



California Independent
System Operator Corporation

April 28, 2021

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: California Independent System Operator Corporation
Docket No. ER21- ____-000**

**Tariff Amendment to Implement Market Enhancements for
Summer 2021 – Load, Export, and Wheeling Priorities**

Dear Secretary Bose:

The California Independent System Operator Corporation (CAISO) submits this tariff amendment filing to revise load, export, and wheeling through priorities in the day-ahead and real-time market optimization processes and establish related market rules.¹ The proposed tariff revisions arise from root cause analyses of the controlled load shed events in August 2020 and CAISO discussions with stakeholders in the Market Enhancements for Summer 2021 Readiness stakeholder initiative.² They reflect market rule and other process enhancements feasible for the CAISO to implement by summer 2021. The proposed tariff revisions, with other actions the CAISO and state agencies are undertaking, will better position the CAISO to maintain reliable grid operations in summer 2021. The proposed tariff revisions are critical to ensure that, during constrained conditions, the CAISO can manage transactions at the interties and

¹ The CAISO submits this filing pursuant to Section 205 of the Federal Power Act (FPA), 16 U.S.C. § 824d. Capitalized terms not otherwise defined herein have the meaning set forth in the CAISO tariff, and references to specific sections, articles, and appendices are references to sections, articles, and appendices in the current CAISO tariff and as revised or proposed in this filing, unless otherwise indicated.

² These constitute the second set of tariff revisions arising from the CAISO's Market Enhancements for Summer 2021 Readiness initiative. The CAISO filed the first set of tariff revisions on March 26, 2021 in Docket No. ER21-1536-000.

internal transmission paths reliably and fairly to meet its native load obligations and provide access to external entities that also will be relying on the CAISO grid to serve their load. Accordingly, the Commission should approve the proposed tariff revisions expeditiously.

To address the risks the CAISO faces in summer 2021, the proposed tariff revisions must become effective in July. The CAISO respectfully requests the Commission issue an order by June 27, 2021, accepting the proposed tariff revisions effective on the dates the CAISO proposes.

The CAISO is submitting three sets of tariff revisions with different effective dates. The first set, consisting of a new defined term Priority Wheeling Through and an eligibility notification provision, will become effective June 28, 2021.³ The second set, which contains the other load, export, and wheeling through related tariff revisions, will become effective no later than July 15, 2021.⁴ The CAISO requests authorization to notify market participants of the effective date of the second set of tariff changes at least five days before implementation.⁵ The earliest date these tariff changes would be effective on five days' notice is July 3, 2021, assuming the Commission issues an order on June 27, 2021, and the CAISO issues a notice on June 28, 2021. Because the CAISO intends all wheeling through related tariff revisions to be interim only, the CAISO is submitting a third set of tariff records that removes the new wheeling through provisions from the CAISO tariff effective June 1, 2022.⁶ The CAISO requests the Commission waive its notice requirement to allow the June 1, 2022 effective date for these tariff revisions.

From a substantive perspective, the proposed tariff revisions regarding export priorities and related market rules are discrete and stand on their own

³ The clean tariff sheets for the first set of tariff revisions that would become effective June 28, 2021 are in Attachment A, and the redlined tariff sheets are in Attachment B.

⁴ The clean tariff sheets for the second set of tariff revisions that would become effective no later than July 15, 2021 are in Attachment C, and the redlined tariff sheets are in Attachment D. A June 27, 2021 order will provide the CAISO and market participants with sufficient time to prepare to implement these changes.

⁵ The CAISO has included an effective date of 12/31/9998 as part of the tariff records submitted for the second tranche of tariff revisions. The CAISO will notify the Commission of the actual effective date of these tariff records within five business days after their implementation in an eTariff submittal using Type of Filing code 150 – Report. See *Cal. Indep. Sys. Operator Corp.*, 172 FERC ¶ 61,263, at Ordering Paragraphs (A) and (C) (2020).

⁶ The clean tariff sheets for the third set of tariff revisions that would become effective June 1, 2022 are in Attachment E, and the redlined tariff sheets are in Attachment F.

from the tariff revisions regarding wheeling through self-schedule priorities (and related revisions).⁷ The tariff revisions in each category are separate elements of a multi-part filing severable from the tariff revisions in the other category. They are not interrelated, interdependent, or affected by Commission action on tariff revisions in the other category. The Commission should evaluate the justness and reasonableness of the export and wheeling through related tariff revisions on their individual merits. Mere rejection of one proposed set of tariff revisions should not per se require rejection of the other set of tariff revisions.

It is critical the CAISO implement the proposed tariff provisions by early July before summer peak loads are likely to occur. If the Commission believes it needs more information to assess a particular tariff revision, the Commission should either reject the specific tariff revision or issue a deficiency letter only for it. The CAISO respectfully requests the Commission issue an order accepting the remaining tariff revisions.

