



Draft 2022 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.¹

This catalog is organized into the following sections:

- Initiative Categorization
- Stakeholder Policy Initiatives Catalog Submissions
- 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

The CAISO typically 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.² 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

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

² <http://www.caiso.com/informed/Pages/StakeholderProcesses/AnnualPolicyInitiativesRoadmapProcess.aspx>
CAISO/M&ID

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

This year, the CAISO publishes this draft catalog in April instead of February to allow time for the CAISO to identify new initiatives needed following the summer 2021 readiness effort.

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.³

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.⁴

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

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

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

4 – EIM Governing Body’s hybrid- not EIM driven

A category 1 classification is any policy initiative that involves market rules changes that fall entirely within the EIM governing body’s primary authority.⁵ A category 2 classification is any policy initiative proposing changes to rules that are within the EIM Governing Body’s advisory authority.⁶ 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.⁷ 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.⁸ If an initiative is not within EIM Governing Body authority, they are classified within this catalog as N/A.

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*.⁹

3 Stakeholder Policy Initiatives Catalog Submissions

This section lists stakeholders’ submissions since the last catalog update.

3.1 Submissions Incorporated

The following stakeholder initiative requests have been added to the catalog:

- **Market Enhancements for Summer 2021 Readiness (I, C, 4)** was added by the CAISO. This initiative is located in section 5 Initiatives Completed Since Previous Catalog.
- **Energy Storage Enhancements (I, C, 2)** was added by the CAISO. This initiative is located in section 6 Initiatives Currently Underway and Planned.
- **Load, Export, & Wheeling Priorities Phase 2 (C, N/A)** was added by the CAISO. This initiative is located in section 6 Initiatives Currently Underway and Planned.
- **EIM Resource Sufficiency Evaluation Enhancements (C)**, was added by the CAISO. This initiative is located in section 6 Initiatives Currently Underway and Planned.
- **FERC Order 2222 (D, 2)** was added by the CAISO. This initiative is located in section 7 Discretionary Initiatives.

3.2 Submissions Precluded

The following stakeholder initiative requests have not been included in the catalog:

⁵ Ibid.

⁶ Ibid.

⁷ Ibid.

⁸ Ibid.

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

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- **FERC Electric Quarterly Report Transaction Data for EIM Participants:** This initiative was submitted by Arizona Public Service (APS) in 2021 and would enable the CAISO to provide EIM participants with a FERC Electric Quarterly Report (EQR) transaction data for EIM transactions. APS states having the EQR process completed by the CAISO for EIM transactions would benefit EIM participants by reducing overall level of effort and align data submission across all EIM participants.

The CAISO has not included this proposed initiative in this catalog because this effort does not include policy changes. The CAISO has sent this request to the appropriate CAISO team for their consideration.

4 Changes Since Previous Version

The CAISO made the following changes to the catalog published on September 14, 2020:

1. Updated the Introduction.
2. Added Stakeholder Policy Initiatives Catalog Submissions section.
3. Updated the Changes Since Previous Version section.
4. Updated Section 5 Initiatives Completed Since Previous Catalog.
5. Added Resource Adequacy Enhancements Phase 1 (I, C, N/A) to Section 5 Initiatives Completed Since Previous Catalog.
6. Added Market Enhancements for Summer 2021 Readiness (I, C, 4) to Section 5 Initiatives Completed Since Previous Catalog.
7. Added Real-Time Settlement Review (C, 2) to Section 5 Initiatives Completed Since Previous Catalog.
8. Added Western EIM Base Schedule Submission Deadline (C, 1) to Section 5 Initiatives Completed Since Previous Catalog.
9. Added Western EIM Sub-Entity Scheduling Coordinator Role (I, C, 1) to Section 6 Initiatives Currently Underway and Planned.
10. Added Energy Storage Enhancements (I, C, 2) to Section 6 Initiatives Currently Underway and Planned.
11. Added Maximum Import Capability Enhancements (I, C, N/A) to Section 6 Initiatives Currently Underway and Planned, updated description, and removed from Section 7 Discretionary Initiatives.
12. Added Load, Export, & Wheeling Priorities Phase 2 (C, N/A) to Section 6 Initiatives Currently Underway and Planned.
13. Updated Resource Adequacy Enhancements Phase 2 (I, C, N/A) description.
14. Updated Day-Ahead Market Enhancements (I, C, 2) description.
15. Combined Scarcity Pricing Enhancement and System Market Power Mitigation (C, 2) into one initiative.
16. Added EIM Resource Sufficiency Evaluation Enhancements (C, 2) to Section 6 Initiatives Currently Underway and Planned.
17. Updated Dispatch Enhancements (C, 2) description.
18. Updated Storage as a Transmission Asset (SATA) (C, N/A) description.
19. Added FERC Order 2222 (D, 2) to Section 7 Discretionary Initiatives.

