



# **Draft 2021 Policy Initiatives Catalog**

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# 1 Introduction

This *Draft Policy Initiatives Catalog* documents current, potential, planned and ongoing policy initiatives to develop enhancements to the California ISO (CAISO) markets or to related requirements for policy. These are enhancements requiring a stakeholder process and typically result in CAISO tariff changes. This catalog does not list potential process improvements or administrative changes.<sup>1</sup>

This catalog is organized into the following sections:

- Initiative Categorization
- Changes Since Previous Version
- Initiatives Completed Since Previous Catalog
- Initiatives Currently Underway and Planned
- Discretionary Initiatives
  - Energy and Ancillary Services Markets
  - Congestion Revenue Rights
  - Resource Adequacy
  - Interconnection
- Proposed Deletions

The CAISO updates this catalog twice a year in February and August. Stakeholders may submit new initiative requests through the policy initiatives submission template posted on the *Annual Policy Initiatives* website.<sup>2</sup> Submissions will be collected and considered for its respective catalog update until the first Tuesday of January and July. Following the deadline of submissions, the process for updating the catalog is as follows:

1. Stakeholder submissions are posted
2. CAISO publishes draft policy initiatives catalog
3. Stakeholders submit comments on draft policy initiatives catalog
4. CAISO publishes revised draft policy initiatives catalog
5. Stakeholders submit comments on revised draft policy initiatives catalog
6. CAISO publishes final policy initiatives catalog
7. Stakeholders submit comments on final policy initiatives catalog

<sup>1</sup> Such requests should be made through a CAISO customer service representative or account manager.

<sup>2</sup> <http://www.aiso.com/informed/Pages/StakeholderProcesses/AnnualPolicyInitiativesRoadmapProcess.aspx>

The *Policy Initiatives Catalog* is a separate document used in the development process for the *Annual Policy Initiatives Roadmap*.

## 2 Initiative Categorization

This catalog sorts initiatives into various categories using letter codes. These codes are found next to the initiative's title. An initiative's categorization determines priority for its inclusion in the roadmap.

The codes below are listed in priority of the CAISO:

- I – In-progress initiatives;
- F – FERC-mandated initiatives;
- C – CAISO Committed initiatives; and
- D – Discretionary initiatives

FERC mandated initiatives are initiatives the CAISO must complete to comply with FERC orders. CAISO committed initiatives, which the CAISO tries to use sparingly, are initiatives that address very significant reliability or market efficiency issues. They are also initiatives the CAISO previously committed to during a regulatory proceeding or has already stated that it would undertake to stakeholders, the CAISO Board of Governors, EIM Governing Body, or FERC. Discretionary initiatives are the remainder of initiatives suggested by either the CAISO or stakeholders for consideration in the roadmap. Discretionary initiatives are prioritized by the CAISO with stakeholder input during the development of the *Annual Policy Initiatives Roadmap*.

The *in progress* code may be combined with any of the other three codes. This indicates that a policy initiative has begun and a webpage likely exists on the CAISO website.<sup>3</sup>

In addition to the above codes, this document also includes codes for policy initiatives that may affect the Energy Imbalance Market (EIM). These codes describe the role of the EIM Governing Body in approving the policy resulting from the initiative.<sup>4</sup>

The EIM Governing Body categorizes initiatives into one of the following:

- 1 – EIM Governing Body's primary authority
- 2 – EIM Governing Body's advisory role
- 3 – EIM Governing Body's hybrid- EIM driven
- 4 – EIM Governing Body's hybrid- not EIM driven

<sup>3</sup> <http://www.aiso.com/informed/Pages/StakeholderProcesses/Default.aspx>

<sup>4</sup> <https://www.westerneim.com/Documents/GuidanceforHandlingPolicyInitiatives-EIMGoverningBody.pdf>

A category 1 classification is any policy initiative that involves market rules changes that fall entirely within the EIM governing body's primary authority.<sup>5</sup> A category 2 classification is any policy initiative proposing changes to rules that are within the EIM Governing Body's advisory authority.<sup>6</sup> A category 3 classification is when the primary driver for the initiative is EIM and the policy initiative is a hybrid in that it has both a component that would fall within the EIM Governing Body's primary authority and a component that does not.<sup>7</sup> A category 4 classification is when the primary driver for the initiative is not EIM and the policy initiative is a hybrid in that it has both a component that falls within the EIM Governing Body's primary authority and a component that does not.<sup>8</sup>

Stakeholders should consider the EIM classification codes listed in this document as preliminary. Classifications can be changed anytime during the stakeholder process of an initiative. An EIM classification generally becomes final after the policy paper titled, "draft final proposal" is published. More information regarding this process is located in the *Guidance for Handling Policy Initiatives within the Decisional Authority or Advisory Role of the EIM Governing Body*.<sup>9</sup>

### 3 Changes Since Previous Version

The CAISO made the following changes to the catalog published on September 5, 2019:

1. Updated the Introduction.
2. Updated the Changes Since Previous Version section.
3. Removed initiatives in Initiatives Completed Since Previous Catalog and updated section description.
4. Updated Initiatives Currently Underway and Planned description.
5. Added Commitment Cost Enhancements Tariff Clarifications (I, C) to Section 5, Initiatives Currently Underway and Planned.
6. Updated description of Order 831 - Import Bidding and Market Parameters (I, C, 2) and changed name.
7. Added Variable Operations and Maintenance Cost Review (I, C, 2) to Section 5, Initiatives Currently Underway and Planned.
8. Added Maximum Import Capability Stabilization and Multi-Year Allocation (I, C) to Section 5, Initiatives Currently Underway and Planned.
9. Added Setting Test-Based Effective Flexible Capacity (EFC) Values for Proxy Demand Resources (C) to Section 5, Initiatives Currently Underway and Planned.
10. Updated System Market Power Mitigation (I, C, 2) description.
11. Updated Day-Ahead Market Enhancements (I, C, 2) description.
12. Updated Extend Day-Ahead Market to EIM Entities (I, C, 1) description.
13. Updated EIM Governance Review Phase 2 (I, C, 1) description.
14. Added Flexible Ramping Product Refinements (I, C, 2) to Section 5, Initiatives Currently Underway and Planned.

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<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> <https://www.westerneim.com/Documents/GuidanceforHandlingPolicyInitiatives-EIMGoverningBody.pdf>



15. Added Real-Time Settlement Review (C, 2) to Section 5, Initiatives Currently Underway and Planned.
16. Updated Real-Time Market and EIM Refinements (C, 2) description.
17. Moved Dispatch Enhancements (C, 2) to Section 5, Initiatives Currently Underway and Planned.
18. Moved Frequency Response Product (F) to Section 5, Initiatives Currently Underway and Planned.
19. Moved Joint Owned Unit Model (D, 2) to Section 5, Initiatives Currently Underway and Planned.
20. Added Ancillary Service Deliverability (C) to Section 5, Initiatives Currently Underway and Planned.
21. Moved Transmission-Distribution Interface (D) to Section 5, Initiatives Currently Underway and Planned
22. Updated Section 7, Proposed Deletions and added 2020 Interconnection Process Enhancements.

## 4 Initiatives Completed Since Previous Catalog

This section lists the initiatives where the policy development has been completed since the CAISO published the 2020 Policy Initiatives Catalog. For the purpose of this catalog, policy development is considered completed when the stakeholder process is finished and the CAISO Board of Governors approved policy's proposal. Initiatives placed in this section may still be currently underway, but are anticipated to be approved by the CAISO Board of Governors by the end of the year.

For additional information on initiatives underway, please refer to the initiative's web page.<sup>10</sup>

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*The August catalog update will reflect the completed initiatives for 2020.*

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## 5 Initiatives Currently Underway and Planned

This section summarizes policy initiatives that are currently or will soon begin a stakeholder process. It also summarizes initiatives the CAISO already committed to during the development of the 2020 *Policy Initiatives Roadmap*.

### 5.1 Capacity Procurement Mechanism (CPM) Soft Offer Cap (I, C, 2)

This initiative is reviewing the soft offer cap for the CPM competitive solicitation process. The CPM Soft Offer Cap initiative is also reviewing appropriate compensation measures for 12-month CPM designations.

<sup>10</sup> <http://www.aiso.com/informed/Pages/StakeholderProcesses/Default.aspx>

## 5.2 Commitment Cost Enhancements Tariff Clarifications (I, C)

This initiative clarifies rules around conditionally available resources, that these resources are generally subject to RAIM, and that resources may be both use limited and conditionally available. This initiative also develops the definition for run of river resources.