I. EXECUTIVE SUMMARY

A heat wave affected the western United States for several consecutive days in mid-August 2020, causing energy supply shortages that led to two controlled rotating power outages in the CAISO footprint on August 14 and 15. The CAISO, California Public Utilities Commission (CPUC), and California Energy Commission (CEC) then undertook a root cause analysis of these events, and the CAISO Department of Market Monitoring (DMM) separately issued a report on CAISO market performance during the events. The CAISO subsequently initiated an expedited stakeholder process to consider market enhancements necessary to prepare for potential extreme weather events and tight supply conditions in summer 2021. The proposed tariff revisions arise from these efforts. They establish needed scheduling priorities for load, export, and wheeling through transactions in the day-ahead and real-time market optimization processes and related market rules that will produce fairer, more reliable market outcomes. Importantly, they CAISO can implement these rules by summer 2021.

The proposed enhancements are vital to maintaining reliability and avoiding load shedding this summer during severely constrained conditions. They fairly balance the reliability of serving CAISO balancing authority area (BAA) load (*i.e.*, native load) with the reliability of export and wheeling through transactions, while providing open access to the CAISO system.

⁷ As discussed further below, the individual tariff revisions within each of the two categories of tariff revisions generally are discrete and severable.

First, the CAISO proposes two changes to the scheduling priorities for self-scheduled⁸ exports in the real-time market optimization:

- Low-priority recallable exports⁹ that are awarded day-ahead market schedules will have a lower priority than CAISO load in the real-time market;¹⁰ and
- Low-priority recallable exports deemed feasible in the residual unit commitment (RUC) process and self-scheduled into the real-time market will receive a priority higher than new low-priority recallable exports bidding into the real-time market.

Both changes reinforce the CAISO's ability to recall resource adequacy (RA) Capacity¹¹ when the system is constrained, and the CAISO must utilize its RA Capacity to meet internal load. The first proposed change to the scheduling priority for self-scheduled exports is critical to (1) ensure the CAISO can use capacity contracted by CAISO load serving entities (LSEs) to meet CAISO BAA needs in the first instance, and (2) ensure market processes appropriately curtail low-priority recallable exports supported by RA Capacity when necessary. Under today's rules, a low-priority recallable export scheduled in the day-ahead market has a higher priority than CAISO load in the real-time market. This creates the possibility the market will use RA Capacity intended to serve CAISO internal load to instead support low-priority recallable exports. The CAISO's proposal removes this unintended and unjustifiable outcome and further aligns the market

⁸ A self-schedule is a market bid a scheduling coordinator submits to the CAISO that indicates a quantity in MWhs but does not specify a price. This indicates the scheduling coordinator is a price-taker. Essentially, self-schedules are requests the market schedule the transaction irrespective of the market price. In the real-time market, self-schedules are also day-ahead market schedules for which the market participant has not re-submitted an economic bid. Bids in the CAISO markets include priced offers and self-schedules.

⁹ The CAISO tariff refers to low-priority recallable exports as "Self-Schedules of exports not explicitly sourced by non-Resource Adequacy Capacity." See existing tariff section 31.4. For the sake of clarity, this transmittal letter distinguishes between existing tariff sections (*i.e.*, sections in the current CAISO tariff), new tariff sections (*i.e.*, new sections the CAISO proposes to add to the tariff in this filing), and revised tariff sections (*i.e.*, existing tariff sections the CAISO proposes to revise in this filing).

¹⁰ High-priority non-recallable exports, have the same priority as self-scheduled CAISO load and a higher priority than low-priority recallable exports. The CAISO tariff refers to high-priority non-recallable exports as "Self-Schedules of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity." See existing tariff section 31.4.

¹¹ The CAISO tariff defines RA Capacity as "the supply capacity of a Resource Adequacy Resource listed on a Resource Adequacy Plan and a Supply Plan." A Resource Adequacy Resource is "a resource designated on a Supply Plan to provide Resource Adequacy Capacity."

rules with Commission precedent that exports supported by CAISO RA Capacity are essentially recallable opportunity sales.

The second proposed change for self-scheduled exports ensures that exporters procuring resources to serve their load in the day-ahead timeframe have a higher priority than those that do not. Similarly, CAISO native load will have a higher priority than real-time low-priority recallable exports. The change encourages forward scheduling of low-priority recallable exports, which allows the CAISO to set schedules that are more reliable in the day-ahead. The proposed export priority revisions do not disturb existing tariff rules providing high-priority non-recallable exports the same priority as the CAISO's native load.

Second, the CAISO proposes several new rules and requirements regarding the capacity that can support high-priority non-recallable exports:

- Capacity supporting a high-priority non-recallable export must be forward contracted only with an external LSE;
- Capacity supporting high-priority non-recallable exports must be available and physically capable of sustaining the high-priority non-recallable export quantity for the entire hourly block;
- Capacity supporting a high-priority non-recallable export must be deliverable;
- Only resources internal to the CAISO can support a high-priority non-recallable export, distinguishing such exports from wheeling through transactions;
- In case a supporting resource does not receive a schedule in the integrated forward market (IFM) equal to or greater than the corresponding high-priority non-recallable export, the supporting resource must submit a \$0/MW RUC availability bid up to the export self-scheduled quantity; and
- Resources must submit real-time market bids for the quantity of the high-priority non-recallable export they are backing in order for the export to be high-priority.

