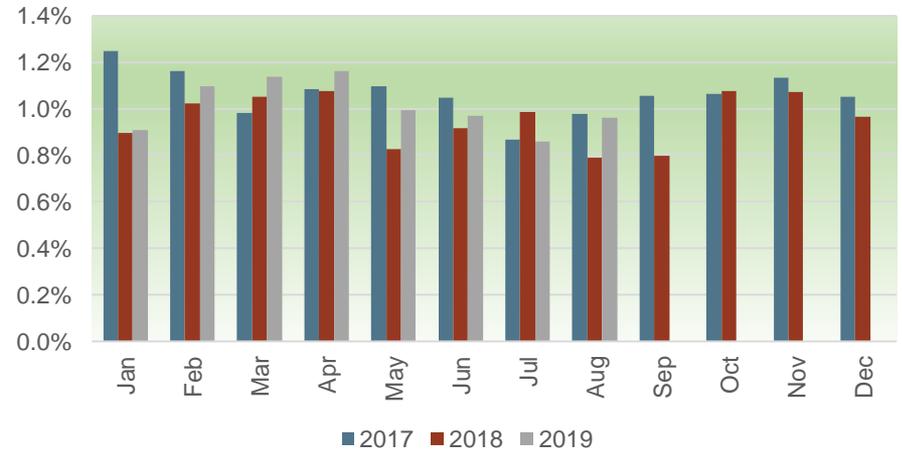


EIM T-60 Forecast

PACE T-60 Forecast



PACW T-60 Forecast



PSE T-60 Forecast



SMUD T-60 Forecast



Exceptional Dispatch Settlement

- June 2019: DMM identified the ISO was not mitigating the Exceptional Dispatch (ED) price correctly for:*
 - Test Energy: When the ED is for Instruction Type of TEST and
 - Mitigated ED: Other Reason for Dispatchable PMIN (DPMIN)
- The Test Energy ED's were being settled at:
 - Max of the Clean Bid (CB), Default Energy Bid (DEB), or Locational Marginal Price (LMP)
 - The correct settlement is the Default Energy Bid or Locational Marginal Price, whichever is higher.
- ED to DPMIN was being settled using the unmitigated settlement of Max (CB, DEB, LMP).
 - The correct mitigated exceptional dispatch settlement is:
 - Max (Min (CB, DEB), LMP)
 - Or if the CB is less than DEB, Max (CB, LMP)

*Review operating procedure 2330C for more details.

Policy Update

John Goodin

Manager, Infrastructure & Regulatory Policy

Don Tretheway

Senior Advisor, Market Design Policy

Energy Storage and Distributed Energy Resources – Phase 4

- Scope:
 - Enhancements to energy storage and distributed energy resource model and rules
- EIM Governing Body advisory role
- Status:
 - 2 working group meetings held (June 27 & Aug 21)
 - Revised Straw Proposal will be posted September 19
 - Q1 2020 EIM Governing Body briefing and ISO Board decision

Hybrid Resources

- Scope: Explore how hybrid generation resources can be registered and configured to operate within the ISO market.
- EIM Governing Body advisory role
- Status:
 - Issue Paper published July 18
 - Stakeholder meeting held August 22
 - Straw proposal planned for release September 26
 - Stakeholder meeting on straw proposal October 3

Capacity Procurement Mechanism - Soft Offer Cap

- Scope: updating the capacity procurement mechanism soft-offer cap, compensation for 12-month CPM designations, and bids above the soft offer cap.
- No EIM Governing Body role
- Status:
 - Issue Paper posted May 30
 - Straw Proposal posted July 24
 - Comments due August 20
 - ISO Board of Governors meeting spring 2020

Resource Adequacy Enhancements

- Scope: Considering reforms needed to the ISO's resource adequacy rules, requirements, and processes to ensure the future reliability and operability of the grid.
- No EIM Governing Body role
- Status:
 - Second Revised Straw Proposal September 24
 - Stakeholder meeting on Second RSP October 1 & 2
 - ISO Board of Governors Meeting Q2 2020

Transmission Access Charge Structure Enhancements

- Scope: Considers changes to the ISO's current volumetric Transmission Access Charge structure for recovering PTOs' costs of owning, operating and maintaining transmission facilities under ISO operational control.
- No EIM Governing Body role
- Status:
 - Policy development completed
 - Review in context of Extended DA Market initiative outcomes
 - ISO Board of Governors Meeting Feb 2020
 - Targeting 2021 implementation for 2022 rates

Day-Ahead Market Enhancements

- **Scope:**
 - Day-ahead imbalance reserve product
 - Deliverability of reserve products
- **EIM Governing Body Role:**
 - EIM Governing Body Charter specifies advisory role for components that change real-time market rules
 - However, Management believes it will be appropriate for the EIM Governing Body have advisory role for entire initiative
 - Foundational to extending day-ahead market to EIM entities
- **Status:**
 - Additional technical workshop held on August 13 and MSC discussion on August 19
 - Reviewing stakeholder comments to determine next steps
 - Q1 2021 EIM Governing Body briefing and ISO Board decision

Import Bid Cost Verification & FERC Order 831 – Bid Cap

- **Scope:**
 - FERC Order 831 requires the ISO to raise its energy bid cap to \$2,000/MWh and requires cost verification for internal resource bids greater than \$1,000/MWh
 - Initiative is developing cost verification for import bids above \$1,000/MWh
 - Further examine changes to ISO market constraint relaxation prices under \$2,000/MWh bid cap
- **EIM Governing Body advisory role**
- **Status:**
 - Prioritizing completion of straw dog for system market power
 - ISO will request deferred implementation of Order 831 to Fall 2020 to allow additional time to develop ex-ante verification for import bids
 - Q2 2020 EIM Governing Body briefing and ISO Board decision

System Market Power Mitigation

- **Scope:**
 - Review results of ISO's analysis of ISO balancing authority area's structural competitiveness
 - Determine if measures are appropriate to address system-level market power
- **EIM Governing Body advisory role**
- **Status:**
 - Further discussions at August 19 MSC meeting Working group meeting planned for September 20 to discuss potential measures for addressing system-level market power
 - Anticipate MSC commenting on potential measures at October 11 meeting leading to MSC opinion for November BOG