## 5.3 Energy Storage and Distributed Energy Resources Phase 4 (I, C, 2)

This initiative is exploring refinements to the distributed energy resource and storage participation models and lowering integration barriers for these resources, e.g. how to optimally leverage resource design attributes that support grid reliability and maximize their value. To continuously improve and enhance participation models for both storage and distributed energy resources, the CAISO will explore the following topics in this initiative:

- Adding state of charge biddable parameters to the non-generator resource model;
- Applying market power mitigation to energy storage resources;
- Streamlining interconnection agreements for non-generator resource participants
- Establishing a maximum daily run time parameter to better reflect demand response resource operational characteristics;
- Vetting qualification and operational processes for variable-output demand response resources

## 5.4 Order 831 - Import Bidding and Market Parameters (I, C, 2)

This initiative examines cost verification measures for intertie offers above \$1,000/MWh and explores alternative methodologies for setting market prices when the CAISO market must relax constraints under a \$2,000/MWh bid cap.

## 5.5 Hybrid Resources (I, D, 2)

As generation developers become increasingly interested in pairing energy storage with existing or proposed generation, this initiative will explore how “hybrid” generation resources will be registered and configured to operate within the CAISO market, and will resolve the operational and forecasting challenges hybrid resource configurations present. The CAISO will evaluate the need for potential modifications in the following areas to further enable hybrid resource participation: metering and telemetry, forecasting, interconnection requirements, markets and systems, ancillary services, deliverability, and resource adequacy.

## 5.6 Variable Operations and Maintenance Cost Review (I, C, 2)

In this initiative, the CAISO is reviewing the operations and maintenance (O&M) cost values used in the CAISO’s estimates of generating resources’ costs. The CAISO is proposing improvements to the existing O&M cost recovery mechanism by updating definitions for O&M cost components, changing the composition of the variable operations and maintenance (VOM) adder, and expanding the major maintenance adder (MMA) process with a new default maintenance adder. The VOM adder and MMA are used as a component of the calculation of proxy energy, minimum load, and start-up costs which the CAISO uses in local market power mitigation.

## 5.7 Maximum Import Capability Stabilization and Multi-Year Allocation (I, C)

The purpose of this initiative is twofold. In the short-term, the purpose is to update the methodology used in the calculation of the simultaneous Maximum Import Capability (MIC) to achieve a greater stability of MIC overall allocations. In the long-term, the purpose is to update the annual nature of the MIC allocation process into a multi-year allocation process to accomplish numerous important objectives, the primary of which is the facilitation of long-term procurement of import resources and multi-year system Resource Adequacy (RA) requirements, should they be established in the future.

## 5.8 Flexible Ramping Product Refinements (I, C, 2)

This initiative addresses the flexible ramping product issues identified in the CAISO Energy Markets Price Performance Report<sup>11</sup> published on September 23, 2019. The issues include: proxy demand response eligibility, ramp management between FMM and RTD, minimum requirement for a balancing authority area, and deliverability enhancements.

## 5.9 Setting Test-Based Effective Flexible Capacity (EFC) Values for Proxy Demand Resources (C)

This initiative was added to the catalog by the CAISO in this update. When the CAISO implemented the FRACMOO initiative there were no PDRs registered with the CAISO. Because of the absence of PDRs, the CAISO did not develop the test procedures called for under section 40.10.4.1(c) which provides that a PDR's effective flexible capacity (EFC) be "based on the resource's actual MWs of load modification in response to a dispatch by the CAISO during a test event." When the first PDRs came into the CAISO system, the CAISO still had not developed the test procedures. Without consideration of section 40.10.4.1(c), the CAISO erroneously began calculating PDR EFCs using the general formula in section 40.10.4.1(a). This initiative will propose a resolution to the discrepancy between the tariff and business practices for setting an Effective Flexible Capacity (EFC) value for PDR.

## 5.10 EIM Base Schedule Submission Deadline (C, 1)

This initiative was added to the catalog by the CAISO in July 2018. Current financially binding base schedules are finalized by the EIM entity Scheduling Coordinator at T-40. The final hourly resource sufficiency evaluation is performed and EIM transfers are frozen in the event the tests fail. This initiative would examine moving the final base schedule submissions closer to the operating hour, for example T-30. Assuming these changes, the CAISO may explore moving the fifteen-minute market's optimization start window to match the new base schedule submission deadline to ensure a more accurate resource sufficiency evaluation point.

## 5.11 System Market Power Mitigation (I, C, 2)

CAISO analyses showed that there may be periods when the energy market may be uncompetitive at a system level within the CAISO balancing authority area. Through extensive discussions with stakeholders, the Market Surveillance Committee, and the Board of Governors, the CAISO determined that it should begin policy development on system-level market power mitigation design measures. This initiative will design a system-level market power mitigation

<sup>11</sup> The report is available at <http://www.caiso.com/Documents/FinalReport-PricePerformanceAnalysis.pdf>

process in two phases. In the first phase, the CAISO plans to develop policy for the CAISO balancing area in the Real-Time Market. In the second phase, the CAISO plans to develop policy for the wider Energy Imbalance Market footprint and expand the mitigation design to the Day-Ahead Market.

### 5.12 Congestion Revenue Rights Auction Efficiency Track 2 (D)

The congestion revenue rights (CRR) auction revenues collected by the CAISO are persistently less than the payments that the CAISO pays to auctioned CRR holders, indicating an issue with the efficiency of the CRR auction. An efficient CRR auction should lead to auction revenues that approach the auction payments. As discussed in the Department of Market Monitoring's 2015 Annual Report, since 2012 congestion revenue rights auction revenues that are allocated to load serving entities were on average \$130 million less than the congestion payments received by entities purchasing these congestion revenue rights. Most of these congestion payments are paid to financial entities that purchase congestion revenue rights but are not engaged in serving any load or managing any generation in the CAISO market. Department of Market Monitoring recommended reassessing the component of standard electricity market design under which CAISOs auction off excess transmission capacity remaining after allocating congestion revenue rights to load serving entities.

This track will be considered after the CAISO analyzes the effectiveness of Track 1A and 1B measures and determines if any issues remain.

### 5.13 Resource Adequacy Enhancements (I, C)

The rapid transformation of the resource fleet to cleaner and more variable energy resources is exposing shortcomings in the current resource adequacy framework. In collaboration with the CPUC and stakeholders, the CAISO is proposing reforms to the CAISO's resource adequacy rules, requirements, and processes to ensure the future reliability and operability of the grid. With stakeholders, the CAISO is exploring the following topics:

- Enhancements needed to the flexible resource adequacy capacity construct to ensure there is sufficient flexible resource adequacy capacity procured and made available to the CAISO to meet the operational needs of the transforming grid;
- Local assessments with availability limited resources;
- Must Offer obligation (MOO) and bid insertion modifications;
- Modifications of the resource adequacy availability incentive mechanism (RAAIM);
- Resource adequacy validation tools and portfolio analysis;
- Capacity procurement mechanism (CPM) enhancements;
- Operationalizing slow demand response resources for local needs; and
- Resource Adequacy capacity valuation rules.

### 5.14 Day-Ahead Market Enhancements (I, C, 2)

This initiative includes a redesign of the day-ahead market and introduces new day-ahead market products. The objective of this initiative is to efficiently schedule resources to: 1) meet the load forecast and accommodate the uncertainty of real-time net load and its rate of variability; 2) appropriately compensate resources that provide flexible capacity to meet this net load uncertainty and variability; 3) optimally clear and price energy and other market products in the day-ahead market, including incorporating actions into the market that system operators currently take outside of the market; and 4) respect transmission constraints so that resource schedules are deliverable. The CAISO is considering a design that introduces a new energy schedule, termed “reliability energy”, which replaces the existing residual unit commitment process and ensures efficient commitment and scheduling of resources to meet the CAISO net load forecast and cleared bid-in demand. Additionally, the design introduces a new uncertainty product, termed “imbalance reserves”, to ensure the day-ahead market schedules sufficient real-time dispatch capability to meet net load imbalances that materialize between the day-ahead and fifteen-minute markets.

### 5.15 Extend Day-Ahead Market to EIM Entities (I, C, 1<sup>12</sup>)

This initiative will enable EIM entities to participate in the day-ahead market in a framework similar to the existing EIM approach for the real-time market, rather than requiring full integration into the CAISO balancing area as participating transmission owners (PTO). The extended day-ahead market (EDAM) will improve market efficiency and more effectively integrate renewable resources by optimizing day-ahead unit commitment and scheduling across a larger footprint.

The same principles of the Western EIM will be maintained: voluntary participation, low-entry cost, no exit fees, and balancing authorities retain operational control over their resources and transmission. Participation in EDAM will be optional for EIM entities such that EIM entities may still elect to only participate in the CAISO’s real-time market. However, participating in the EDAM requires participation in the EIM.

EIM entities that elect to participate in the day-ahead market will retain flexibility and independence, including retaining their balancing authority and planning functions. The EDAM approach will bring many of the benefits of day-ahead market participation, notably, increased ability to integrate renewable resources and optimized unit commitment over a larger footprint. Resource adequacy will be the responsibility of each EIM entity and their state and local regulatory authority, although a resource sufficiency evaluation similar to the EIM will have to be considered for the day-ahead market.