These bidding and behavioral rules will better ensure capacity supporting high-priority non-recallable exports (1) is not otherwise contracted with a CAISO LSE (*i.e.*, the capacity is committed solely to an external LSE), and (2) is available and physically capable of meeting its schedule so capacity procured to

serve CAISO native load does not support the export. Requiring scheduling coordinators to bid capacity supporting a high-priority non-recallable export in the real-time market will ensure there is sufficient non-RA generation to support the high-priority non-recallable export. This addresses a problem with the CAISO's current market design whereby an export receiving a RUC schedule automatically has a priority higher than CAISO load in real-time, even if the resource originally supporting the export no longer is available, and no specific replacement resource is made available to support the export in real-time. The RUC participation and \$0/MWh RUC availability bid requirements ensure RUC considers RA Capacity and non-RA Capacity equally when determining the resources needed to meet the overall CAISO demand forecast (which includes both CAISO internal load and exports). Otherwise, resources designated to support high-priority non-recallable exports could bid high in the IFM to avoid serving their share of overall demand, forcing the CAISO to serve the high-priority non-recallable exports from its system pool of resources, which includes RA Capacity procured to serve CAISO load.

Third, the CAISO proposes tariff revisions to facilitate the allocation of derated capacity when only a portion of a resource's capacity is RA Capacity. Today, the CAISO only knows whether the capacity of a derated resource is RA or non-RA. Scheduling coordinators for resources do not advise the CAISO whether non-RA Capacity is unsold capacity, capacity sold to a CAISO LSE but not shown on a monthly RA Plan, or capacity sold to an external LSE for export. Thus, the CAISO does not know exactly how it should allocate any derated capacity among the various categories of a unit's capacity or the extent to which a derated resource can support a high-priority non-recallable export. To address this situation, the CAISO proposes to require scheduling coordinators requesting planned outages or notifying the CAISO of forced outages that partially derate a resource to advise the CAISO of the extent the outage affects RA Capacity and any contracted non-RA Capacity. The CAISO will allocate derates between RA Capacity and the various categories of non-RA Capacity based on the scheduling coordinator's guidance to the CAISO and determine RA Substitute Capacity requirements. Thus, the proposal will allow the CAISO to obtain the information necessary to allocate capacity derates properly and effectively among the various types of capacity. This will enable the CAISO to accommodate prorated high-priority non-recallable export exports following unit derates.

The CAISO's final set of changes addresses wheeling through self-schedule priorities. The CAISO worked hard with stakeholders and put in a painstaking effort to address this complex, challenging, and polarizing issue. The CAISO sought to develop a solution for summer 2021 that effectively balances the needs of both the CAISO's native load customers and external entities seeking to use the CAISO system to serve their load. Over the course of the underlying stakeholder initiative, the CAISO evolved its proposal to respond to stakeholder concerns. It was challenging to find a balanced approach for this

summer consistent with general open access principles, but the CAISO believes its proposal achieves that objective.

To address the effects wheeling through transactions can have on the CAISO's ability to meet its native load obligations, the CAISO proposes, on an interim basis, through May 31, 2022, to establish two categories of wheeling through self-schedule transactions – a Priority Wheeling Through and a non-Priority Wheeling Through. Priority Wheeling Through transactions will have a priority equal to CAISO load and high-priority non-recallable exports in the day-ahead and real-time market optimization processes. Non-Priority Wheeling Through transactions will have a lower priority. If the market exhausts economic bids, the market optimization may have to adjust self-schedules based on the scheduling priorities in the tariff. Scheduling priorities are a factor when the market cannot find a feasible solution. This occurs when there is insufficient supply to meet overall demand on the CAISO grid, including exports, or transmission constraints are binding in the CAISO BAA such that economic bids alone cannot resolve them. The market adjustment process, which uses parameters, is necessary to adjust import schedules and wheeling through transactions to apportion transmission capacity fairly when the system is constrained and the CAISO is at risk of not serving its load. When an Intertie is constrained in the import direction by a scheduling limit or Path 26 is constrained in the north-south direction, and HASP cannot meet CAISO Forecast of CAISO Demand or fully accommodate a Priority Wheeling Through transaction, the CAISO proposes to perform a process after the hour-ahead scheduling process (HASP) to allocate available transmission capacity *pro rata* between supply needed to meet CAISO load and Priority Wheeling Through transactions.

The existing CAISO tariff does not specify the scheduling priorities for wheeling through transactions (except those associated with Existing Transmission Contracts and Transmission Ownership Rights). However, the parameters in the market software, in combination with the wheeling through constraint that ensures the import and export side of the wheeling through transaction remain equal, effectively provide wheeling through transactions that clear the day-ahead market a higher priority than CAISO load. Although the CAISO did not observe consequential wheeling through transactions during last summer's load shed events, it expects increased wheeling through transactions this summer, which would displace RA imports under the current parameter settings. The proposed tariff revisions are necessary to avoid wheeling through self-schedules "crowding out" both RA imports using the interties and RA Capacity from northern California generation that must flow north-to-south on Path 26 to serve load elsewhere in California. Increased wheeling through transactions potentially can prevent the CAISO from serving its native load even from internal RA resources built to serve CAISO load and paid for by CAISO LSEs. This is untenable, and it could cause load shedding if not addressed.