Market Settlement Timeline

- **Scope:**
 - Revise market settlement timelines to be more efficient and better accommodate business needs
- **EIM Governing Body advisory role**
- **Status:**
 - Revised straw proposal posted on August 15
 - Comments due on September 6
 - Draft final proposal planned for September 19
 - October EIM Governing Body briefing and November ISO Board decision

Release Plan Update

Adrian Chiosea

Manager, Strategic Initiative Management

The ISO offers innovative training programs

Date	Training courses and workshops
August 26	Pre-Market Sim Training – ESDER 3A (Webinar)
August 27	Pre Market Sim Training – RT Market Neutrality (Webinar)
August 29	Pre Market Sim Training – LMPME (Webinar)
September 26	Welcome to the ISO (Webinar)
October 8	Pre Market Sim Training - CCDEBE Phase 1 (Webinar)



CustomerTraining@caiso.com

New Modules (recorded webinar and slides)

You can find new initiatives training courses on the learning center web page below. More resources will be added throughout 2019 in accordance with project schedules.

Computer Based Training

There are more than 20 computer based training modules on the ISO website covering:

- | | |
|--------------------------|-----------------------------------|
| • Markets and Operations | • Settlements and Metering |
| • Reference Materials | • Western Energy Imbalance Market |

Visit our **Learning Center** web page to access our training calendar, register for courses and find other informational resources:

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

Release Plan Summary: 2019

Fall 2019

- Commitment Costs and Default Energy Bid Enhancements Phase 1
- Energy Storage and Distributed Energy Resources Phase 3A
- RMR and CPM Enhancements
- Local Market Power Mitigation Enhancements
- EIM 2019 Enhancements
- FERC Order 841 – Energy Storage Resources
- Real-Time Market Neutrality Settlement

Spring 2020

- Energy Imbalance Market (EIM) - 2020 Salt River Project
- Energy Imbalance Market (EIM) - 2020 Seattle City Light

Independent 2020

- Automated Dispatch System (ADS) User Interface (UI) Replacement

Fall 2020

- Commitment Costs and Default Energy Bid Enhancements Phase 2
- Contingency Modeling Enhancements - Transmission
- Energy Storage and Distributed Energy Resources Phase 3B
- Dispatch Operating Target Tariff Clarifications
- Intertie Deviation Settlement
- Excess Behind the Meter Production
- Capacity Procurement Mechanism Soft Offer Cap (BOG Q1 2020)
- Import Bid Cost Verification (BOG June 2020)

Release Plan Summary: 2020 - 2022

Spring 2021

- Energy Imbalance Market (EIM) 2021 - Public Service Company of New Mexico
- Energy Imbalance Market (EIM) 2021 - North-Western Energy
- Energy Imbalance Market (EIM) 2021 - Los Angeles Dept. of Water and Power
- Energy Imbalance Market (EIM) 2021 - Turlock Irrigation District

Fall 2021 – tentative, subject to impact assessment

- Day Ahead Market Enhancements (BOG Q1 2021)
- RA Enhancements (BOG May/June 2020)
- Energy Storage and Distributed Energy Resources Phase 4 (BOG Q1 2020)
- TAC Structure Enhancements (BOG Feb 2020)
- Market Settlement Timeline Transformation (BOG Nov 2019)

Spring 2022

- Energy Imbalance Market (EIM) 2022 - Avista
- Energy Imbalance Market (EIM) 2022 - Tucson Electric Power

Release Schedule 2019

Date of Data Refresh: 8/9/2019



Legend	
Market Simulation	CA ISO Holiday
External Testing	Deployment Week

7/29/19 - 8/4/19
8/12/19 - 8/18/19
8/19/19 - 8/25/19
8/26/19 - 9/1/19
9/2/19 - 9/8/19
9/16/19 - 9/15/19
9/23/19 - 9/22/19
9/30/19 - 9/29/19
10/7/19 - 10/6/19
10/14/19 - 10/13/19
10/21/19 - 10/20/19
10/28/19 - 10/27/19
11/4/19 - 11/3/19
11/11/19 - 11/10/19
11/18/19 - 11/17/19
11/25/19 - 11/24/19
12/2/19 - 12/1/19
12/9/19 - 12/8/19
12/16/19 - 12/15/19
12/23/19 - 12/22/19
12/30/19 - 1/5/20

MAP Stage Environment Window

Fall 2019 Release Maintenance	Fall 2019 Release Maintenance (08/19-09/03)
CCDEBE1	CCDEBE1 (09/03-11/21)
CCDEBE1 - Market Sim	CCDEBE1 - Market Sim (09/03-11/21)
ESDER3A	ESDER3A (09/03-10/11)
ESDER3A - Market Sim	ESDER3A - Market Sim (09/03-10/11)
RMRC PME	RMRC PME (09/03-10/11)
RMRC PME - Market Sim	RMRC PME - Market Sim (09/03-10/11)
LMPME	LMPME (09/03-10/11)
LMPME - Market Sim	LMPME - Market Sim (09/03-10/11)
EIM2019	EIM2019 (09/03-10/11)
EIM2019 - Market Sim	EIM2019 - Market Sim (09/03-10/11)
FERC841	FERC841 (09/03-10/11)
FERC841 - Market Sim	FERC841 - Market Sim (09/03-10/11)
RTM Neutrality Settlement	RTM Neutrality Settlement (09/03-10/11)
RTM Neutrality Settlement - Market Sim	RTM Neutrality Settlement - Market Sim (09/03-10/11)
EIM 2020 SRP & SCL	EIM 2020 SRP & SCL (12/03-01/31)
EIM 2020 SRP & SCL - Market Sim	EIM 2020 SRP & SCL - Market Sim (12/03-01/31)