The EDAM will not change state or local control over integrated resource planning. The decisions regarding forward procurement of capacity for resource adequacy will remain with the utility in coordination with their state and local regulatory authorities. Likewise, transmission planning and investment decisions remain with each balancing authority area, state and local regulatory authority.

<sup>12</sup> Day-ahead market rules are not currently within the purview of EIM Governing Body’s primary or advisory role. Because the EDAM is fundamentally about expanding the existing EIM to include an opportunity for day-ahead market participation, CAISO will seek one-time joint approval from the EIM Governing Body and the CAISO Board of Governors for the proposed EDAM market rules.

As discussed below, the EDAM initiative covers a variety of market design and policy decisions. It should be noted, EDAM design changes may result in corresponding changes to the EIM design to maintain consistency between the day-ahead and real-time markets.

The primary market design and policy considerations include:

### 5.15.1 Transmission Provision

In EIM, transmission is made available to support energy transfers through contributions by interchange rights holders or available transmission capacity provided by EIM entities. This transmission supports energy transfers between balancing authority areas at no transmission usage rate. Interchange rights holders have procured transmission and on a voluntary basis have chosen to allow the transmission to be used for transfers. Available transmission capacity is residual transmission, i.e. unused after the T-20 tagging deadline, with EIM transfers as the lowest priority use of the transmission. That is, if in real-time the transmission is used bilaterally, the market will re-dispatch participating resources to ensure EIM transfers stay within the unused portion. EDAM will require a different approach than EIM. Since transmission customers can use transmission up until just prior to the operating hour, EDAM cannot assume transmission will be unused. As a result, this initiative will develop rules and approaches for making transmission available in the day-ahead timeframe to support transfers between balancing authority areas.

### 5.15.2 Distribution of Congestion Rents

Congestion occurs in the day-ahead market when generation that is economic cannot be fully dispatched to serve load because it is located in a transmission constrained area. As a result, load pays a higher locational marginal price (LMP) than what the generation is paid. The CAISO market's financial settlement must allocate this over-collection of market revenue (i.e. congestion rent) to market participants. In the current CAISO day-ahead market, congestion revenue rights (CRRs) are the primary mechanism to distribute congestion revenue. This initiative will evaluate approaches to distribute day-ahead market congestion rents collected in balancing authority areas other than the CAISO.

### 5.15.3 Resource sufficiency evaluation

Since resource participation in EDAM will be voluntary, i.e. there will not be an obligation to offer specific resources into the day-ahead market, this initiative must develop resource sufficiency evaluation criteria and related rules. Similar to the existing criteria and rules in the EIM, EDAM resource sufficiency rules must ensure that balancing authority areas do not inappropriately lean on the capacity, flexibility, or transmission of other balancing authority areas. As part of this, this initiative will explore potential mechanisms to trade resource flexibility and/or balancing authority area obligations needed to pass the resource sufficiency evaluation between EDAM balancing authority areas.

### 5.15.4 Ancillary services

The current CAISO day-ahead market co-optimizes energy and ancillary services. Most EIM entities participate in reserve sharing groups. This initiative will assess if day-ahead market ancillary services could complement existing reserve sharing groups and whether to enable trading of ancillary services between balancing authority areas. If ancillary services

procurement were included in the EDAM, a secondary question regarding how such reserves are deployed would also need to be addressed.

#### 5.15.5 Modeling of non-EDAM imports and exports

In the EIM and the existing day-ahead market, CAISO imports and exports are modeled as injections or withdrawals at the intertie scheduling point while EIM entities' imports and exports are modeled at the source/sink balancing authority areas. In light of other market modeling enhancements, this initiative will look to align the modeling approach of CAISO imports and exports to the approach currently used for EIM entities. In doing so, it will be necessary to consider the potential use of "scheduling hubs" as representations of import and export sources and sinks, e-tagging or settlement rule refinements, and remapping of congestion revenue rights to scheduling hubs.

#### 5.15.6 External Resource Participation

The EIM entity communicates its bilateral imports/exports through hourly base schedules. The EDAM design will also need to accommodate bilaterally contracted imports and exports in the day-ahead market and rules around how bilaterally contracted external resources can help a balancing authority area pass its resource sufficiency evaluation will also need to be developed. Currently, resources not operating within EIM entity balancing authority areas, e.g. external resources, do not economically participate in the EIM. This initiative will also explore the rules needed for economic participation of external resources in EDAM.

#### 5.15.7 Accounting for greenhouse gas (GHG) costs

The current EIM approach limits the potential GHG obligation attribution quantity to an EIM participating resource to the dispatch capability above its hourly base schedule. Imposing limitations on the amount of GHG awarded to an external participating resource was a recent market enhancement that sought to more accurately account for the emissions resulting from serving California (e.g., CAISO, SMUD) load. Assuming no base schedules in EDAM, a different approach will be needed to determine which resources are serving load within regions for which there are obligations for GHG costs. The EDAM GHG solution should also explore other unintended effects of remaining potential secondary dispatch effects and how to avoid them. In addition, the current paradigm defines GHG compliance regions by balancing authority area. Since other states in the West are looking at potential GHG programs, this initiative will look to define GHG compliance regions based upon a different approach, such as state boundaries.

#### 5.15.8 Convergence bidding

Convergence bidding can potentially improve market efficiency by providing greater day-ahead market liquidity that can potentially produce better convergence between day-ahead and real-time prices. Convergence bids that clear the day-ahead market are settled at the day-ahead price and liquidated in the real-time market at the 15-minute market price. For the EDAM, it will be necessary to determine if convergence bidding is universal across the EDAM footprint or enabled by individual balancing authority areas.

#### 5.15.9 Price formation

In the EIM entities' September 16, 2019 letter to the CAISO Board of Governors and EIM Governing Body, it was requested that the CAISO review price formation. This is a broad

ranging topic with relevant day-ahead and real-time markets considerations. The EIM entities specifically requested the CAISO to evaluate fast-start pricing and scarcity pricing so consideration of these design elements is included in this initiative.

#### **5.15.10 EDAM administrative fee**

In the EIM, the EIM administrative fee is determined based upon the services EIM entities and EIM participating resources receive through the EIM. This initiative will examine a similar approach for an EDAM administrative fee based upon the services provided through the EDAM.

### **5.16 EIM Governance Review Phase 2 (I, C, 1)**

This stakeholder-led initiative, which began in late 2018, seeks to develop a draft final proposal, or proposals, for revisions to the EIM governance structure in light of experience to-date and any further expansion of the market through an iterative public process. The EIM Governing Body, along with the CAISO Board of Governors, jointly created a temporary advisory group called EIM Governance Review Committee (GRC) to develop proposed revisions and provide input and advice to both bodies on matters relating to the EIM governance review. The Committee's work may include enhancements to current EIM governance as well as any refinements that may be needed to facilitate further expansion through the extension of the day-ahead market to EIM entities (EDAM). The draft final proposal or proposals developed by the Committee will be publicly posted and submitted to the EIM Governing Body and the CAISO Board for their review and consideration.

### **5.17 Transmission Access Charge Structure Enhancements (C)**

Formerly known as Review Transmission Access Charge Structure, this initiative considers possible changes to the structure of the transmission access charge. The CAISO currently applies the transmission access charge to each MWh of metered internal end-use load and exports to recover participating transmission owners' costs of owning, operating, and maintaining transmission facilities under CAISO operational control. Included in the initiative scope are questions such as: (1) whether today's purely volumetric structure should be retained, or should be changed to include other factors such as peak demand; and (2) whether the billing determinant for internal load should be modified to account for the load that is offset by the energy output of distributed energy resources.

This initiative's draft final proposal is complete and on hold pending policy development of the Extend Day-Ahead Markets to EIM Entities initiative to ensure the proposed policies have consistent treatment for transmission cost recovery. The CAISO anticipates presenting this policy to the Board of Governors in Q2 2020.

### **5.18 Multi Greenhouse Gas Area (D, 1)**

Pending other state's greenhouse gas regulations, this initiative would explore how the CAISO would incorporate different greenhouse gas rules into the market. Since balancing authority areas can be comprised of multiple states, this initiative will look at modifying the current attribution approach based upon balancing authority area boundaries to state geographic boundaries.



## 5.19 Storage as a Transmission Asset (SATA) (C)

This initiative considers using electric storage to provide grid services as a transmission asset, with all or a portion of costs recovered through the transmission access charge. This initiative would further explore issues around electric storage resources seeking to receive cost-based rate recovery for providing certain transmission services. It is also exploring enabling SATA resources to receive market revenues for their market participation.

This initiative is currently on hold pending the completion of the *Energy Storage and Distributed Energy Resources Phase 4* policy. The CAISO anticipates restarting this initiative in Q3 2020.

## 5.20 Real-Time Settlement Review (C, 2)

During the Real-Time Market Neutrality Settlement initiative, the CAISO committed to review the need for real-time settlement changes such as settlement charge codes, uplift payments, offsets, and loss calculations to ensure they are consistent with cost allocation principles. Any urgent changes will be made in this process, while longer-term modifications will take place in the Real-Time Market and EIM Refinements initiative.