One of the core elements of the Commission's open access policies is the ability of transmission providers to include in their tariffs protections to ensure reliable service to native load customers. Other ISOs and RTOs reserve capacity to allow for reliable service to native load customers. This includes mechanisms for reserving capacity for native load as an existing transmission commitment in their available transfer capability (ATC) calculations and setting aside a capacity benefit margin (CBM) to access generation during contingencies. Also, many ISOs and RTOs, and most other transmission providers, provide non-firm transmission from transfer capability exceeding that needed to provide reliable service to native load and firm service customers. The CAISO has included none of these native load protections in its tariff. Although it is infeasible for the CAISO to adopt CBM, changes to ATC calculations, multiple categories of transmission service, or other approaches it considered in time for summer 2021, the CAISO's interim proposal provides comparable protections to its native load customers.

Lacking a transmission reservation mechanism that would protect CAISO native load when the system is constrained, the CAISO instead proposes an interim measure that would establish the two categories of priorities for wheeling through self-schedule transactions – a Priority Wheeling Through and a non-Priority Wheeling Through. The CAISO proposes to define a Priority Wheeling Through transaction as a wheeling through self-schedule supported by (1) a firm power supply contract to serve an external LSE's load for the entire calendar month, and (2) and monthly firm transmission from the source to the CAISO border for Hours Ending 07:00 through 22:00, Monday through Saturday excluding North American Electric Reliability Corporation (NERC) holidays. All other wheeling through self-schedules are non-Priority Wheeling Through transactions. The scheduling coordinator for the Priority Wheeling Through transaction must notify the CAISO it meets the eligibility requirements 45 days before the month. This aligns with the deadline for CAISO LSEs to submit their monthly RA Plans showing the RA Capacity they have procured to meet their monthly RA obligations. The firm transmission hours align with NERC, North American Energy Standards Board (NAESB), and other definitions of peak period transmission.

The proposed requirements demonstrate that an external entity wheeling through the CAISO depends on and is committed to using the CAISO transmission system regularly to serve its load similar to CAISO LSEs' dependence on using the system to meet their customer needs. When the Commission accepted the CAISO's current nodal market, it recognized that because external LSEs are situated differently than internal load regarding the extent of their reliance on the CAISO grid, it was appropriate to require them to demonstrate their intention to utilize the CAISO transmission system regularly in order to receive rights comparable to those available to internal load. Specifically, the Commission approved allocating Congestion Revenue Rights

(CRRs) to CAISO LSEs, but external LSEs had to prepay transmission access charges to receive a CRR allocation. The same principles support the CAISO's proposal.

Establishing priorities for wheeling through self-schedules vis-à-vis CAISO native load self-schedules was contentious, and stakeholders were deeply divided. Even after the CAISO revised its proposal numerous times to address stakeholder feedback, there was no widespread consensus. Many stakeholders oppose the wheeling through priority proposal in whole or in part – with some arguing it does not sufficiently protect wheeling through self-schedules and others arguing the CAISO has not gone far enough to reserve capacity to provide reliable service to native load customers.

The CAISO believes its interim solution is fair, balanced, and just and reasonable, particularly given the polarized views of some stakeholders. It offers reasonable native load protections, while recognizing certain external BAAs may be relying on wheeling through transactions to serve their native load this summer. Recognizing stakeholder concerns and that the proposed tariff revisions arise from an expedited stakeholder process, the CAISO proposes to sunset the wheeling through related tariff revisions effective May 31, 2022. For the next year, the interim approach allows the CAISO both to fulfill its obligations to provide reliable service to native load and to accommodate external LSEs that have entered into supply arrangements with the expectation they could rely on wheeling through the CAISO. It also provides needed time for the CAISO to work closely with stakeholders to develop a more durable solution.

Some stakeholders argue the CAISO's proposal violates open access. It does not. The proposal is consistent with general open access principles, including the native load priority articulated in Order Nos. 888 and 890. These stakeholders ignore that under the CAISO's proposal, the CAISO grid will remain "open" to all market participants that seek to use it, just as it is today. On a daily basis, any scheduling coordinator – whether it represents supply, load, exports, or wheeling through transactions – can submit a bid/self-schedule for service. The CAISO's proposal merely establishes the scheduling priorities the CAISO will apply in the day-ahead and real-time market optimization processes during extremely tight conditions if the market does not solve and it needs to adjust self-schedules. Scheduling priorities for other self-schedules already exist in tariff, but the tariff does not reference the priorities for wheeling through transactions. The CAISO proposes to specify them now because it is proposing to create two classes of wheeling through self-schedules with different priorities.

Prioritizing only those wheeling through self-schedules where the external entity demonstrates it depends on using the CAISO grid similar to CAISO LSEs is fair, consistent with the Commission's open access principles, and effectively balances the CAISO's need to meet native load obligations with the desire of

other entities to obtain transmission service from the CAISO. It is just and reasonable for customers engaging in non-Priority Wheeling Through transactions to have a lower priority because they have not demonstrated the same long-term supply arrangements and dependence on using the CAISO grid as native load or Priority Wheeling Through customers. The proposed priorities will reduce the need to shed native load when the interties or internal transmission paths from north to south are severely constrained.