Production Environment Window

RTM Neutrality Settlement Effective Date	RTM Neutrality Settlement Effective Date (08/01)
FNM DB 2019Q3	FNM DB 2019Q3 (09/17-09/19)
ESDER3A - DRRS	ESDER3A - DRRS (11/06-11/06)
ESDER3A	ESDER3A (11/13)
RMRC PME Implementation	RMRC PME Implementation (11/13)
LMPME	LMPME (11/13)
EIM2019	EIM2019 (11/13)
FERC841	FERC841 (11/13)
RTM Neutrality Settlement Implementation	RTM Neutrality Settlement Implementation (11/13)
FNM DB 2019M11	FNM DB 2019M11 (11/19-11/21)
CCDEBE1	CCDEBE1 (12/04)
RMRC PME Effective Date	RMRC PME Effective Date (01/01)

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



ISO PUBLIC

2019 Fall Release

Fall 2019 Release – Overview

	Board Approval	External BRS	Config. Guide	Technical Specifications	Mkt Sim Scenarios	Draft Tariff*	BPMs	External Training	Market Sim	Production Activation
Fall 2019 Release - Overview		04/01/19	05/17/19	05/17/19	05/17/19	07/14/19	08/26/19	08/26/19	09/03/19 – 10/11/19	11/13/19
CCDEBE1	03/22/18	07/19/19 09/03/19	N/A	05/17/19 CMRI 07/10/19 SIBR	N/A	05/10/19	09/26/19	08/29/19	10/14/19 – 11/04/19	12/04/19
ESDER3A	09/05/18	07/18/19	05/17/19 07/08/19	05/16/19 MF, DRRS, MRI-S	06/19/19 v1.1	05/28/19	07/30/19	08/26/19	09/03/19 – 10/11/19	11/06/19 - DRRS 11/13/19
RMR-CPME	03/28/19	07/25/19	06/03/19 07/08/19	N/A	06/27/19 v1.0	04/03/19	08/26/19	08/28/19	09/03/19 – 10/11/19	11/13/19 Effective 01/01/19
LMPME	03/28/19	04/01/19	N/A	05/16/19 CMRI 06/28/19 MF	06/17/19 v1.1	04/16/19	09/05/19	08/29/19	09/03/19 – 10/11/19	11/13/19
EIM2019	N/A	08/12/19	05/17/19	05/17/19 CMRI 07/03/19 BSAP 07/19/19 OASIS	N/A	N/A	07/30/19	08/26/19	09/03/19 – 10/11/19	11/13/19
FERC841	N/A	06/20/19	06/03/19	N/A	N/A	N/A	8/21/09 8/30/09	N/A	09/03/19 – 10/11/19	11/13/19
RTM Neutrality Settlement	07/25/19	08/07/19	07/31/19	N/A	N/A	07/30/19	08/26/19	08/27/19	09/03/19 – 10/11/19	11/13/19 Effective 08/01/19

Notes:

Items in **BLUE** are complete

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

*Draft Tariff dates have been updated to show only the draft tariff posting. FERC Filing dates can be seen on individual project slides.

Fall 2019 Release – System Interface Changes

MF

Project	Change Type	API Service Name & Major Version, Artifacts	Minor Version	RDT	MAP Stage	Production Activation	Technical Specifications
ESDER3A LMPME CCDEBE1	Modify	RetrieveGeneratorRDT_MFRDv4 RetrieveGeneratorRDT_MFRDv4_DocAttach	20191001		Sep 5, 2019	Nov 13, 2019	5.1
ESDER3A LMPME	Modify	SubmitGeneratorRDT_MFRDv4 SubmitGeneratorRDT_MFRDv4_DocAttach	20191001	GRDT v13.0	Sep 5, 2019	Nov 13, 2019	5.1

SIBR/BSAP

System	Project	Change Type	API Service Name & Major Version, Artifacts	MAP Stage	Production Activation	Technical Specifications
SIBR	CCDEBE1	Modify	RetrieveCleanBidSet_SIBRv5 RetrieveCleanBidSet_SIBRv5_DocAttach	Oct 14, 2019	Dec 4, 2019	v13.1
SIBR	CCDEBE1	Modify	RetrieveCurrentBidResults_SIBRv5 RetrieveCurrentBidResults_SIBRv5_DocAttach	Oct 14, 2019	Dec 4, 2019	v13.1
SIBR	CCDEBE1	Modify	SubmitRawBidSet_SIBRv5 SubmitRawBidSet_SIBRv5_DocAttach	Oct 14, 2019	Dec 4, 2019	v13.1
BSAP	EIM 2019	Modify	RetrieveBalancingTestResults_BSAPv2 RetrieveBalancingTestResults_BSAPv2_DocAttach	Sep 3, 2019	Nov 13, 2019	1.7

Fall 2019 Release – System Interface Changes

CMRI

Project	Change Type	UI Change	API Service Name & Major Version, Artifacts	MAP Stage	Production Activation	Technical Specifications
LMPME CCDEBE1	Modify	Tab: Default Bids Existing Report: Default Energy Bid Curves	RetrieveDefaultBidCurves_CMRIv2 RetrieveDefaultBidCurves_CMRIv2_DocAttach *8/12/19: Service wsdl files retrieveDefaultBidCurves_v2.wsdl and retrieveDefaultBidCurves_v2_DocAttach.wsdl are updated to refer the correct version of XSD files. *8/15/19: Note: This will include Publication timestamp in DefaultBidCurve_v2	Sep 9, 2019	Nov 13, 2019	3.9.1
LMPME	Modify	Tab: Default Bids Existing Report: Default Commitment Costs	RetrieveExternalDefaultCommitmentCost_CMRIv1 RetrieveExternalDefaultCommitmentCost_CMRIv1_DocAttach	Sep 9, 2019	Nov 13, 2019	3.9.1
EIM 2019	New	Tab: Energy Imbalance Market New Report: Resource Operating Limits	RetrieveEIMResourceOperatingLimit_CMRIv1 RetrieveEIMResourceOperatingLimit_CMRIv1_DocAttach	Sep 9, 2019	Nov 13, 2019	3.9.1
EIM 2019	New	Tab: Real-Time New Report: Resource Operating Limits	RetrieveResourceOperatingLimit_CMRIv1 RetrieveResourceOperatingLimit_CMRIv1_DocAttach	Sep 9, 2019	Nov 13, 2019	3.9.1

OASIS

Project	Change Type	UI Change	API Service Name & Major Version, Artifacts	MAP Stage	Production Activation	Technical Specifications
EIM 2019	New	Tab: ENERGY New Report: Transmission Loss	ENE_TRANS_LOSS	Sep, 2019	Nov 13, 2019	5.1.9