## 5.21 Real-Time Market and EIM Refinements (C, 2)

This initiative will evaluate if additional improvements to the solve time of the 15-minute real-time unit commitment timeline would allow the optimization to initialize closer to the binding interval. This would allow inputs to the market optimization to use more current forecasts. The CAISO may also consider extending the horizon of short-term unit commitment process to allow for a longer look-ahead period, enabling it to commit resources that have a start-up time longer than five hours and to more optimally commit all resources, particularly those with limited starts. The CAISO also plans to review the re-optimization of ancillary services in both the 15-minute real-time unit commitment and 5-minute dispatch. Currently, only incremental ancillary services are procured in the 15-minute market. Along with these changes, the CAISO will address any longer term changes identified in the Real-Time Settlement Review process.

## 5.22 Dispatch Enhancements (C, 2)

This initiative was added to the catalog by the CAISO in July 2019. This initiative covers several topics, including Decremental Market Power Mitigation, Bid Floor, Exceptional Dispatch Decremental Settlement, Export Charges, Ramp Rate Limitations, and Accurate Curtailment Response. Dispatch Enhancements would review and develop enhancements to the current obligations for resources to comply with dispatch instructions.

### 5.22.1 Decremental Market Power Mitigation (C, 2)

During the stakeholder process for *Local Market Power Mitigation Enhancements 2018*, Desert Power raised the issue of decremental market power that was beyond the scope of the initiative. Consequently, the CAISO added this issue to the catalog as part of the February 2019 policy initiative catalog process. Currently, the market power mitigation test does not account for instances when a supplier can seek to exercise market power in the real-time market through low price bids below marginal costs. After a supplier has received a day-ahead schedule, a scheduling coordinator can submit a new bid curve into the real-time market. If a resource is dispatched through the real-time market above its day-ahead schedule, the imbalance is paid the locational marginal price. If a resource is dispatched below its day-ahead schedule, the

imbalance is charged the locational marginal price. In the event the locational marginal price is negative, the imbalance results in a payment to the scheduling coordinator. In the event that the resource must be dispatched lower to resolve congestion, suppliers who have the ability to exercise market power will submit negative priced bids below their marginal cost so that the scheduling coordinator will be paid by reducing generation. The current market power mitigation test does not test for this strategic bidding behavior. This initiative would explore solutions to prevent suppliers from strategically bidding to exert decremental market power.

### 5.22.2 Bid Floor (C, 2)

This initiative would examine lowering the CAISO's bid floor. On December 19, 2013, FERC accepted the CAISO's proposal to lower the bid floor from - \$30/MWh to -\$150/MWh under the notion of facilitating increased real-time economic bidding by variable energy resources. By lowering the bid floor, the opportunity costs of not producing for many variable energy resources could be reflected in the resource's economic bid. It also provides an incentive for resources with positive marginal costs to economically bid instead of self-schedule. Those resources can avoid negative prices in both day-ahead and real-time, for schedules above day-ahead, and generate more revenues in real-time for decremental dispatches below day-ahead. During the 2013 stakeholder initiative, it was contemplated that a further reduction to -\$300/MWh would occur at some later date.

Currently, the bid floor (-\$150/MWh) and bid cap (+\$1000/MWh) are not symmetrical. This results in under-scheduled load in the day-ahead market being potentially subject to real-time prices at the \$1,000/MWh bid cap, and for overscheduled load in the day-ahead market potentially incurring a cost of \$150 per MWh. Thus, the incentive for not under-scheduling load in the day-ahead market is not equivalent to the incentive for not over-scheduling load in the day-ahead market. Furthermore, as the supply fleet evolves towards a 50 percent renewable portfolio standard, there may be increased instances of over-supply conditions. A deeper pool of economic bids could enable the market to more efficiently manage over-supply conditions, but may require a bid floor such that resources are able to fully reflect the cost of not producing. The current bid floor of - \$150/MWh may not be sufficiently low enough to incent the procurement of downward flexible resources that will be needed as the CAISO we moves toward a 50 percent renewable performance standard. The current bid floor also may not provide accurate price signals during periods of high downward flexibility needs.

The CAISO discussed a lower bid floor with stakeholders in 2016 as part of the Bid Cost Recovery Enhancements initiative. The CAISO decided not to lower the bid floor after weighing both the benefits of a lower bid floor and the potential adverse effects of a lower bid floor, such as increased overall market costs. The CAISO decided the benefits would be limited because the market relatively infrequently curtails self-scheduled generation, indicating it rarely runs out of economic bids under the current bid floor. CAISO will continue to monitor levels of self-schedule curtailments and other market results to determine whether a lower bid floor is appropriate.

### 5.22.3 Exceptional Dispatch Decremental Settlement (C)

This initiative would explore changes to settlement rules for decremental exceptional dispatch energy including shutdown energy (energy from minimum load to shutdown). This initiative would review how decremental energy is settled at the lower of the locational marginal price,

default energy bid, or market bid. Additionally it would seek to clarify what a price is used when a resource is exceptionally dispatched to shut down from minimum load.

#### 5.22.4 Export Charges (C)

This initiative would address real-time intertie liquidity by increasing the quantity of export bids in the real-time market by exempting real-time exports from transmission access and measured demand uplift charges.

#### 5.22.5 Ramp Rate Limitations (C, 2)

This initiative was added to the catalog by the CAISO in July 2019. The CAISO's real-time market relies on resources, such as solar, during the afternoon to meet afternoon demand. However, renewable resource's energy can suddenly disappear from the market due to cloud cover, decrease in wind, a loss of power, etc. When these resources drop off the system, market operators dispatch ancillary services to backfill the energy needed to meet demand. Consequently, when renewable resources return to the market, they do so quickly and make it difficult for market operators to maintain a balanced system. This initiative would explore creating ramp limitations so when renewable resources return to the market, they can do so at a pace that does not jeopardize system balance issues.

#### 5.22.6 Accurate Curtailment Response (C, 2)

This initiative was added to the catalog by the CAISO in July 2019. In 2018, the CAISO clarified its existing obligations for eligible intermittent resources to comply with CAISO-issued dispatch instructions under its tariff. This initiative would review and develop enhancements to the current obligations for resource to comply with dispatch instructions.

### 5.23 Frequency Response Product (F)

This initiative will consider the development of a frequency response product to ensure that the CAISO can schedule and position resources to meet its NERC/WECC frequency response requirements. The CAISO seeks to examine a market structure that encourages frequency response capabilities of all participating resources, enables the diverse mix of resources to provide services, and ensures CAISO meets applicable reliability criteria. Without a market mechanism for frequency response capability or provision, CAISO's support of bulk electric system security is becoming increasingly difficult as the generation mix changes to accommodate a renewable portfolio standard of 50% renewables by 2030.

### 5.24 Joint Owned Unit Model (D, 2)

This initiative was added to the catalog by the CAISO in July 2018. Currently, the market models physical units owned by joint utilities as separate units. This initiative would examine modeling these units as one unit and determine how costs are distinguished between owners.

### 5.25 Ancillary Service Deliverability (C)

Currently ancillary services are procured based upon system and zonal requirements. The zonal requirements seek to minimize procuring large quantities of capacity in one region that may not be accessible if a contingency event occurs in a different region. But, the zonal approach does not guarantee that the ancillary services are deliverable because the capacity may be located behind a transmission constraint inside the zone. Operators perform studies to

identify day-ahead awards that are not accessible and block these resources from being awarded ancillary services so that additional capacity can be procured in the real-time market. This initiative will look at implementing nodal ancillary services by including a deployment scenario in the market optimization to ensure the capacity awards are transmission feasible when a contingency event occurs. This functionality will also support the re-optimization ancillary services in the real-time market because operators will be assured the capacity awards are deliverable.

## 5.26 Transmission-Distribution Interface (D)

This initiative was added to the catalog by the CAISO in July 2019 and will review roles and responsibilities at the transmission-distribution interface and how to effectively manage the grid with a growing share of energy coming from distributed energy resources. This initiative will also investigate effective models for managing distributed resources, including the role of distribution system operators and their interaction with the CAISO.

# 6 Discretionary Initiatives

## 6.1 Energy and Ancillary Services Markets

This section describes the discretionary policy initiatives that were suggested by either the CAISO or stakeholders. This category includes potential market design enhancements that impact the day-ahead and/or real-time markets. This section also includes topics such as price formation, outage management, and resource modeling.