20. Removed Export Scheduling Priorities (D, N/A) from Section 7 Discretionary Initiatives and included its scope in the Load, Export, & Wheeling Priorities Phase 2 (C, N/A) initiative.
21. Removed Deletions Section.

5 Initiatives Completed Since Previous Catalog

This section lists the initiatives where the policy development has been completed since the CAISO published the 2021 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.

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

5.1 Resource Adequacy Enhancements Phase 1 (I, C, N/A)

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 proposed reforms to the CAISO's resource adequacy rules, requirements, and processes to ensure the future reliability and operability of the grid. The Phase 1 changes can be implemented quickly to provide greater assurance resources providing resource adequacy capacity are available when and where needed to meet system and local needs beginning in summer 2021. With stakeholders, the CAISO explored the following topics:

- A minimum state of charge requirement for resource adequacy storage resources that will be in place on an interim basis while the ISO and stakeholders consider market enhancements to better manage storage resources as key reliability resources;
- Enhancements to the existing planned outage process that will better ensure planned outages are fully replaced with substitute capacity; and,
- Expansion of the local capacity procurement mechanism backstop authority to ensure sufficient energy in local capacity areas.

The Board of Governors approved this initiative at their March 24, 2021 meeting.

5.2 Market Enhancements for Summer 2021 Readiness (I, C, 4)

This initiative proposed market enhancements to prepare for tight system conditions in summer 2021 in light of the performance of the CAISO markets during the summer 2020 heat events. The changes responded to findings in the CAISO/CPUC/CEC Root Cause Analysis^[1] of summer 2020's controlled load shedding, the CAISO's own analysis, and stakeholder concerns.

The CAISO proposed the following enhancements:

¹⁰ <http://www.caiso.com/StakeholderProcesses/>

^[1] California Independent System Operator, California Public Utilities Commission, and California Energy Commission. Final Root Cause Analysis Mid-August 2020 Extreme Heat Wave. January 13, 2021. <http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>
CAISO/M&ID

- Modify market penalty parameters to reconsider the scheduling priority given to export and wheel through self-schedules relative to CAISO load;
- Strengthen import offer incentives by providing imports a bid price make-whole payment during tight system conditions;
- Provide stronger price signals for enhanced supply incentives during tight supply conditions;
- Enhance dispatch of reliability demand response resources through the market to provide more accurate pricing;
- Enhance Energy Imbalance Market (EIM) processes to better ensure each BAA participates in the EIM with sufficient resources and improve operational coordination between BAAs; and,
- Enhance interconnection process changes to expedite new supply interconnections to the grid.

The Board of Governors approved this initiative at their March 24, 2021 meeting and April 21, 2021 meeting. The EIM Governing Body approved an element under their primary approval authority at their March 10, 2021 meeting.

5.3 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. This initiative proposed three changes. The first requires all EIM BAAs to settle Base ETSR schedule deviations at Scheduling Point – Tie prices. The second allows EIM BAAs who derive their load indirectly using generation and intertie meters to choose not to have CAISO settle their unaccounted for energy. The third adjusts the allocation of real-time BCR uplift costs to load, exports, and EIM transfers.

The EIM Governing Body approved this initiative at their December 2, 2020 meeting.

5.4 Western EIM Base Schedule Submission Deadline (C, 1)

This initiative was added to the catalog by the CAISO in July 2018. Prior to this initiative, financially binding base schedules were required to be submitted by the EIM entity Scheduling Coordinator at T-40. Subsequent to this, the final hourly resource sufficiency evaluation was performed and incremental upwards EIM transfers were locked in the event of the tests being failed. This initiative moved the final base schedule submissions to T-30. Moving this deadline provides a more accurate resource sufficiency evaluation as well as an additional resource sufficiency evaluation and curing period for an EIM entity. This required moving the fifteen-minute market run that currently starts at T-37.5 to after the T-30 deadline.

This initiative also modified the current base schedule rules that prevented submission of non-zero base schedules associated with generation resources when the base schedules are below a resource's minimum load. This change allows an EIM entity to account for energy produced when a generator is starting within their submitted base schedules for consideration in the resource sufficiency evaluation.