CMRI Improvements

Project Info	Details/Date
<p>CMRI UI Upgrade & Performance Improvements</p>	<p>CAISO is planning CMRI UI Upgrade & Performance Improvements</p> <ul style="list-style-type: none"> • Performance Improvements <ul style="list-style-type: none"> • Technology/Infrastructure Upgrade • Data Model Normalization <ul style="list-style-type: none"> • Due to data model normalization there will be data migration effort from old model to new model. • Data migration process is being tested in Non-Production environment. Current Plan: <ul style="list-style-type: none"> • Complete the data migration and cut over to new UI and performance improvements. • After cutover, users will have access to all the data. • ISO will communicate CMRI performance improvements patch deployment time line. • Market Participant Testing prior to Production deployment. • NO API interface changes and NO functionality changes. • CAISO requests to use the latest supported version as mentioned in the Tech Specs for application programming interfaces (API)

Milestone Type	Milestone Name	Dates	Status
Map Stage	CMRI Improvements available in MAP Stage	Jun 10, 2019	✓
Production Activation	CMRI Performance Improvements	Sept 12, 2019	

Commitment Cost and Default Energy Bid Enhancements - Tariff filing approach (from draft tariff review on June 12 call)

Fall 2019 Implementation - CCDEBE Phase1 - will file with FERC by end of August 2019

- ✓ Commitment Cost Caps
- ✓ Reference Level Adjustments with changes adopted in LMPME
- ✓ Make Day Ahead Market process permanent
- ✓ Make D+2 Process permanent
- ✓ Use of indices clarification per LMPME
- ✓ Use of Monday Only in DAM and RTM per LMPME

Fall 2020 Implementation

- CCDEBE Phase 2 - tariff filing TBD
 - ✓ Increase commitment cost caps/decrease adder to commitment cost calculations
 - ✓ Adopt market power mitigation of commitment costs
- FERC Order No 831 - will file with FERC by end of August 2019
 - ✓ Increase of energy bid cap to \$2000/MWh
 - ✓ Cost verification of bids above \$1000/MWh (internal and resource specific system resources)
 - ✓ After the cost recovery
- Import Bid Cost Verification - tariff filing TBD
 - ✓ Delay stakeholder process to develop screens for import bids from non-resource specific system resources
 - ✓ Implement concurrent with Order No. 831 compliance
 - ✓ Consider changes to power balance constraint penalty prices and other scarcity prices due to increase in bid cap

Fall 2019 – Commitment Cost and Default Energy Bid Enhancements Ph1

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"> • Ex-ante cost adjustment requests • Reference Level Adjustments to default commitment cost bids (start-up and minimum load costs) and default energy bids • Use of indices clarification, and Monday Only in DAM and RTM, per LMPME • Conditionally Available Resources (CAR) <p>Impacted Systems:</p> <ul style="list-style-type: none"> • SIBR: Allow the submittal of Ex Ante cost adjustments. • CMRI: Provide additional source information for default bids. <p>The following temporary processes from Aliso Canyon are now made permanent in CCDEBE’s tariff filing :</p> <ol style="list-style-type: none"> 1. Produce advisory information on potential resource commitments in DAM via the existing two-day-ahead process 2. Publish natural gas prices indices when available 3. Supplier ability to recover actual marginal fuel procurement costs for DEBs and generated bids 4. Continue use of natural gas burn constraint in given areas of CAISO balancing authority <p>Submit requests through CIDI for manual consultation and ex-post default bid adjustments.</p>
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)

Fall 2019 – Commitment Cost and Default Energy Bid Enhancements Ph1

CCDEBE Phase1 tariff filing requests that FERC make permanent changes that were accepted on an interim basis in Aliso Canyon proceedings

- “First, the CAISO proposes to make permanent the tariff revisions to improve the accuracy of the gas commodity price indices the CAISO uses to calculate proxy costs, default energy bids, and generated bids used in the day-ahead market, by reflecting the most recent gas commodity information. As discussed above, the CAISO also proposes to modify these provisions to include the Monday-only index” and
- “Second, the CAISO proposes to make permanent the tariff revisions that provide suppliers with advisory information regarding their resources’ potential commitment in the day-ahead market that the CAISO produces through its existing two-day-ahead process”

Fall 2019 – Commitment Cost and Default Energy Bid Enhancements Ph1

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	Publish revised external BRS v1.1	Jan 22, 2019	✓
	Publish External BRS v1.2: Phase 1/Phase 2, clarifications	Mar 29, 2019	✓
	Publish External BRS v1.3: Reference Level Adjustments	Apr 05, 2019	✓
	Publish External BRS v1.4 for CCDEBE tariff traceability	Jul 19, 2019	✓
	Publish External BRS v1.5: implementation notes & clarifications (BRQ046, BRQ035/335), Generic Hub GPI update	Sep 3, 2019	✓
Config Guides	Config Guide	N/A	
Tech Spec	Publish Technical Specifications	May 17, 2019	✓
	Publish Technical Specification updates for CARs and Electric Pricing Hub weighting	Jun 28, 2019	✓
Tariff	File Tariff - CCDEBE Phase 1	Aug 30, 2019	✓
	Draft Tariff published	May 13, 2019	✓
	Tariff stakeholder walkthrough conference call	Jun 11, 2019	✓
BPMs	Post Draft BPM changes	Sep 26, 2019	
External Training	Deliver External Training	Oct 08, 2019	
Market Sim	Unstructured Market Sim Window	Oct 21, 2019 - Nov 04, 2019	
Production Activation	CCDEBE Phase 1	Dec 04, 2019	

* Project schedule shows risk in meeting current targets. Project team attempting to mitigate risk. Tariff filing will request a “no-later-than” Dec 11 effective date.