As background, the CAISO's day-ahead market consists of the market power mitigation process, the integrated forward market and the residual unit commitment process. The structure and rules for the day-ahead market are presented in the business practice manuals for market operations and market instruments.<sup>13</sup>

The real-time market includes three market runs: the 15-minute granularity short-term unit commitment process, the 15-minute granularity real-time unit commitment process, and the 5-minute granularity real-time dispatch. The short-term unit commitment process and real-time unit commitment process both commit resources. The second interval of the short-term unit commitment process is used for the 15-minute market, which includes financially binding 15-minute energy and ancillary service schedules and prices. The 5-minute granularity real-time dispatch also produces financially binding 5-minute energy dispatches. For more details regarding the real-time market, refer to the business practice manuals for market operations and market instruments.<sup>14</sup>

The energy imbalance market (EIM) extends the real-time market to other balancing authority areas in the West. The CAISO's market minimizes overall dispatch costs across the combined footprint of all EIM entity balancing authority areas and the CAISO balancing authority area. The EIM improves reliability by increasing the operational awareness and responsiveness to changing grid conditions across its large footprint. Further, the EIM allows for more efficient integration of

<sup>13</sup> <http://www.caiso.com/rules/Pages/BusinessPracticeManuals/Default.aspx>

<sup>14</sup> Ibid.

renewable resources by capturing the diversity benefits across a geographical dispersed footprint.

Convergence (or virtual) bidding is a mechanism whereby market participants can make self-liquidating sales (or purchases) of non-physical energy in the day-ahead market, with the explicit requirement to buy back (or sell back) that energy in the real-time market. Virtual bids improve the efficiency of the markets because they tend to make day-ahead and real-time market prices converge.

Currently, the CAISO procures four types of ancillary services products in the day-ahead and real-time markets: regulation up, regulation down, spinning reserve, and non-spinning reserve. Section 4 of market operations business practice manual describes these ancillary services.<sup>15</sup> The CAISO introduced the real-time flexible ramping product in fall 2016 and plans to implement new market functionality and pricing modifications resulting from the *Contingency Modeling Enhancements* and *Generator Contingency and Remedial Action Scheme Monitoring* initiatives.

### 6.1.1 Export Scheduling Priorities (D)

This initiative was added to the catalog by the CAISO in September 2019 and will review changes to scheduling priority rules for exports that have specified their generation as non-resource adequacy. Currently, self-scheduled exports that are served by non-resource adequacy capacity or from non-RUC capacity have the same scheduling priority as internal load.<sup>16</sup> The market simply validates that a resource's generation capacity is participating in the real-time market. The resource's net qualifying capacity is not considered in this validation. As a result, the resource's generation capacity may not be sufficient in all 5-minute intervals to be equal to or greater than the self-scheduled export quantity. For example, assume a self-scheduled export is supported by an internal variable energy resource. The export is self-scheduled at the hourly forecast of the variable energy resource, but the resource's actual output varies within the hour. In some market intervals, the resource may generate more or below the self-scheduled export quantity. In intervals where the resource's generation output is less than the export quantity, other resources in the CAISO balancing authority area are dispatched higher in order to meet the export quantity amount. These other resources may include resource adequacy generation to meet the higher dispatch instruction. If resource adequacy resources are used to serve CAISO load, it may be more appropriate to place a higher scheduling priority over non-resource adequacy resources to meet an export quantity.

### 6.1.2 Energy Storage and Distributed Energy Resources (D)

This initiative was added to the catalog by the CAISO in July 2019. This initiative would explore enhancing the ability of CAISO connected and distribution-connected resources to participate in the CAISO market, including rooftop solar, energy storage, plug-in electric vehicles, and demand response. These resources represent an increasingly important part of the future resource mix and will help lower carbon emissions and provide operational benefits.

### 6.1.3 Use-limited Gas Resource Default Energy Bid (D, 2)

During the stakeholder process for *Local Market Power Mitigation Enhancements 2018*, Nevada Energy expressed use-limited gas resources have opportunities for bilaterally selling energy at

<sup>15</sup> <https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market%20Operations>

<sup>16</sup> CAISO Tariff, Section 34.12.1

different hub locations. The Western Power Trading Forum also expressed the opportunity cost methodology for use-limited gas resources should include daily limitations. Both issues went beyond the scope of the *Local Market Power Mitigation Enhancements 2018* initiative. Consequently, the CAISO added these issues to the catalog as part of the February 2019 policy initiative catalog process. *Commitment Cost Enhancements Phase 3* developed a default energy bid opportunity cost methodology for use-limited resources. This initiative would consider whether it is appropriate to account for bilateral energy sales at different hub locations and daily limitations in default energy bids for use-limited gas resources.

#### 6.1.4 Multi-Stage Generator Requirements (D)

Silicon Valley Power suggested in the January 2019 policy initiative catalog process that this initiative be added to the catalog. In 2010 the CAISO implemented new market rules to accurately model the unique operational and economic parameters of combined cycle generating units and other resources that have multiple operating or regulating ranges that limit the resource to operate in only one of those ranges at any particular point in time. At the time, the CAISO was unable to include Metered Subsystems or resources within a Metered Subsystem, Pumped-Storage Hydro Units, and Pumping Loads, and System Resources that are not Dynamic Resource-Specific System Resources from qualifying as Multi-Stage Generating Resources. These resources were excluded because the policy was developed to provide a method for modeling combined cycle units as required by FERC. The CAISO was unable to model all resources due to technology restraints. This initiative would explore expanding the CAISO's multi-stage resource model and registration process to include the previously exempt resources.

#### 6.1.5 Partial Pass Proposal – Ancillary Service Performance Audits (D)

Pacific Gas & Electric suggested in the July 2018 policy initiative catalog process that this initiative be added to the catalog. Under current CAISO market rules, if a resource fails two sequential Ancillary Service (AS) tests, the resource is disqualified from providing any of its' qualified amount of AS Reserve Capacity. To pass a test, a resource must deliver at least 90 percent of an ancillary service award within 10 minutes. The CAISO can request any ancillary service amount up to a resource's Ancillary Service Reserve Capacity as part of a contingency event or unannounced test. The current pass/fail testing does not distinguish resources that provided most of the ancillary service reserve capacity (e.g. 88% of the award) from those that completely failed to perform. This initiative would examine current disqualification rules and consider what level is appropriate for a resource to pass the ancillary service test.

#### 6.1.6 California ISO to Market Participant Relationship Enhancement (D)

Southern California Edison suggested in the July 2018 policy initiative catalog process that this initiative be added to the catalog. Currently, the CAISO relies on Scheduling Coordinators to provide information regarding the physical attributes of resources. While the CAISO has Participating Generator Agreements with resources, the CAISO does not rely on its relationship with the generator to meet the CAISO's requirements. CAISO has continued relying on Scheduling Coordinators to provide resource information, which if incorrect is ultimately the responsibility of the generator and places Scheduling Coordinators in an unnecessary intermediary role. This can lead to inefficiencies and costs due to the CAISO using unreliable data because it preferred that the Scheduling Coordinator provided data, when in fact the

resource owner should have done so. This initiative would explore changing the CAISO's Participating Generator Agreement requirement from scheduling coordinators to generators.

### **6.1.7 Flexible Ramping Product Enhancements**

The Department of Market Monitoring suggested in the 2017 policy initiative catalog process that this initiative be added to the catalog. This initiative would explore enhancements to the design of the flexible ramping product. The flexible ramping product design that was implemented in fall 2016 procures and prices the appropriate amount of ramping capability to account for the uncertainty in only five-minute net load forecasts. Flexible ramping product design enhancements in this initiative include locational procurement and pricing of flexible ramping capability, deliverability, and appropriately including the impacts of dispatchable-resource uninstructed deviations into the flexible ramping product demand curve and cost allocation.

### **6.1.8 Exceptional Dispatch Revenue Treatment in Bid Cost Recovery (D)**

This initiative was added to the catalog by the CAISO in July 2018 and would examine exceptional dispatch revenues that are currently not included in the daily netting of revenues. Additionally, it would examine costs for both day-ahead and real-time bid cost recovery calculations and determine if these revenues should be considered when offsetting bid costs.

### **6.1.9 BAA Islanding of Internal Regions (D)**

This initiative was added to the catalog by the CAISO in July 2018. This initiative will consider if a single balancing area authority (BAA) could island specific regions and continue to operate the market optimization dispatch for each region separately.

### **6.1.10 Bid Insertion from Short-Term Unit Commitment (STUC) (D, 2)**

This initiative was added to the catalog by the CAISO in August 2018. Currently, when clean bids are unavailable, the real-time market is unable to re-optimize the system. As a result, the real-time market utilizes advisory interval results from the last market optimization that had clean bids. When the horizon of advisory intervals is exhausted, a market disruption must be called. This initiative will evaluate means to continue to run the market optimization absent clean bids.

### **6.1.11 EIM Contingency Price Corrections (D, 1)**

This initiative was added to the catalog by the CAISO in July 2018. This initiative would examine what prices should be used in the market when the CAISO is in contingency dispatch mode (RTCD). Currently, MW prices from the advisory real-time dispatch solution and contingency solution do not match.