Other transmission providers address curtailment-related issues through measures such as CBM, reservation of capacity for native load as existing transmission commitments, different categories of transmission service with different curtailment priorities, and NERC Transmission Loading Relief standards.¹² Energy sellers (including the merchant arms of regulated public utilities) similarly implement varying curtailment/supply interruption provisions in their sales contracts, distinguishing between firm and non-firm energy, which they may interrupt or recall for any number of reasons, including reliability or economics. The CAISO's proposed measures are comparable in effect, but not identical in form, to the native load protections maintained by other ISOs, RTOs, and transmission providers. The CAISO's proposal reflects the unique nature of its services and markets – no transmission reservations, no classes of transmission service, and a volumetric wheeling through rate. The CAISO handles all scheduling priorities through the penalty parameters in the market optimization. The CAISO's proposal merely establishes the relative priority of native load and other transmission system uses through a scheduling priority based on the market's application of penalty prices. In other words, it does not foreclose access to the CAISO system; it simply, and reasonably, sets the priorities if the CAISO must adjust self-schedules because there is insufficient supply or transmission capacity to meet all service requests. In particular, it ensures those external entities that have demonstrated they are relying on the CAISO grid regularly to serve their native load will have equal priority to CAISO native load, and a scheduling priority higher than other wheeling through transactions.

In summary, the CAISO's tariff enhancements provide a just and reasonable approach to maintaining reliability and avoiding load shedding this summer during severely constrained conditions. To address the challenges the CAISO faces in summer 2021, the CAISO respectfully requests the Commission issue an order accepting the tariff enhancements by June 27, 2021.

¹² In addition, as discussed above, other transmission providers “carve-out” and preserve capacity for native load before even making capacity available for other transmission service.

II. BACKGROUND

A. Summer 2020 Heat Events

During August 14-19, 2020, California experienced statewide extreme heat with temperatures 10-20 degrees above normal. The rest of the west also experienced record or near record highs with forecasts ranging from five to 20 degrees above normal. This west-wide heat wave significantly affected demand for and supply of generation. On August 14 and 15, 2020, the CAISO was forced to institute rotating electricity outages. On August 14, the CAISO ordered two phases of controlled load shed of 500 MW each, based on a *pro-rata* share across the CAISO footprint for distribution utility companies. On August 15, the CAISO ordered distribution utility operators to execute about 500 MW of controlled load shed on their respective distribution systems.

From August 16 through 19, the forecast was for excessive heat in California. During this period, various portions of the western region cooled off, and imports increased on those days. The most critical days were Monday, August 17, and Tuesday, August 18, and the CAISO declared Stage 2 Emergencies for both days. However, the CAISO avoided controlled load shed and rotating outages.

On August 16, Governor Newsom declared a State of Emergency¹³ because of the extreme heat wave in California and surrounding western states. The proclamation gave the California Air Resources Board maximum discretion to permit the use of stationary and portable generators and auxiliary ship engines to reduce load and increase generation. On August 17, Governor Newsom issued Executive Order N-74-20,¹⁴ which suspended restrictions on the amount of power facilities could generate, the fuel they could use, and the air quality requirements that prevented facilities from generating additional power during peak demand periods. Because of the conservation messaging and awareness created by the State of Emergency, the state reduced peak demand by as much as 4,000 MW (compared to day-ahead forecasts) on August 17 through 19.

In addition to the extreme heat wave in mid-August, the CAISO footprint experienced another period of high temperatures and demand over the 2020 Labor Day weekend, specifically on Sunday, September 6, and Monday, September 7. Similar to August 17-19, there was considerable conservation from the public, and the CAISO did not need to shed load.

¹³ <https://www.gov.ca.gov/wp-content/uploads/2020/08/8.16.20-Extreme-Heat-Event-proclamation-text.pdf>.

¹⁴ <https://www.gov.ca.gov/wp-content/uploads/2020/08/8.17.20-EO-N-74-20.pdf>.

B. Root Cause Analysis

Following the summer 2020 heat wave events, the CAISO, CPUC, and CEC undertook a root cause analysis of the events leading to the outages. They published a Preliminary Root Cause Analysis on October 6, 2020¹⁵ and a Final Root Cause Analysis on January 13, 2021.¹⁶ The Final Root Cause Analysis identified three major causal factors contributing to the August outages—extreme weather conditions, RA and planning processes, and market practices.¹⁷ In summary, these factors were:

1. *The climate change-induced extreme heat wave across the western United States resulted in demand for electricity exceeding existing electricity resource adequacy (RA) and planning targets.* The extreme heat wave experienced in August 2020 was a 1-in-30 year weather event in California. In addition, because the extreme heat wave extended across the western United States, resources in neighboring areas were also strained.
2. *In transitioning to a reliable, clean, and affordable resource mix, resource-planning targets have not kept pace to ensure sufficient resources that can be relied upon to meet demand in the early evening hours. This made balancing demand and supply more challenging during the extreme heat wave.* The rotating outages both occurred after the gross peak demand period, during the “net demand peak,” which is the peak of demand net of solar and wind generation resources. With today’s new resource mix, behind-the-meter and front-of-meter (utility-scale) solar generation declines in the late afternoon at a faster rate than demand decreases. These changes in the resource mix and the timing of the net peak have increased the challenge of maintaining system reliability, and this amplifies the challenge during an extreme heat wave.