Fall 2019 – ESDER Phase 3a – Bid Dispatchable Option

Project Info	Details/Date
<p>Application Software Changes</p>	<p><u>Scope:</u> The ESDER 3a scope of the larger ESDER3 initiative will include two (2) demand response enhancements:</p> <ul style="list-style-type: none"> • New bid dispatchable options for demand response resources • Removal of single LSE requirement for PDR registrations & removal of default load adjustment (DLA) <p>Additionally, for ESDER2 Tariff Compliance, following is being implemented as part of this project</p> <ul style="list-style-type: none"> • Customer Load Baseline Submittal <p><u>Impacted Systems (Overview):</u></p> <p>Master File:</p> <ul style="list-style-type: none"> • RDTs for PDR registrations in MF will require selection of an effective Bid Dispatchable Option to be used for market optimization and dispatch <p>DRRS:</p> <ul style="list-style-type: none"> • PDR registrations will not require all service accounts to have the same LSE <p>SIBR:</p> <ul style="list-style-type: none"> • Will apply Net Benefit Test price criteria for PDR bids and reject those not meeting the applicable criteria • Will not allow Bid Dispatchable Options to be changed in SIBR <p>HASP/RTM:</p> <ul style="list-style-type: none"> • Will use effective Bid Dispatchable Option registered in MF (e.g., 5-min, 15-min or Hourly) for market optimization and dispatch instructions • Will broadcast new PDR energy schedules/awards and instructions to downstream applications <p>Settlements:</p> <ul style="list-style-type: none"> • Will remove the default load adjustment (DLA) application • Will provide Bid Cost Recovery for PDRs with 15-Minute Bids but not Hourly Bids <p>CMRI:</p> <ul style="list-style-type: none"> • Will include energy schedules and awards for PDRs with new Bid Dispatchable Options (Existing) <p>MRI-Settlements (ESDER2 Tariff Compliance):</p> <ul style="list-style-type: none"> • New BASE measurement type for monitoring calculated baseline data

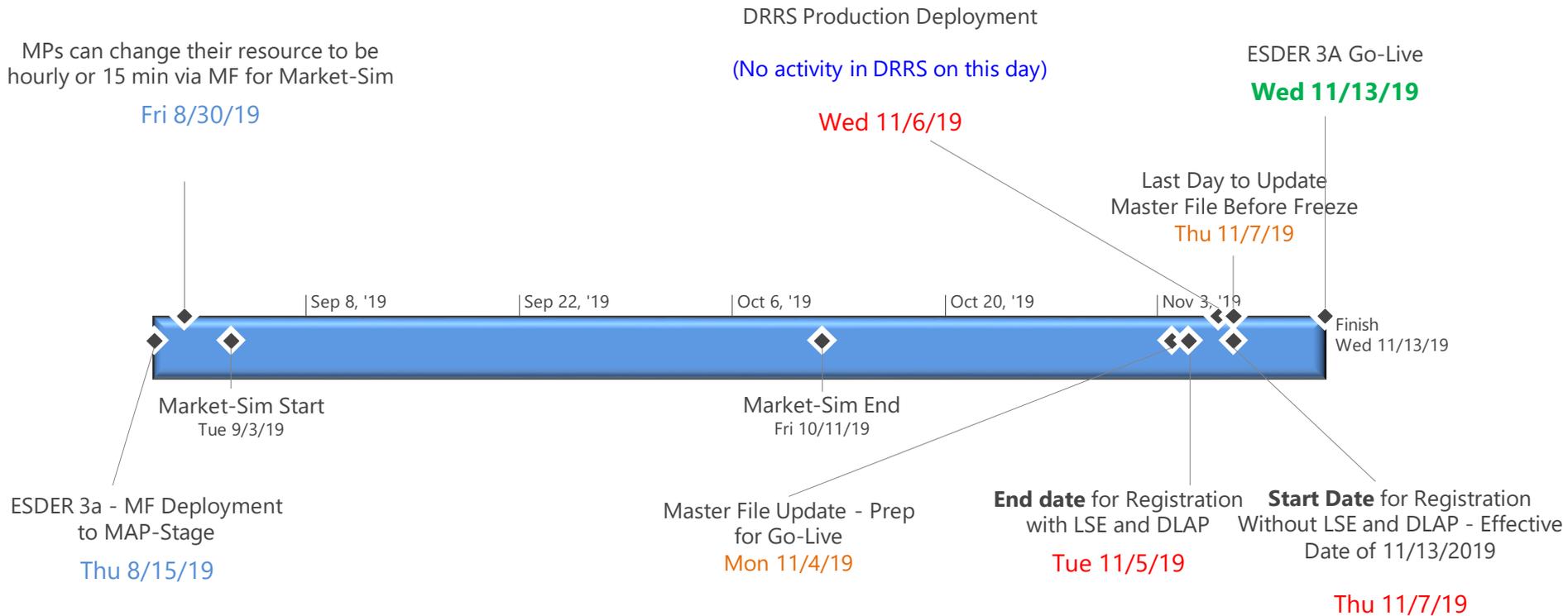
Fall 2019 – ESDER Phase 3a – Bid Dispatchable Option (cont.)

Project Info	Details/Date
BPM Changes	<ul style="list-style-type: none"> Market Instruments, Metering, and Demand Response (new BPM) Market Operations
Tariff Change	4.13 and 11.6

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Sep 05, 2018	✓
External BRS	Post External BRS v1.0	Feb 11, 2019	✓
	Post Revised External BRS v1.1	Feb 25, 2019	✓
	Post Revised External BRS v1.2	Mar 20, 2019	✓
	Post Revised External BRS v1.3	Jun 20, 2019	✓
	Post Revised External BRS v1.4	Jul 18, 2019	✓
Config Guides	Post Draft Config Guides	May 17, 2019	✓
Tech Spec	Publish Technical Specifications	May 17, 2019	✓
Tariff	Post Draft Tariff	May 28, 2019	✓
	File Tariff	Sept 3, 2019	✓
BPMs	Post Draft BPM (DR, MI & Metering) changes	Jul 30, 2019	✓
	Post draft BPM changes - Market Operations	Aug 20, 2019	✓
External Training	External training	Aug 26, 2019	✓
Market Sim	ESDER 3a	Sep 03, 2019 - Oct 11, 2019	
Production Activation	ESDER 3a - DRRS	Nov 06, 2019	
	ESDER 3a - IFM/RTN, Settlements, SIBR	Nov 13, 2019	

Fall 2019 – ESDER Phase 3a – Bid Dispatchable Option (cont.)