### **6.1.12 Settlement of Non-Conforming Loads in EIM Balancing Areas (D, 1)**

This initiative was added to the catalog by the CAISO in July 2018. Currently, the EIM rules require the non-conforming load responsible party to submit base schedules and updates during the hour to the EIM market. Non-conforming load is subject to EIM imbalance charges. EIM entities' Open Access Transmission Tariffs (OATT) do not allow them to pass imbalance charges through to non-conforming load, which puts a financial risk on EIM entities. This initiative would explore alternatives to administer non-conforming loads' imbalance charges if load volatility is supported by the EIM balance area authorities operating reserve during the scheduled operating time of the non-conforming load.

### 6.1.13 Over/Under Scheduling Load Enhancements (D, E1)

Puget Sound Energy, NV Energy, Idaho Power, Arizona Public Service Company, and Portland General Electric suggested in the 2017 policy initiative catalog process that this initiative be added to the catalog. This initiative was originally requested by NV Energy in 2016.

This initiative would examine possible improvements and enhancements to load forecasting transparency and accuracy. Items that could be discussed include changes to the existing penalty bands for EIM entities deviating from the forecast, the 1% exemption rule when an EIM entity uses the CAISO load forecast, additional situations that exempt an EIM entity when using the CAISO load forecast and actual load is off by the penalty bands. This initiative may also look at changes to the distribution of penalty revenues to balancing areas in the EIM that did not incur a penalty over the operational day. For example, allocating revenues on an hourly basis to EIM balancing areas that did not incur a penalty for that hour.

### 6.1.14 Limiting EIM Energy Transfer System Resource Transfers (D, 1)

Idaho Power Company suggested in the 2017 policy initiative catalog process that this initiative be added to the catalog. This initiative would explore limiting the magnitude of inter-interval changes to transfers of power dispatched by the EIM between EIM balancing areas. Idaho Power Company states that that large transfer changes between intervals has the potential to cause reliability issues.

### 6.1.15 Generator Modeling Enhancements (D, 2)

PacifiCorp suggested in the 2017 policy initiative catalog process that this initiative be added to the catalog. This initiative would examine the variety of different resource models within the CAISO market and potentially update them. PacifiCorp contends this would improve modeling of generating units (such as combined cycle, hydro, and coal units) and curtailable metered load, and improve the flexibility that could be offered into the market if those products were able to be modeled to better fit with the unique attributes of each type of generator.

### 6.1.16 Multi-Day Unit Commitment (D)

This initiative was added to the catalog by the CAISO in October 2017 and was based on the *Combined Integrated Forward Market/Residual Unit Commitment with Multi-Day Unit Commitment* initiative listed in last year's catalog. This initiative would evaluate if the day-ahead market should include a multi-day unit commitment. Having the day-ahead market look out two to three days would create more efficient commitment decisions that would better reflect whether resources are expected to run for a single day or multiple days.

### 6.1.17 Full Network Model Expansion – Phase 2 (C, 2)

This initiative would be the second phase of the Full Network Mode Expansion initiative implemented in fall 2014. That initiative provided reliability and market efficiency benefits by enhancing the CAISO's modeling capabilities to account for unscheduled flows and enforce intertie power flow constraints in the day-ahead market. As part of this, the full network model topology was expanded to include information on resources, load, and interchange schedules in other balancing authority areas.

Phase 2 would explore modeling imports and exports into the CAISO balancing at their actual source and sink to improve the CAISO market's modeling of actual electrical flow. Although the



CAISO market currently uses an approximation of this for imports and exports to and from EIM areas, it currently models imports and exports to and from the CAISO balancing areas as point injections and withdrawals at the intertie scheduling point. Consistent modeling across the CAISO and EIM balancing areas would improve the market's accuracy. For both the CAISO and EIM balancing areas, the initiative would likely consider the potential use of "scheduling hubs" as representations of import and export sources and sinks, e-tagging or settlement rule refinements, and remapping congestion revenue rights to scheduling hubs.

#### **6.1.18 Regional Integration (D)**

The California legislature and other stakeholders continue to consider a framework for extending the CAISO balancing area and day-ahead market to multiple states. This initiative would consider modifications to the CAISO markets and associated rules to accomplish a regionally integrated market that address resource adequacy, transmission cost recovery, grid management charges, and a governance structure.

#### **6.1.19 Ancillary Services Verification, Compliance Testing, and Auditing (D)**

This initiative was added to the catalog by the CAISO in October 2017. This initiative would consider revisions to the CAISO's program for ancillary services performance audits and compliance tests. Under section 8.9 and 8.10 of its tariff, the CAISO conducts both performance audits of how resources with spinning reserve and non-spinning reserve awards respond to contingency dispatches as well as unannounced compliance tests conducted by operations. Pursuant to the CAISO's operating procedures, a resource must reach 90 percent of its awarded capacity within 10 minutes to pass a performance audit or compliance test. This initiative would consider changes to the payment rescission rules associated with this program as well as eliminating the issuance of notices to regulatory authorities when resource adequacy resources do not pass an ancillary services performance audit or compliance test.

#### **6.1.20 Fast Frequency Response (D)**

This initiative would explore a potential separate market product for resources to provide automatic, autonomous fast frequency response. This would entail providing frequency response within a much shorter timeframe (i.e. within 60 cycles) than within the primary control horizon, generally within seconds provided by automatic generator response, load response (typically from motors), and other devices that provide an immediate response based on local (device-level) control systems. This service is also referred to as synthetic inertia. CAISO procurement of this service may be needed in the future to assist in arresting frequency decay once the system has even higher levels of renewables and the system's inherent inertia is insufficient to arrest frequency decay in a timely manner.

#### **6.1.21 Regulation Pay-for-Performance Enhancements (D)**

ARES suggested in the 2017 policy initiative catalog process that this initiative be added to the catalog. The CAISO implemented a market design for a regulation market in response to FERC's directive under Order 755. In this design, the CAISO compensates resources for their performance through a mileage payment. This initiative would review and analyze the current method of compensating resources in the regulation market, potentially explore enhancements to the pay-for-performance payments, and/or explore enhancements to the CAISO's minimum performance criteria and regulation certification process.

### 6.1.22 Regulation Service Real-Time Energy Make Whole Settlement (D)

This initiative would examine whether rule changes are appropriate for the settlement of real-time imbalance energy when resources are providing regulation. The regulation up and regulation down products allow the CAISO to move a resource up or down, respectively, in real-time within a defined capacity range using automatic generator control. The resulting imbalance energy is settled as real-time instructed imbalance energy at the real-time price. NCPA noted the price of this imbalance energy can result in a significant net loss to a resource despite the resource performing as dispatched by the CAISO. For example, the CAISO market can schedule a resource for downward regulation and then move the unit down in real-time. If the energy price is high, this can result in the resource “buying-back” its energy schedule at a loss.

### 6.1.23 Fractional Megawatt Regulation Awards (D)

SDG&E proposed in a previous policy initiative catalog process that this initiative be added to the stakeholder initiatives catalog. This initiative would explore the CAISO establishing minimum thresholds for regulation awards. SDG&E has observed that certain of its automatic generation capacity capable (AGC-capable) units receive regulation awards of as little as 0.01 MW, which is not only infeasible but also removes otherwise available capacity above the regulation range from the market. An effective solution may be to enable market participants to specify a minimum regulation award quantity.

### 6.1.24 Multi-Stage Generator Regulation Refinements (D)

This initiative was added to the catalog by the CAISO in September 2015. When there is low hydro availability, CAISO operations is more dependent on the thermal units on automatic generation control. This requires more realistic regulation modeling for the thermal units. One advantage of the multi-stage generator model is if a plant could provide regulation at different configurations, every configuration could have its own regulation bid price and regulation ramp rate.

### 6.1.25 Allowing Convergence Bidding at CRR Sub-Load Aggregation Points (D)

WPTF suggested during a previous policy initiative catalog process that this initiative be added to the catalog. Currently convergence bidding does not allow virtual bids at congestion revenue right sub-load aggregation points. WPTF would like the CAISO to consider adding congestion revenue right sub-Load Aggregation Points to the available locations for convergence bidding.

### 6.1.26 Implement Point-to-Point Convergence Bids (D)

DC Energy suggested during a previous policy initiative catalog process that this initiative be added to the catalog. This initiative would examine market rules to allow market participants to bid point-to-point – a source and a sink combined with specified up to congestion price. Point-to-point up-to-congestion bids would clear as long as the specified congestion spread bid is greater than the congestion spread in the day-ahead market. Congestion spread is the difference between the sink and source’s locational marginal price in the day-ahead market. A point-to-point up-to-congestion bid will pay the difference of locational marginal price at the sink minus locational marginal price at the source in the day-ahead market and will be paid that difference in the real-time market. These price differences may be positive or negative, determining whether the market participant is paid or has to pay in either market.

### 6.1.27 Review of Convergence Bidding Uplift Allocation (D)

This initiative would explore a settlement rule to allocate real-time congestion offset costs to convergence bids to the extent convergence bids contribute to these costs. These offset costs can occur when the CAISO needs to adjust constraint limits downward in the 15-minute market below levels incorporated in the day-ahead market model. For instance, this occurs due to transmission de-rates or modeling inaccuracies that cause actual flows to exceed the available transmission. This can cause significant real-time imbalance offset costs currently allocated primarily to load-serving entities.