¹⁵ CAISO, CPUC, and CEC, *Preliminary Root Cause Analysis Mid-August 2020 Heat Storm* (Oct. 6, 2020) (Preliminary Root Cause Analysis). The Preliminary Root Cause Analysis is available at <http://www.caiso.com/Documents/Preliminary-Root-Cause-Analysis-Rotating-Outages-August-2020.pdf>.

¹⁶ CAISO, CPUC, and CEC, *Final Root Cause Analysis Mid-August 2020 Extreme Heat Wave* (Jan. 13, 2021) (Final Root Cause Analysis), available at <http://www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>.

¹⁷ *Id.* at 3-5.

3. *Some practices in the day-ahead energy market exacerbated the supply challenges under highly stressed conditions.*¹⁸ A subset of energy market practices contributed to the inability to obtain or prioritize energy to serve CAISO load in the day-ahead market that could have otherwise relieved the strained conditions on the CAISO grid on August 14 and 15. The practices that obscured the tight physical supply conditions included under-scheduling of demand in the day-ahead market by LSEs or their scheduling coordinators and convergence bidding reflecting financial supply positions. In addition, the combination of existing real-time scheduling priorities and a previously implemented market enhancement inadvertently caused the CAISO's markets to fail to account for the obscuring effects of under-scheduling and convergence bidding during August's stressed operating conditions.

The Final Root Cause Analysis noted the CAISO, CPUC, and CEC had taken several actions, and were continuing their efforts, to prepare California for extreme heat waves in summer 2021 without having to resort to rotating outages. The Final Root Cause Analysis stated the near-term actions to prepare for summer 2021 included, among other actions:¹⁹

- 1) The CPUC opened an Emergency Reliability Rulemaking proceeding (R.20-11-003) to procure additional resources to meet California's electricity demand in summer 2021. Through this proceeding, the CPUC has already directed the state's three large investor-owned utilities to seek contracts for additional supply-side capacity and has requested proposals for additional demand-side resources that can be available during the net demand peak period (*i.e.*, the hours past the gross peak when solar production is very low or zero) for summer 2021 and summer 2022. The CPUC and parties to the proceeding, including the CAISO, will continue to evaluate proposals and procurement targets for both supply-side and demand-side resources.

¹⁸ The CAISO's DMM also issued a Report on *System and Market Conditions, Issues and Performance: August and September 2020* (DMM Report). The DMM Report is available at: <http://www.caiso.com/Documents/ReportonMarketConditionsIssuesandPerformanceAugustandSeptember2020-Nov242020.pdf>. The DMM Report found "there was no single root cause of the load shedding events occurring on August 14-15." DMM Report at 1. Rather, the load outages "resulted from the combined effect of a series of factors." *Id.* The DMM Report offered several recommendations to address potential resource shortages in future years.

¹⁹ Final Root Cause Analysis at 1-3.

- 2) The CAISO is continuing to perform analysis supporting an increase to the CPUC's RA program procurement targets. Based on the analysis to date, the CAISO recommends that the targets apply to both the gross peak and the critical hour of the net demand peak period during the months of June through October 2021.
- 3) The CAISO is expediting a stakeholder process to consider market rule and practice changes by June 2021 that will ensure the CAISO's market mechanisms accurately reflect the actual balance of supply and demand during stressed operating conditions. This initiative will consider changes that incentivize accurate scheduling in the day-ahead market, appropriate prioritization of export schedules, and evaluate performance incentives and penalties for the RA fleet. The CAISO is also working with stakeholders to ensure the efficient and reliable operation of battery storage resources given the significant amount of new storage that will be on the system next summer and beyond. Through a stakeholder process, the CAISO will pursue changes to its planned outage rules.
- 4) The CPUC is tracking progress on generation and battery storage projects that are currently under construction in California to ensure there are no CPUC-related regulatory barriers that would prevent them from being completed by their targeted online dates. The CAISO will continue to work with developers to address interconnection issues as they arise.
- 5) The CAISO and CEC will coordinate with non-CPUC-jurisdictional entities to encourage additional necessary procurement by such entities.
- 6) The CEC is conducting probabilistic studies that evaluate the loss of load expectation on the California system to determine the amount of capacity that needs to be installed to meet the desired service reliability targets.
- 7) The CAISO, CPUC, and CEC are planning to enhance the efficacy of Flex Alerts to maximize consumer conservation and other demand side efforts during extreme heat events.
- 8) Preparations by the CAISO, CPUC, and CEC are underway to improve advance coordination for contingencies, including communication protocols and development of a contingency plan. The contingency plan will draw from actions taken

statewide under the leadership of the Governor's Office to mitigate the anticipated shortfall from August 17 through 19, 2020.