Proposed DRRS & MF Transition Timeline



Fall 2019 – RMR and CPM Enhancements

Project Info	Details/Date
Application Software Changes	<p><u>Scope:</u> RMR and CPM Enhancements will address the following policy and tariff amendment scope:</p> <ul style="list-style-type: none"> • Risk-of-Retirement tariff provisions will transition from CPM to RMR section • RMR units under the new tariff provisions shall: <ul style="list-style-type: none"> Have reliability capacity allocated by TAC Area (for PTOs, not LSEs), Flex RA credit shall be applied Receive Must-Offer Obligation (MOO) Subject to RAAIM Streamline RMR invoicing, settlement process through inclusion in ISO Settlement process <p><u>Impacted Systems (Overview):</u></p> <p>Master File:</p> <ul style="list-style-type: none"> • No impact. ISO will internally manage RMR resource status and vintage (e.g. RMR vs. RMRL). <p>CIRA:</p> <ul style="list-style-type: none"> • New features to both qualify (e.g. confirm EFC is defined) and allocate System/Local/Flex reliability capacity by TAC Area (for PTOs) for RMR units with new contract type: <ul style="list-style-type: none"> • Apply Flex RA credit by TAC Area (for PTOs) • Perform RMR Substitution • Support RMR Risk-of-Retirement • Like RA resources, RMR units under the new tariff will receive RAAIM status determination <p>SIBR</p> <ul style="list-style-type: none"> • Like RA resources, automatically generates cost-based energy bids for new contract type RMR units for un-submitted bid range below RMR contract capacity <ul style="list-style-type: none"> • Bids will reflect applicable GHG Compliance costs, SC charges, Major Maintenance Adder (MMA), and (if applicable) Opportunity Costs (OC); Note: MMA and OC are recovered through fixed cost payments (not market rents) and will be clawed-back during the ISO settlement process. • Removes self-schedule requirement for new contract type RMR units scheduled/dispatched in Day-Ahead Market <p>IFM/RTM:</p> <ul style="list-style-type: none"> • Unit Commitment, Economic Dispatch decisions will include applicable MMA and OC (no change from today) • Like RA resources, new contract type RMR units will have automatic RA Obligation (\$0/MWh bids in RUC)

Fall 2019 – RMR and CPM Enhancements (cont.)

Project Info	Details/Date
Application Software Changes	<p><u>Impacted Systems (Continued):</u></p> <p>IFM/RTM:</p> <ul style="list-style-type: none"> • Unit Commitment, Economic Dispatch decisions will include applicable MMA and OC (no change from today) • Like RA resources, new contract type RMR units will have automatic RA Obligation (\$0/MWh bids in RUC) <p>Settlements:</p> <ul style="list-style-type: none"> • RMR units under new contract type will receive: <ul style="list-style-type: none"> • RMR under new tariff provisions will settle through the ISO Settlements calendar; • Legacy RMR (RMRL) will continue to receive payment through the RMR invoicing process • Monthly RMR capacity payment (by resource) and cost allocation (by PTO) • RAIM settlement/allocation • Bid Cost Recovery (does not include MMA or OC) • Clawback of fixed MMA and OC costs (if applicable) <p>CPM tariff revisions will be addressed during the CPM Soft Offer Cap policy initiative.</p>
BPM Changes	Reliability Requirements, Generator Management, Market Operations, Market Instruments, Settlements and Billing
Tariff Change	11.13, 31.2.2, 34.1, 40.9, 41, 43, 43A, Appendix G

Fall 2019 – RMR and CPM Enhancements (cont.)

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board of Governors Approval	Mar 28, 2019	✓
External BRS	Post External BRS	Apr 01, 2019	✓
	Post Updated External BRS v1.1	Jul 26, 2019	✓
Config Guides	Publish Config Guide	Jun 03, 2019	✓
Tech Spec	Publish Technical Specifications	N/A	
Tariff	File Tariff w/ FERC	Apr 23, 2019	✓
	Receive FERC order (Deficiency Letter)	Jul 19, 2019	✓
	Refiled with FERC	Jul 26, 2019	✓
BPMs	Post Draft BPM changes <ul style="list-style-type: none"> • Settlements and Billing – PRR1184 • Generator Management • Reliability Requirements • Market Instruments • Market Operations 	Aug 30, 2019 target	
External Training	Knowledge Transfer Article	Aug 30, 2019	✓
Market Sim	RMR/CPM	Sep 03, 2019 - Oct 11, 2019	
Production Activation	RMR/CPM Deployment	Nov 13, 2019	
	RMR and CPM Effective Date	Jan 01, 2020	

Fall 2019 – Local Market Power Mitigation Enhancements

Project Info	Details/Date
Application Software Changes	<p>Scope: Prevent Flow reversal, Limits transfer, DEB for Hydro, Reference level adjustment process, Gas price Indices</p> <p>Impacted Systems:</p> <p>RTM: Prevent flow reversal Eliminate rule mitigate in FMM carry to RTD Eliminate rule mitigate for balance of hour for FMM, balance 15 minute for RTD Use current market competitive LMP for mitigation Add a nominal parameter to mitigated bids Mitigated bid = MAX (DEB, Competitive LMP + \$0.xx parameter)</p> <p>RTM: Limit transfers to limit Economic Displacement Optional rule for EIM BAA Limit transfers to the greater of exports in MPM and flexible ramping requirements Export Limit = MAX [ExportsBase, ExportsMPM, $\Sigma FRUMPMAward$] The exporting BAA will receive congestion rents created by this proposed rule</p> <p>OASIS: Publish EIM transfer limit</p> <p>CMRI: Display new Hydro DEB type</p> <p>Master File: Option to limit transfer per a defined rule Manage Hydro DEB eligibility at resource level New field to select and rank hydro DEB option Store resource's maximum storage horizon Identify default trading hubs for hydro resources, requests changes to additional hubs Ability to view parameters and ranking of approved hydro DEBs</p>
BPM Changes	Market Operations, Market Instruments
Tariff Change	Section 29.39, 31.2.1, 39.7

Fall 2019 – Local Market Power Mitigation Enhancements (cont.)