The EIM Governing Body approved this initiative at their December 2, 2020 meeting.

6 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*.

6.1 Western EIM Sub-Entity Scheduling Coordinator Role (I, C, 1)

This initiative was added by the CAISO in July 2020 to develop a new EIM role that will allow separate scheduling and settlement for entities within an EIM entity balancing authority area. This will increase transparency for EIM third party customers and flexibility for EIM entities in the management of what would otherwise be non-participating resources. This initiative established a new scheduling and settlement relationship between the CAISO, the EIM entity and electric utilities located in an EIM entity balancing authority area that own a distribution or transmission system and meet the requirements set forth by the CAISO for EIM participation as an EIM sub-entity. It created rules around EIM sub-entity's forecasting, base-schedule submission, telemetry, network model maintenance, metering, outage reporting, and settlement and onboarding for the purposes of accurate and separate scheduling and settlement of an EIM sub-entity's load and non-participating resources.

6.2 Energy Storage Enhancements (I, C, 2)

The purpose of this initiative is to explore and develop enhancements to existing market rules, bidding parameters, optimization algorithm, and post market processes as applied the energy storage resources. This initiative will also develop market based mechanism(s) to replace of the Minimum State of Charge Requirement developed and implemented as part of the Resource Adequacy Phase 1, that will enable the ISO to procure and compensate resources for providing energy to ensure the ISO can maintain reliability over critical periods.

6.3 Maximum Import Capability Enhancements (I, C, N/A)

Through this initiative, the CAISO will discuss stakeholder concerns, raised during the maximum import capability stabilization and multi-year allocation initiative completed in 2020, about potential improvements to the calculation of maximum import capability and the process used to allocate and track it during the resource adequacy process.

6.4 Load, Export, & Wheeling Priorities Phase 2 (C, N/A)

This initiative includes a) the development of a process that would permit wheel-through transactions to reserve import capability and transmission across the CAISO system, and b) the associated review of wheel-through priorities when accessing the CAISO system. This initiative will also 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. 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.

6.5 Resource Adequacy Enhancements Phase 2 (I, C, N/A)

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:

- Resource Adequacy capacity valuation rules that properly reflect resource availability through forced outage rates;
- Resource adequacy validation tools and portfolio assessment to ensure the shown RA fleet satisfies both capacity and energy needs in all hours;
- Must offer obligation (MOO) and bid insertion modifications to minimize exemptions and ensure resources are offered into the market to meet their RA obligations;
- RA import provisions to ensure RA imports are backed by physical and verifiable capacity with high priority transmission service secured in advance;
- Planned outage process enhancements to ensure sufficient capacity is procured in advance to over expected planned outages; and,
- Enhancements to the flexible resource adequacy capacity construct to ensure sufficient resources are procured with the right attributes to meet ramping and uncertainty needs given supply and demand variability.

6.6 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) 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 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.

6.7 Scarcity Pricing Enhancement and System Market Power Mitigation (C, 2)

As part of various recent stakeholder initiatives, stakeholders recommended the CAISO pursue a stakeholder initiative focused on enhancing its market's scarcity pricing provisions. The existing scarcity pricing mechanism increases energy and ancillary services prices when there are not enough bids to meet load and maintain reserves. A shortfall of this design in the real-time market is that it can only reflect scarcity prices when the market must procure incremental ancillary services in the fifteen-minute market. In addition, it cannot reflect scarcity in the 5-minute real-time dispatch because the market does not procure ancillary services in the 5-minute real-time dispatch. Another feature of the market that reflects supply shortages is the price at which the market relaxes the power balance constraint when there is not enough supply to meet demand. Stakeholders have suggested that this price should be different with varying levels of supply shortages. Recent energy shortages and associated prices in the CAISO real-time market have also emphasized the need for the CAISO to review and enhance its scarcity pricing provisions. Recent proposals related to system market power and the CAISO's offer caps focused on high prices based on resource costs only. This initiative will also examine the extent to which scarcity pricing is related to those designs as well.

Additionally, 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 initial 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. In 2020, the CAISO completed its real-time market system market power mitigation design. After careful consideration of stakeholder and MSC input, and in light of the August 2020 heat wave events, the ISO believes the SMPM initiative would be best implemented in concert with scarcity pricing measures. The CAISO plans to continue to design system market power mitigation measures as part of its Scarcity Pricing initiative beginning in mid-2021.