The proposed tariff amendments arise from the stakeholder initiative referenced in item #3 above as a current action to prepare for summer 2021.²⁰ Also, as referenced in item #3 above, in the CAISO's Resource Adequacy Enhancements stakeholder initiative, the CAISO and stakeholders considered changes to the planned outage rules and rules to ensure the availability of storage resources providing RA Capacity during periods of extreme need. On March 29, 2021, the CAISO made a Section 205 tariff amendment filing in Docket No. ER21-1551-000 to implement these RA-related enhancements.²¹

C. Market Enhancements for Summer 2021 Readiness Stakeholder Initiative

1. Stakeholder Process

On January 5, 2021, the CAISO formally commenced the Market Enhancements for Summer 2021 Readiness initiative by posting a presentation

²⁰ The Final Root Cause Analysis identifies other market rule enhancements the CAISO is considering in separate stakeholder processes, as well as CAISO, CPUC, and CEC efforts regarding resource planning and development, situational awareness, and contingency planning. Final Root Cause Analysis at 71-76. Several of these are mid-term and long-term efforts to explore changes that are not implementable by summer 2021. The Market Enhancements for Summer 2021 Readiness initiative focused on rule changes that were feasible and the CAISO could implement by summer 2021.

²¹ The CAISO also has been an active participant in the CPUC's Emergency Reliability Rulemaking proceeding referenced in the Final Root Cause Analysis. See *Order Instituting Rulemaking to establish Policies, Processes, and Rules to Ensure Reliable Electric Service in California in the Event of an Extreme Weather Event in 2021*, Rulemaking 20-11-003 (Filed Nov. 19, 2020). The CAISO recommended, *inter alia*, the CPUC take the following actions: (1) increase the planning reserve margin from 15 percent to 17.5 percent for the months of June through October 2021, (2) authorize incremental import procurement, (3) fund the Flex Alert paid advertising program, and (4) adopt an Emergency Load Reduction Program (ELRP) in addition to the RA program to provide insurance value during stressed system conditions. On February 11, 2021, the CPUC issued its first decision (Decision 21-02-028) in the proceeding authorizing the investor owned utilities (IOUs) to contract for (1) incremental capacity from existing power plants through efficiency upgrades, (2) generation at-risk of retirement, (3) incremental energy storage capacity, and (4) firm forward imports. All resources must be deliverable during both the peak and net peak demand periods. On March 25, 2021, the CPUC issued a second decision (1) retaining the existing 15 percent PRM but authorizing incremental procurement by the IOUs to be shown as RA Capacity, which would result in an implied PRM of 17.5 percent for 2021 and 2022, (2) approving funding for a statewide Flex Alert paid media campaign, and (3) approving an ELRP pilot program.

regarding the initiative.²² The CAISO noted the focus of the initiative was on market rules and procedural changes necessary to prepare the CAISO to manage heat events in summer 2021. The CAISO indicated it would file any necessary tariff changes by April, for June 2021 implementation. The presentation identified the initial topics the CAISO identified for consideration in the initiative as:

1. Export and load priorities²³
2. Reliability demand response resource dispatch and real-time price impacts
3. Requirements for storage resources during tight system conditions
4. Cost recovery provisions for hourly block imports during tight system conditions
5. Short term scarcity price enhancements
6. EIM coordination and resource sufficiency test review
7. Other items that can be vetted through stakeholder process and implemented by June 1

On January 6, 2021, the CAISO held a call with stakeholders to discuss the issues it had identified for consideration and the initiative schedule. The CAISO provided stakeholders an opportunity to submit written comments in response to the presentation.²⁴

The CAISO posted a straw proposal on January 25, 2021 and held a call with stakeholders to discuss it on January 26, 2021. The CAISO also held a follow-up call on January 29, 2021. The CAISO provided stakeholders an opportunity to submit written comments on the straw proposal.

The CAISO discussed its proposals at a Market Surveillance Committee (MSC) meeting on February 11, 2021. The CAISO posted a draft final proposal and an initial draft of proposed tariff language on February 18, 2021. The CAISO held a stakeholder call to discuss the draft final proposal on February 22, 2021

²² The record of the CAISO's Market Enhancements for Summer 2021 Readiness initiative, including all documents posted by the CAISO and submitted by stakeholders, is available at <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Market-enhancements-for-summer-2021-readiness>.

²³ During the stakeholder process, the CAISO severed consideration of the load, export, and wheeling through issues from the changes that were part of the CAISO's March 26, 2021 tariff amendment filing in Docket No. ER21-1536-000.

²⁴ The CAISO held a workshop on January 12, 2021 to discuss load and export priorities, as discussed in more detail in the next section of this transmittal letter, and a second workshop on January 13, 2021 to discuss EIM coordination and the resource sufficiency evaluation.

and a separate call to discuss the draft tariff language and business requirements associated with the proposed changes on February 26, 2021. The CAISO provided stakeholders an opportunity to submit written comments on both the draft final proposal and the draft tariff language. The CAISO posted revised tariff language on March 10, 2021 and held a call with stakeholders on March 18, 2021.