Milestone Type	Milestone Name	Dates	Status
Board Approval	Board of Governors Approval	Mar 28, 2019	✓
External BRS	Post External BRS	Apr 01, 2019	✓
Config Guides	Post Draft Config Guides	N/A	
Tech Spec	Publish Technical Specifications – MF v5.0, CMRI v3.9.0	May 17, 2019	✓
	Publish Technical Specification updates for CARs and Electric Pricing Hub weighting – MF v5.1	Jun 28, 2019	✓
Tariff	File Tariff	Jul 02, 2019	✓
BPMs	Post Draft BPM changes	Sep 05, 2019	
External Training	Deliver External Training	Aug 29, 2019	✓
Market Sim	Market Simulation Testing	Sep 03, 2019 - Oct 11, 2019	
Production Activation	LMPM - Enhancements	Nov 13, 2019	

* Project schedule shows risk in meeting current targets. Tariff filing requested a “no-later-than” Dec 4 effective date.

Fall 2019 – Energy Imbalance Market Enhancements 2019

Project Info	Details/Date
Application Software Changes	<p>Scope: Implement 21 EIM enhancements requested by EIM entities through CIDI System</p> <p>Impacted Systems: BAAOP: Add displays for BAA overview, Unit deviations, Load Bias, transfer limits, contingency flag, timestamps, and other identified items. Enhance sorting and layouts ability. Enhance alarm ability for market thresholds. BSAP: Enhance capability for Base schedule modification, Add aggregated BS deviation in API. OASIS or CMRI: Display ROC limits Display 5-min market transmission Loss RTM: prevent ETSR swing using explicit triggers. ADS: Publish current DOP in the MSG transition period. Settlement: Publish data for UFE shadow calculation; Settle EIM Resource Deviation within Regulation/ABC range as instructed regulation energy. CMRI: Publish resource limit values</p>
BPM Changes	Market Instruments, Energy Imbalance Market

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Milestone: Post External BRS	Feb 05, 2019	✓
	Milestone: Post External BRS Revisions 1.4	Aug 12, 2019	✓
Config Guides	Publish Config Guides	May 17, 2019	✓
Tech Spec	Create ISO Interface Spec (Tech spec) – OASIS v5.1.9	Jul 19, 2019	✓
	Revised ISO Interface Spec (Tech spec) – BSAP v1.7	Jul 03, 2019	✓
	ISO Interface Spec (Tech spec) – BSAP v1.6, CMRI v3.9.0	May 17, 2019	✓
Tariff	File Tariff	N/A	
BPMs	Post Draft BPM changes	Aug 30, 2019	✓
External Training	External Training Webinar	Aug 26, 2019	
Market Sim	Market Sim Window	Sep 03, 2019 - Oct 11, 2019	
Production Activation	EIM Enhancements 2019	Nov 13, 2019	

Fall 2019 – FERC 841 Energy Storage Resources

Project Info	Details/Date
Application Software Changes	<p>Scope: FERC issued Order 841 to remove the barriers to the participation of electric storage resources in the capacity, energy and ancillary service markets operated by RTOs and ISOs.</p> <p>CAISO will achieve compliance with Order 841 through implementation of two (2) specific scope items:</p> <ul style="list-style-type: none"> • Reduce the minimum capacity for participating Generators to 100kW for storage resources • Remove Transmission Access Charge (TAC) for Pumped-Storage Hydro Units <p>Impacted Systems:</p> <p>RIMS: No changes to system. Registration process change to allow minimum rated capacity of 100kW for storage resources</p> <p>Settlements: Revision to charge codes to remove TAC for Pumped-Storage Hydro Units</p>
BPM Changes	Market Operations, Settlements and Billing
Tariff Change	4.6.3.2 – Exemption for Generating Units of Less Than One (1) MW 26.1 – Transmission Rates and Charges Appendix A – Definition Change for Participating Generator

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Milestone: Post External BRS	Jun 20, 2019	✓
Config Guides	Milestone: Post Config Guide	Jun 03, 2019	✓
Tech Spec	N/A: Publish Technical Specifications	Aug 13, 2019	✓
Tariff	File Tariff	N/A	
BPMs	Draft BPM changes - Settlements - Market Operations and Gen Management	Aug 21, 2019 Aug 30, 2019	✓
External Training	External training	N/A	
Market Sim	Market Sim Window	Sep 03, 2019 - Oct 11, 2019	
Production Activation	FERC 841 - NGR Model	Nov 13, 2019	

Fall 2019 – Real-Time Market Neutrality Settlement

Project Info	Details/Date
Application Software Changes	Settlement: modify CC6477, CC64770 <ul style="list-style-type: none"> Remove EIM transfer adjustment amount Credit the GHG cost for non-CA transfers in EIM transfer financial value calculation Use 5-minute ETSR After-The-Fact tags submitted by EIM BAA
BPM Changes	Settlements & Billing
Tariff Change	11.5.4.1 Real Time Imbalance Energy Offset

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	Jul 25, 2019	✓
External BRS	Post External BRS	Jul 08, 2019	✓
	Post External BRS (Updated)	Aug 07, 2019	✓
Config Guides	Publish Config Guide	Jul 31, 2019	✓
Tech Spec	Publish Technical Specifications	N/A	
Tariff	File Tariff w/FERC	Jul 30, 2019	✓
BPMs	Post Draft BPM changes	Aug 26, 2019	✓
External Training	Deliver External Training	Aug 27, 2019	
Market Sim	Market Sim Window	Sep 03, 2019 - Oct 11, 2019	
Production Activation	RT Market Neutrality Settlement	Nov 13, 2019	

2020 Spring Release

Spring 2020 – EIM integrations for SCL and SRP

Project Info	Details/Date
Application Software Changes	Implementation of SCL and SRP as EIM Entities
BPM Changes	EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from SCL and SRP.
Market Simulation	December 2019 – January 2020
Parallel Operations	February 2020 – March 2020

Milestone Type	Milestone Name	Dates	Status
Market Sim	Market Sim Window	December 2019 – January 2020	
Parallel Operations	Parallel Operations	February 2020 – March 2020	
Tariff	File Readiness Certification	March 2020	
Production Activation	EIM – SCL and SRP	April 2020	