6.8 Ancillary Service Deliverability and Real-Time Re-optimization (C, 2)

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. 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.

6.9 EIM Resource Sufficiency Evaluation Enhancements (C, 2)

In the Market Enhancements for Summer 2021 Readiness initiative the CAISO committed to a comprehensive initiative to examine the design and implementation of the EIM's existing resource sufficiency evaluation. The initiative aims to clarify what constitutes as leaning, as well as what are appropriate consequences for a failure of the resource sufficiency evaluation. The initiative also plans to review the balancing, capacity, and flexible ramping tests to determine if any enhancements are necessary to ensure the test components achieve their stated objective.

6.10 Extended Day-Ahead Market (I, C, 1¹¹)

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.

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.

¹¹ 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.

The primary market design and policy considerations include:

6.10.1 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.

6.10.2 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.

6.10.3 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.

6.10.4 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.

6.10.5 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.

6.10.6 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.

6.10.7 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.

6.10.8 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.

6.10.9 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.

6.10.10 EIM and Day-Ahead Market System Market Power Mitigation

In the System Market Power Mitigation initiative, the CAISO proposed system market power mitigation measures for the CAISO balancing authority area in the real-time market. This initiative will develop policy for system market power mitigation for the wider Energy Imbalance Market footprint and expand the mitigation design to the Day-Ahead Market.

6.10.11 Full Network Model Expansion – Phase 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.

6.10.12 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.

6.11 Western 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.

6.12 Transmission Access Charge Structure Enhancements (C, N/A)

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 Q3 2021.

6.13 Hybrid Resource Evolution (C, 2)

In phase 1 and phase 2 of the Hybrid Resource initiative, the CAISO is worked to implement the hybrid resources policy to allow co-located and hybrid models to enable participation in the market for 2020 and 2021, respectively. The Hybrid Resource Evolution initiative will review the market rules in place for hybrid and co-located resources and may consider new market functionality to allow them to operate more effectively in the market. Today, there are relatively few storage resources (which the CAISO anticipates making up the majority of hybrid and co-located resources in the future) on-line, but many are expected to enter in the second half of 2020 and during 2021. This initiative will review operations data from actual experience with hybrid and co-located resource operation to inform future policy direction.

6.14 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.

6.14.1 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.

6.14.2 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 the hard energy bid cap (+\$2000/MWh) are not symmetrical. This results in under-scheduled load in the day-ahead market being potentially subject to real-time prices at the \$2,000/MWh hard energy 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.

6.14.3 Exceptional Dispatch Decremental Settlement (C, 2)

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.

6.14.4 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.

6.14.5 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 resources to comply with dispatch instructions.

6.15 Frequency Response Measures (F, C, 2)

This initiative will consist of a comprehensive examination of mechanisms for the CAISO balancing authority areas to continue to meet NERC/WECC frequency response requirements. This initiative is in response to an observed degradation in frequency response performance, potentially related to a changing resource mix within the CAISO BA area. Over the past few years, the CAISO has relied on procuring frequency response capabilities from other balancing authority areas to meet NERC/WECC frequency response requirements.

Initially, the CAISO plans to complete an analysis of its current frequency response capabilities. This will consist of reviewing the CAISO balancing authority area's nominal frequency response capabilities compared to its actual frequency response during recent applicable events. For each of these events, it will quantify the response of each individual governor-enabled resource, evaluate each resources performance against expected response and will examine potential reasons and recommend corrective actions for instances of under-response. In addition CAISO plans to review the capability of variable energy and storage resources in meeting these reliability needs.

Based on this analysis, the CAISO plans to initiate a stakeholder process to develop any additional needed mechanisms to continue to meet NERC/WECC frequency response requirements. Potential options include the continuation of transferred frequency response, inclusion in a frequency response sharing group, or a market frequency response product targeting all frequency responsive resources potentially in the form of:

- Reservation of unloaded frequency responsive capacity,
- Reservation of frequency response capacity via additional regulation,

- Reservation of frequency response capacity via a fast regulation or fast frequency response product,
- Mechanisms to ensure the market commits sufficient inertial resources, and
- Products for interruptible demand to provide frequency response.

Any adopted solution may potentially include one or more of these mechanisms.

Finally, this initiative may examine enhancements to the CAISO's "pay-for-performance" regulation product. 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 potentially 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.