### 6.1.28 Enhancing Participation of External Resources (D, 1)

This initiative would investigate potential EIM enhancements to allow participation of resources in balancing authority areas that have not joined the energy imbalance market. The proposed changes will ensure that external participation is complementary and compatible with bilateral trades. In addition, the external resources will need to meet similar requirements of EIM participating resources. Such as locational bidding of a physical resource, modeling of resource characteristics, telemetry, and metering to enable accurate modeling of physical flows, congestion management, and ensure feasible dispatches. Also, these external resources will need to be subject to market power mitigation procedures and make transmission available to exclusively accommodate its maximum bid range. Lastly, rules will need to be developed to address potential leaning by extending the resource sufficiency evaluation to external participation.

### 6.1.29 Potential EIM-wide Transmission Rate (D, 1)

This initiative would develop and design evaluation criteria to assess the merits of alternative transmission service rates for transmission compensation in the EIM. The CAISO would likely consider the following alternatives that were outlined in the EIM draft final proposal:

- Reciprocity in Use of Transmission Made Available by Rights-Holders
- Transmission Access Charge
- Transfer Charge as a Minimum Shadow Price
- Transmission Access Charge Applicable to Load and Wheeling<sup>17</sup>

### 6.1.30 Flow Entitlements for Base / Day-ahead Schedules (D, 1)

This initiative would evaluate adding this functionality if there is a material impact on the constraints within a balancing authority area in the EIM footprint from other EIM balancing authority areas or the CAISO. Currently, the real-time congestion offset is allocated based solely upon where the constraint is located. This design change would allocate a portion of a balancing authority area's real-time congestion offset to other balancing authority areas in the EIM in the event that base schedule flows exceed agreed to flow entitlement.

### 6.1.31 Equitable Sharing of Wheeling Benefits (D, 1)

This initiative would evaluate wheel-through transactions occurring throughout the EIM area. A wheel through is a transaction in which an EIM Entity facilitates a transfer without sourcing or sinking energy. When a wheel through occurs, the entity "in the middle" receives no direct financial

<sup>17</sup> The Energy Imbalance Market Draft Final Proposal can be found at:  
<https://www.westerneim.com/Documents/EnergyImbalanceMarket-DraftFinalProposal092313.pdf>

benefit even though they facilitated the transfer. This initiative will also investigate the need for compensation when net wheeling occurs.

This initiative was originally considered in 2017 but it was determined at the time that all EIM Entities currently benefit more than they facilitate wheels. Therefore, because all entities receive direct financial benefit from the EIM (in comparison to net wheeling), an ex-post settlement or hurdle rate to compensate for wheels was not favorable. This item will remain in the catalog and can be revisited if it is prioritized and deemed necessary. Wheeling data will be published quarterly in the EIM Quarterly Benefits Report.

### 6.1.32 Third Party Transmission Contribution (D, 1)

The initiative would explore allowing third parties to contribute transmission capacity located between two EIM Balancing Authority Areas for use in the EIM. This would increase energy transfer throughout the EIM area and enable the third party to receive congestion rents. This initiative was originally considered in 2017, but it was determined at that time the implementation costs may outweigh use and benefits. The CAISO agreed to keep this item in the catalog so it can be prioritized at a later date if deemed necessary.

The CAISO believes implementation of the third party transmission contribution may address concerns regarding transmission compensation for net wheeling. For example, if an EIM entity releases available transmission capacity to the EIM, this may exceed the EIM transfer in and EIM transfers out of that Balancing Authority Area needed to meet its own imbalance energy needs. The EIM entity may be concerned that other market participants are not submitting hourly base schedules for wheel transactions, but rather waiting for the EIM because the market participant knows there would be unused transmission made available such that the wheel transaction had a very high probability of flowing in the EIM and avoiding the transmission charges. The EIM entity could modify its open access transmission tariff such that only transmission necessary to meet its own imbalance is release to the EIM. This now removes the high level of certainty that the wheel transaction will flow in the EIM. The market participant now has an incentive to procure transmission and if the market participant did not want base schedule the wheel, the market participant could contribute the transmission to the EIM which would enable the wheel to flow if economic in the EIM.

### 6.1.33 Bidding Rules on External EIM Interties (D, 1)

Currently, the EIM design allows full discretion to the EIM entity as to whether real-time economic bidding is allowed on intertie scheduling points with balancing authority areas outside the EIM footprint. This initiative would determine the calculation of a default energy bid for intertie transactions and other issues to resolve should an EIM entity decide to allow economic bidding at its interties. *Full Network Model Expansion – Phase 2* would be a necessary precursor to this initiative so that the CAISO would model economic bids consistently between CAISO and EIM areas.

### 6.1.34 Hourly Bid Cost Recovery Reform (D, 2)

The CAISO implemented market changes in 2014 that separated bid cost recovery calculations and payments between the day-ahead and real-time markets. This initiative would break the bid cost recovery review horizon further in real-time which is in line with the Market Surveillance Committee's opinion on the bid cost recovery rule changes wherein it suggests that "separable

decisions" should receive separate bid cost recovery. One possibility is to afford separate bid cost recovery to separate commitments of short-start units in the real-time market.

### **6.1.35 Inter-Scheduling Coordinator Trade Adjustment Symmetry (D)**

NRG suggested in a previous stakeholder initiative catalog process that this initiative be added to the catalog. Currently, market participants engage in an Inter-Scheduling Coordinator Trade (IST) based on a forecast for a variable energy resource (VER). The CAISO then updates the VER forecast, if the revised forecast is lower than the amount in the agreed upon IST, the IST is reduced and the Scheduling Coordinator (SC) for the VER is "forced" into a Converted Physical Trade (CPT) for the difference between the previous IST and the new IST. However, if the revised CAISO VER forecast is higher than the amount in the IST, the IST is not adjusted. This creates asymmetrical treatment in two ways: (1) by forcing the VER SC into a CPT only where the forecast is lower but never forcing the SC for the VER buyer into a CPT where the forecast is higher, and (2) creating a mechanism in which the amount of the IST can only be reduced, but never increased, by a more accurate forecast. If the CAISO VER forecast is unbiased, the IST should be allowed to go up – creating a CPT for the SC buyer – when the T-45 forecast is higher than the IST.

### **6.1.36 Extending the submission deadline for Real-time Inter-SC trades (D)**

Boston Energy Trading and Marketing suggested in the 2017 policy initiative catalog process that this initiative be added to the catalog. This initiative would examine a mechanism to allow for inter-scheduling coordinator trades (IST) to reflect bilateral contracts transacted in the real-time. The real-time IST would allow CAISO to account for these bilateral contracts between two parties through the real-time market in its Fifteen Minute Market and Real-Time Dispatch settlements. This would reduce the Scheduling Coordinator (SC) need to perform additional transactions outside of CAISO Market while mitigating against potential double settlement both in the organized and bilateral markets. It would also examine extending the inter-SC physical trade submission deadline until some period after the hour is completed or allow Variable Energy Resources to update their inter-SC physical trade MW value some period after the hour is completed.

### **6.1.37 FMM Block Scheduling of Demand Response Resources (D, 2)**

PG&E suggested during the 2017 policy initiative catalog process that this initiative be added to the catalog. This initiative would explore enhancements to Reliability Demand Response Resources through block scheduling to dispatch these resources in the real-time market only in the 15-minute market.

### **6.1.38 Marginal Loss Surplus Allocation Approaches (D)**

Since the start of the CAISO's nodal market, the CAISO has allocated the marginal loss surplus based on measured demand. This methodology was accepted by FERC in its September 21, 2006 Market Redesign Technology Upgrade order. PG&E previously expressed concerns regarding the accepted methodology and suggested an alternative approach to allocate marginal loss surplus. The CAISO agreed to study alternatives and published analyses in April 2007 and October 2010 comparing its current methodology to other proposed alternatives. The April 2007 report found that allocation based on measured demand was within the bounds of alternative methodologies. Using data from the first year of operation after the start of the nodal market, the October 2010 report found that allocation based on measured demand did not lie within the

bounds of alternative methodologies. Based on these results, the CAISO agreed to perform further analysis using “data covering the period after April 1, 2010, which will further inform the stakeholder process”. To re-launch this stakeholder process, the CAISO would need to release an update to the October 2010 report.

### **6.1.39 Multi-Stage Generator Bid Cost Recovery (D, 2)**

In 2014, the CAISO implemented market design changes resulting from the completed “Renewable Integration Market and Product Review” and “Bid Cost Recovery Mitigation Measures” initiatives that separately calculates bid cost recovery for the day-ahead and real-time markets. For non-multi-stage generators, this is a straightforward calculation that clearly assigns costs to either market. However, multi-stage generators may be committed in different configurations between the day-ahead and real-time markets. This initiative would further refine the allocation of costs between the day-ahead and real-time markets for multi-stage generators committed in different configurations in the two markets.