2020 Independent

2020 – 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 • The query tool will provide 30 days of historical data • Various user interface enhancements adding content per Operation's request • ADS B2B services changes - TBD.
BPM Changes	<ul style="list-style-type: none"> • Market Instruments • Market Operations

Milestone Type	Milestone Name	Dates	Status
Board Approval	Obtain Board of Governors Approval	N/A	
External BRS	Post External BRS	Aug 06, 2018	✓
ADS Update	ADS Update Meeting	Aug 15, 2018	✓
Config Guides	Design review - BPM and Tariff SMEs	TBD	
Tech Spec	Publish Technical Specifications	TBD	
Tariff	File Tariff	TBD	
BPMs	Post Draft BPM changes	TBD	
Market Sim	Market Sim Window	Q3 2020	
Production Activation	ADS Replacement	Q3 2020	
Production	ADS Parallel Operations	Q3 2020	
Decommission	Old ADS Decommission	TBD	

2020 Fall Release

Fall 2020 – Commitment Cost and Default Energy Bid Enhancements Ph2

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"> • Introduces market power mitigation (MPM) measures for commitment costs. • 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 <p>Impacted Systems:</p> <ul style="list-style-type: none"> • SIBR: Incorporate negotiated default commitment bids. Increase commitment cost caps. Allow for hourly submittal of minimum load bids into day-ahead market. Increase energy bid caps, incorporate soft energy bid cap. • 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. • 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 requests for manual consultation and ex-post default bid adjustments.
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)

Fall 2020 – Import Bid Cost Verification

Project Info	Details/Date
Market notice May 16, 2019	<p>The objective of the Import Bid Cost Verification initiative is to ensure energy prices continue to reflect the marginal cost of supply when those prices exceed \$1,000/MWh, and to ensure intertie offer rules are consistent with ISO's internal bidding rules by developing reasonable cost-verification measures for intertie offers above \$1,000/MWh.</p> <p>In 2016, the Federal Energy Regulatory Commission (FERC) required Independent System Operators (ISO)/ Regional Transmission Organizations (RTOs) to raise energy bid-caps from \$1,000/MWh to \$2,000/MWh, and ensure internal supply offers above \$1,000/MWh are cost-justified. FERC did not require the same treatment for suppliers that submit intertie offers, but it was open to individual ISO/RTOs developing and justifying their own requirements for intertie offers above \$1,000/MWh. This initiative is therefore intended to develop reasonable cost-verification measures for intertie offers above \$1,000/MWh</p>

Fall 2020 – ESDER Phase 3b – Load Shift Product

Project Info	Details/Date
Application Software Changes	<p><u>Scope:</u></p> <p>The ESDER 3b initiative will include two (2) demand response enhancements:</p> <ul style="list-style-type: none">• Addition of a Load Shift Product wherein demand response resources with behind the meter (BTM) storage devices can participate in both load consumption and load curtailment.• Enable sub-metered electric vehicles supply equipment (EVSE) to participate in load curtailment <p><u>Impacted Systems (Overview):</u></p> <p>Master File:</p> <ul style="list-style-type: none">• Registration of new PDR Resource Types and business rules for PDRs with BTM storage devices and wanting to participate in both Load Curtailment and Consumption• Two (2) Resource IDs will be assigned to the same Resource to allow Consumption versus Curtailment participation (PDR-LSR) <p>DRRS:</p> <ul style="list-style-type: none">• Allow two resource IDs to be selected for registrations with LSR baseline methods• New baseline methods for PDR-LSRs and EVSEs• New attribute for locations to indicate BTM device <p>CIRA:</p> <ul style="list-style-type: none">• Will prevent the request of NQC for PDR-LSR Consumption resources

Fall 2020 – Dispatch Operating Target Tariff Clarification

Project Info	Details/Date
Application Software Changes	<p>Scope: Allow Energy Intermittent Resources (EIRs) to automate their response to operational instructions that require the resource not to exceed their `</p> <p>Impacted Systems: RTM: Operator can select EIR resources, system to send Operating instruction Flag to ADS ADS: Receive Operating instruction flag for EIRs. Broadcast message to EIRs operator.</p>
BPM Changes	Market Instruments Market Operations
Tariff Change	Changes tariff language from “Operating Order” to “Operating Instruction” in multiple sections.

Fall 2020 – Intertie Deviation Settlement

Project Info	Details/Date
Application Software Changes	<p>Scope: Implement a new Under/Over Delivery Charge for intertie deviations from Market Schedule and After-The-Fact (ATF) E-Tag, to replace Decline charge</p> <p>Impacted Systems: Settlements</p> <ul style="list-style-type: none"> • Calculate FMM binding intertie award, exclude Curtailment, calculate under/over delivery quantity as deviation of schedule and ATF E-Tag, Charge under/over delivery Charge at 50% of RTD LMP. • Remove the decline charge calculation and Decline Threshold • Allocate Over/Under delivery charge to measured demand
BPM Changes	Settlements and Billing
Tariff Change	Section 11.31

2021 Spring Release

Spring 2021 – EIM integrations for PNM, LADWP, TID and NWE

Project Info	Details/Date
Application Software Changes	Implementation of PNM, LADWP, TID, and NWE as EIM Entities
BPM Changes	EIM BPM will be updated if needed to reflect new modeling scenarios identified during implementation and feedback from PNM, LADWP, TID, and NWE.
Market Simulation	December 2020 – January 2021
Parallel Operations	February 2021 – March 2021

Milestone Type	Milestone Name	Dates	Status
Market Sim	Market Sim Window	December 2020 – January 2021	
Parallel Operations	Parallel Operations	February 2021 – March 2021	
Tariff	File Readiness Certification	March 2021	
Production Activation	EIM – PNM, LADWP, TID, and NWE	April 2021	

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

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

Remaining 2019 MPPF Schedule

- October 23 – Webinar only
- December 11 – In person/webinar

Reference ISO public calendar for participation details.

Agenda topic suggestions:

- Submit through CIDI
 - Select the *Market Performance and Planning Forum* category
- Send email to isostakeholderaffairs@caiso.com.