6.16 Joint Owned Unit Model (C, 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.

6.17 Storage as a Transmission Asset (SATA) (C, N/A)

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. The CAISO may restart this initiative in 2022 after completion of Energy Storage Enhancements and RA Enhancements, which are required to provide sufficient tools and policies to preserve and manage state of charge.

6.18 Multi Greenhouse Gas Area (C, 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.

7 Discretionary Initiatives

7.1 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.¹²

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.¹³

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 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.¹⁴

7.1.1 FERC Order 2222 (D, 2)

In September 2020, FERC issued Order 2222 to remove barriers preventing distributed energy resources (DERs) from competing on a level playing field in organized capacity, energy, and ancillary service markets run by ISO/RTOs. While there is likely little change needed to CAISO's DER Provider model, expressly cited by FERC as an example of what the Order requires of other ISO/RTOs, the CAISO is performing an in depth review of the order to determine what incremental changes might be needed for compliance. To date, this review has found only two

¹² <http://www.caiso.com/rules/Pages/BusinessPracticeManuals/Default.aspx>

¹³ Ibid.

¹⁴ <https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Market%20Operations>

substantial areas of compliance needed: 1) lowering the minimum DERA capacity requirement to 100 kW, and (2) enabling heterogeneous DERAs. If these or any other areas of compliance are found to significantly impact the current DERA participation model requirements, a stakeholder process might be initiated in the development of additional tariff provisions needed.

7.1.2 Curtailment Prioritization for Deliverable Projects (D, N/A)

This initiative was submitted by First Solar, Inc. in July 2020. Generation projects that are designated as Energy-Only have the same priority in the real-time market as resources with Full Capacity Deliverability Status that must comply with must-offer obligations. First Solar requests the CAISO create distinct market dispatch priorities for curtailment based on deliverability status. First Solar suggests aligning curtailment and deliverability may be an effective method to incentivize transmission investment, and clarify how deliverability statuses impact interconnection customers that choose to fund the upgrades to avoid excessive curtailment.

7.1.3 Variable Energy Resources Providing Ancillary Services (D, N/A)

This initiative was added to the catalog by the CAISO in July 2020. In 2019, the CAISO certified a solar photovoltaic resource for spinning reserve. The CAISO continues to work with the scheduling coordinator and owner of the resource to ensure the CAISO's market systems and forecasting practices accurately account for any spinning reserve awards the resource receives. This initiative would explore potential refinements to its ancillary services rules to facilitate greater participation by intermittent resources in its ancillary services markets. The initiative would also explore how the ISO's market systems and forecasting practices can accommodate greater participation by intermittent resources in its ancillary services markets.

7.1.4 Real-Time Flexible Ramping Product Extended Horizon Enhancement (D, 2)

During the stakeholder process for the Flexible Ramping Product Refinements initiative, the Department of Market Monitoring suggested the CAISO enhance the real-time flexible ramping product to address uncertainty in net load forecasts over longer time horizons. The flexible ramping product design that was implemented in the real-time market to manage ramp capability to address uncertainty related to load and variable energy resources in both the real-time unit commitment (RTUC) process and the 5-minute real-time dispatch (RTD). The 15-minute market (FMM) is the second interval of RTUC and generates financially binding schedules. In the RTUC, the flexible ramping product requirement covers the differences between the 15-minute market FMM interval and the highest and lowest binding RTD interval for the same 15-minute time interval. This 15-minute requirement is included in all intervals of RTUC. This ensures that there is sufficient ramp capability committed to clear RTD. This initiative would explore enhancing the design of the flexible ramping product by increasing the uncertainty requirement to cover larger uncertainty that can occur over an hour or longer than the current approach which includes a 15-minute or 5-minute requirement used in each of the advisory intervals in the real-time market.

7.1.5 De-commitment of EIM Base Schedule Short Start Units (D, 1)

This initiative was submitted by Arizona Public Service in February 2020. This initiative would explore the possibility of allowing the EIM to not start quick-start resources that are base

scheduled by EIM Entities, if it is economical to do so while still maintaining the capacity to be called upon due to the fast-start nature if required.