### **6.1.40 Extended Pricing Mechanisms (D, 2)**

This initiative would explore extended pricing mechanisms to either incorporate non-priced constraints into energy prices or to reduce uplifts. An example of an extended pricing mechanism is the Midwest ISO’s “extended locational marginal pricing (LMP).” Extended LMP, or convex hull pricing, is a pricing methodology that incorporates the costs of resource commitment and dispatch in energy clearing prices. LMPs only capture generator dispatch costs based on incremental energy bids and do not directly account for unit start-up or transition costs, minimum load costs, and impact of discontinuous minimum and maximum generation physical parameters. These additional costs are typically incurred by fast start or fast response resources such as gas turbines and demand response. Extended LMPs aim to better reflect the full cost of satisfying demand.

### **6.1.41 Integrated Optimal Outage Coordination – Phase 2 (D)**

This initiative would examine including economic criteria for approving or rejecting planned outage repair requests. In an effort to improve and expedite outage management studies and decisions on system-wide level, the CAISO is developing an analysis engine capable of solving the short-term integrated optimal outage coordination. The “Integrated Optimal Outage Coordination” application is intended to provide a comprehensive support for the operation engineers and outage coordination groups in their evaluation and approval process of both transmission and generation outages in an integrated system-wise and optimal manner.

Using the Integrated Optimal Outage Coordination application, the CAISO will have the ability to consider physical characteristics of resources, system and network constraints in addition to the constraints associated with independent and dependent repairs. The Integrated Optimal Outage Coordination application will provide an optimal outage schedule while ensuring reliable system operation. In the first phase, the resulting outage schedule will be optimal in the sense that it can minimize bid-in costs while taking into account physical constraints of generating and transmission assets and maintaining power system reliability requirements.

### **6.1.42 Rescheduled Outages (D)**

Currently, section 9.3.7 of the CAISO tariff describes the process by which the CAISO may cancel or change an approved maintenance outage if it is “required to secure the efficient use and reliable operation of the CAISO-Controlled Grid.” Section 9.3.7.3 describes what compensation will be

paid to a participating transmission owner or participating generator as the result of the cancellation of an approved maintenance outage. Stakeholders have indicated that they believe this may not adequately consider their situations and would like to re-examine these rules to ensure that they result in the most efficient operation of the grid and their resources and ensure fair compensation.

### 6.1.43 Aggregated Pumps and Pumped Storage (D)

This initiative would include enhancements to participating load that would improve participating load's ability to participate more fully in the market. Since the implementation of the CAISO's nodal market in 2009, participating load's functionality has been limited to providing non-spinning reserves. State Water Project recommends that the CAISO conduct a study on what improvements could be made to participating load functionality that would provide system benefits and conforms to pumping load/pumping storage limitations. For instance, SWP believes that the ability for participating load to bid demand in the real-time market would greatly reduce the current barriers to participating load's participation in wholesale demand response and possibly improve system reliability during over-generation periods. Also, by allowing participating load to change its demand bid in the real-time market, participating load could potentially better respond to ramping needs by shifting demand during critical ramping periods when water conditions permit.

## 6.2 Congestion Revenue Rights

This section describes potential enhancements to the CAISO's rules and systems related to congestion revenue rights (CRRs), including both short-term (*i.e.*, one-year seasonal and monthly) CRRs, as well as long term CRRs. The CAISO allocates CRRs to load serving entities in the CAISO balancing area and makes them available to all market participants through auction. Further details are available in the business practice manual for CRRs.

### 6.2.1 Long-Term Congestion Revenue Rights (D)

This initiative would explore potential long-term CRR products, as well as refinements to the long-term CRR products. These would include some or all of the following items:

- A multi-period optimization algorithm for long-term CRRs. When the CAISO performed the initial release of long term CRRs for the period 2008-2017, the simultaneous feasibility test optimization treated the entire 10-year time horizon as a single time period (for each combination of season and time of use period) with respect to network model assumptions. A multi-period algorithm may result in a more optimal allocation of long term CRRs because it would reflect different assumptions for each year regarding the availability of grid capacity for CRRs, in particular the known expiration of previously released long term CRRs, existing transmission contracts, and converted rights.
- Flexible term lengths of long-term CRRs. FERC's July 6, 2007 Order on CRRs encouraged the CAISO to consider future flexibility to allow: (1) long-term CRRs in excess of 10 years; (2) annual CRRs with guaranteed renewal rights up to year 10; or, (3) long term CRRs with terms ranging from 2 to 9 years. FERC notes that any subsequent change in the available term lengths would have to respect the rights of the holders of any outstanding 10-year CRRs. This initiative could modify the annual CRR process to allow

market participants in subsequent auctions to submit bids/offers for any remaining months in the current year, as well as any block of months in the current year.

- A long-term CRR auction. The CAISO's January 29, 2007 compliance filing on long term CRRs noted that several parties wanted the CAISO to implement an auction process for long term CRRs, which the CAISO agreed to consider for a future release. FERC's July 6, 2007 order on CRRs encouraged the CAISO to initiate a stakeholder process and file tariff language to implement an auction for residual long term CRRs in a future release of the new market. If the CAISO and the stakeholders decide to move forward with a long-term CRR auction, the ability to sell CRRs in the auctions would be included in the scope of that effort.

### 6.2.2 Congestion Revenue Rights Revenue Sufficiency (D)

This initiative would also evaluate various improvements to revenue sufficiency which would include some or all of the following items:

- Improved Requirements for Transmission Outage Submission. DC Energy proposed in a previous catalog process that this initiative be added to the catalog. According to the Outage Management Business Practice Manual, "requests for planned outages of Significant Facilities must be submitted to CAISO Outage Coordination at least 30 days prior to the start of the calendar month for which the outage is planned to begin". The "30-day rule" is intended to improve the fidelity of the Monthly CRR network models, however the current construct does not include an incentive mechanism for adhering to the rule. That is, the rule is advisory only and there is no implication for schedules submitted inconsistent with the rule's timeline. Adhering to the rule has numerous important benefits since outages on Significant Facilities significantly impact the amount of CRR network capacity offered and the resultant CRR revenue adequacy. In addition, it promotes the transparency of high impact outages, which can help rationalize CRR clearing prices and foster CRR price convergence.

DC Energy proposed a similar initiative in the 2017 catalog process, requesting the CAISO post information related to CRR modeling on its market participant portal and address advanced notification changes to congestion management, requiring entities to submit transmission outages so they can be included when submitting nomination in the CRR market model, and expanding the definition of significant entities to possibly include 100kV elements.

- CRR Allocation. CDWR requested this initiative in a previous catalog process that the CAISO introduce revise the Counter-flow CRR methodology used for allocating CRRs sourced at the trading hubs. CDWR believes that the current methodology contributes to revenue imbalance of the CRR balancing account and is counterproductive to the stated purpose for CRRs.

## 6.3 Resource Adequacy

The CAISO works closely with local regulatory authorities to develop and implement resource adequacy policies, processes, and rules that ensure sufficient capacity exists in the balancing



area in the right places and with the right capabilities. While the CAISO does not take the lead role in establishing system resource adequacy requirements, the CAISO does have specific and essential responsibilities in most all resource adequacy related functions, including establishing local and flexible resource adequacy capacity needs.

### 6.3.1 Multi-Year Resource Adequacy (D)

This initiative was added to the catalog by the CAISO in July 2019 as a placeholder to address changes needed in the CAISO's resource adequacy provisions to accommodate multi-year resource adequacy program and its potential application to CAISO market participants as necessary and appropriate.

## 6.4 Interconnection

This section includes discretionary policy initiatives related to interconnection.

### 6.4.1 Sunset Reimbursement of Network Upgrades (D)

Pacific Gas and Electric suggested in the 2018 policy initiative catalog process that this initiative be added to the catalog. In 2003, FERC Order No. 2003 established standard procedures and agreements for interconnection of generators larger than 20 megawatts. The order also required Interconnection Customers reimbursement of costs associated with Network Upgrades within a five-year period. Within the CAISO, reimbursement of Reliability Network Upgrades has been limited to \$60,000 per MW since Cluster 5. This initiative would explore suspending the policy where generators within the CAISO balancing area authority are reimbursed for the funds provided for the design, permitting and construction of Reliability Network Upgrades and for Local Delivery Network Upgrades.

## 7 Proposed Deletions

This section includes initiatives that were deleted from this version of the catalog.

### 7.1 2020 Interconnection Process Enhancements

**Reason for deletion:** All interconnection process-related enhancements are being tracked in a separate forum by the interconnection team.

#### Previous Description

This initiative explores addressing modifications and clarifying previous generator interconnection process policy and support changing state policy goals. Topics to be considered but not limited to, modifying the effective date of study agreements after a project has been validated; deliverability driven reliability network upgrades and associated cost reimbursement, and other potential topics received from stakeholders.