7.1.6 Bid Cost Recovery and Fifteen Minute Market Start-ups (D, 2)

This initiative was added to the catalog by the CAISO in July 2020. This potential initiative would explore a narrow change to the bid cost recovery rules for the real-time market. This issue has arisen from market participant questions regarding resource settlement in a specific circumstance. This circumstance is when the fifteen-minute market issues a start-up instruction and energy schedule to a resource and then the next run of the real-time pre-dispatch shuts down the resource. This can occur because the fifteen-minute market is based on the second fifteen-minute interval of each real-time pre-dispatch run, so the real-time pre-dispatch can shut down a fast start resource started in the fifteen-minute market prior to the five-minute real-time dispatch. In this situation, CAISO settlements pays the resource for its fifteen-minute market schedule and charges the resource for negative energy imbalances in the five-minute real-time dispatch. The resource will incur a net charge in settlements if five-minute real-time dispatch prices are greater than the fifteen-minute market prices. Bid cost recovery makes the resource whole for this loss for its fifteen-minute market schedule above its minimum load. However, the current settlement rules do not apply bid cost recovery to the energy corresponding to the resource's minimum load because the settlement rules require resources committed by the real-time market to actually start to have their minimum load subject to bid cost recovery. This is different than the bid cost recovery rules for the day-ahead market, which account for minimum load energy if the real-time market instructs a resource committed by the day-ahead market not to start.

7.1.7 Pumped Storage with Multiple Pumping Levels (D, 2)

This initiative was added to the catalog by the CAISO in July 2020 following a request from CDWR. This potential initiative would explore enhancements to the market models to allow pumped storage units to participate using discrete pumping levels, rather than a single on/off or continuous dispatchable pumping level. This capability would allow aggregate pump storage resources with discrete pumping levels to expand their market participation and be dispatched within their operating ranges.

7.1.8 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 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.

7.1.9 Multi-Stage Generator Requirements (D, 2)

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.

7.1.10 California ISO to Market Participant Relationship Enhancement (D, 2)

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.

7.1.11 Exceptional Dispatch Revenue Treatment in Bid Cost Recovery (D, N/A)

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.

7.1.12 BAA Islanding of Internal Regions (D, 3)

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.

7.1.13 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.

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

1 – EIM GB Primary; 2 – EIM GB Advisory; 3 – EIM GB Hybrid EIM Driven; 4 – EIM GB Hybrid Not EIM Driven

7.1.14 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.

7.1.15 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.

7.1.16 Over/Under Scheduling Load Enhancements (D, 1)

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.

7.1.17 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.

7.1.18 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.

7.1.19 Multi-Day Unit Commitment (D, N/A)

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.

7.1.20 Ancillary Services Verification, Compliance Testing, and Auditing (D, N/A)

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.

Pacific Gas & Electric also 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. 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 also examine current disqualification rules and consider what level is appropriate for a resource to pass the ancillary service test.

7.1.21 Regulation Service Real-Time Energy Make Whole Settlement (D, N/A)

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.

7.1.22 Fractional Megawatt Regulation Awards (D, N/A)

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.

7.1.23 Multi-Stage Generator Regulation Refinements (D, N/A)

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.

7.1.24 Allowing Convergence Bidding at CRR Sub-Load Aggregation Points (D, N/A)

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.

7.1.25 Implement Point-to-Point Convergence Bids (D, N/A)

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.

7.1.26 Review of Convergence Bidding Uplift Allocation (D, N/A)

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.

7.1.27 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.

7.1.28 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 Wheeling¹⁵

7.1.29 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.

7.1.30 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 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.

7.1.31 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

¹⁵ The Energy Imbalance Market Draft Final Proposal can be found at:
<https://www.westerneim.com/Documents/EnergyImbalanceMarket-DraftFinalProposal092313.pdf>

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.

7.1.32 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.

7.1.33 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.

7.1.34 Inter-Scheduling Coordinator Trade Adjustment Symmetry (D, N/A)

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.

7.1.35 Extending the submission deadline for Real-time Inter-SC trades (D, N/A)

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.

7.1.36 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.

7.1.37 Marginal Loss Surplus Allocation Approaches (D, N/A)

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.

7.1.38 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.

7.1.39 Integrated Optimal Outage Coordination – Phase 2 (D, 2)

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.

7.1.40 Rescheduled Outages (D, 2)

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.

7.1.41 Aggregated Pumps and Pumped Storage (D, 2)

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.

7.2 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.

7.2.1 Long-Term Congestion Revenue Rights (D, N/A)

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.

7.2.2 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.

7.3 Resource Adequacy

The CAISO is working to enhance its resource adequacy policies, processes, and rules that ensure sufficient resources are available to meet the system’s capacity and energy needs in the right places and with the right capabilities all hours of the year.

7.3.1 Multi-Year Resource Adequacy (D, N/A)

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.