The CAISO posted a Final Proposal (and draft tariff language) on March 19, 2021 that included several revisions to the load, export, and wheeling priorities reflected in its Draft Final Proposal. Stakeholders had an opportunity to provide written comments on the Final Proposal. The CAISO posted revised tariff language on April 8, 2021. Based on stakeholder feedback and its own review, the CAISO posted a Revised Final Proposal on April 14, 2021.²⁵ The CAISO held a stakeholder call on April 14, 2021 to discuss the revisions to its Final Proposal and a stakeholder call on April 19, 2021 to discuss the revised tariff language.²⁶ The CAISO posted further revised tariff language on April 20, 2021.

At its April 21, 2021 meeting, the CAISO Board of Governors authorized the CAISO to file the tariff revisions in this filing.²⁷

2. Workshop on Load and Export Priorities

The CAISO recognizes its market functions in the broader western interconnection and seeks to ensure it will deliver exports comparable to other western BAAs. To understand other BAAs' practices better, the CAISO conducted a stakeholder workshop on January 12, 2021 to discuss its market's priorities for serving load relative to export schedules and other BAAs' practices. Idaho Power Company (Idaho Power) shared its practices as a representation of the general practices across the western interconnection.²⁸ Based on the Idaho Power presentation and accompanying discussion, other BAAs decide whether to honor export schedules relative to serving their own load depending on

²⁵ The Revised Final Proposal is Attachment G to this filing.

²⁶ The CAISO also provided stakeholders an opportunity to submit written comments on the revised tariff language.

²⁷ CAISO Management's Memorandum and Presentation to the CAISO Board regarding the Decision on Market Enhancements for Summer 2021 Readiness – Load, Export, and Wheeling Priorities are included in Attachment H hereto.

²⁸ Idaho Power, Export and Load Scheduling presentation at the CAISO workshop (Jan. 12, 2021) (Idaho Power Slide Presentation), available at: <http://www.caiso.com/InitiativeDocuments/IdahoPowerPresentation-MarketEnhancements-Summer2021Readiness-Jan122021Workshop.pdf>.

whether the situation involves transmission limitations or an energy shortage.²⁹ As Idaho Power stressed, energy priorities are “separate” from transmission priorities, and transmission priority does not dictate energy priority.³⁰ A transmission provider’s open access transmission tariff (OATT) determines its transmission priorities, but power supply contracts establish energy priorities. A transmission provider’s open access tariff may also reserve capacity for native load.

Based on the discussions at the working group meeting, the CAISO understands if transmission is constrained, other BAAs will curtail schedules in reservation priority order, including transmission schedules supporting exports from the BAA, to resolve the transmission constraint. These curtailments generally occur in NERC transmission reservation priority order, under the BAA’s OATT. BAAs curtail deliveries on non-firm transmission service before deliveries on firm transmission service, which BAAs curtail last. Accordingly, export transmission schedules are subject to potential curtailment depending upon the transmission service priority the export utilizes.

At the working group meeting, Idaho Power indicated that if the BAA’s load serving function has sold power firm power to an out-of-BAA entity from its own resources and an energy shortage occurs, its general practice is not seek to interrupt the power delivery, although the contract may allow it.³¹ For example, the terms of the Western Systems Power Pool (WSPP) Agreement provides for interruptions to “Firm Capacity/Energy Sale or Exchange Service” for reliability or service to native load.³² One consideration is that interrupting the export could

²⁹ See *id.* The CAISO understands practices regarding energy firmness are generally not documented in other BAAs’ OATTs because they pertain to energy sales priorities, not transmission curtailment priorities.

³⁰ Idaho Power Slide Presentation, at slide 2.

³¹ A key to making this work is ensuring that any sales are solely from identified surplus capacity. Thus BAAs have robust internal processes to determine what resources are needed to serve native load and what surplus resources they might undesignated to sell in the bilateral market on a daily basis. See *id.*, at slides 7- 8. BAAs can recall non-firm energy for any reason. *Id.*, at slide 9.

³² Service Schedule C, Section c-3.7, of the WSPP Agreement provides in relevant part that, “Firm Capacity/Energy Sale or Exchange Service shall be interruptible only if the interruption is: (a) within any recall time or allowed by other applicable provisions governing interruptions of service under this Service Schedule, as may be mutually agreed to by the Seller and the Purchaser, (b) due to an Uncontrollable Force as provided in Section 10 of this Agreement; or (c) where applicable, to meet Seller’s public utility or statutory obligations to its customers; provided, however, this paragraph (c) shall not be used to allow interruptions for reasons other than reliability of service to native load.” The WSPP Agreement can be found at: https://www.wspp.org/pages/documents/07_28_20_current_effective_agreement.pdf.

harm the receiving BAA and potentially cause cascading outages across other BAAs, particularly if the energy shortage affects the larger western footprint.³³

Similarly, the working group discussions indicated that during an energy shortage (as opposed to a reliability or transmission problem) BAAs generally will not interrupt exports from third-party, non-affiliated generators not committed to serve the BAA's own load because the BAA does not have rights to that generator's capacity. One exception was if, in real-time, the third-party generator supporting an export is not generating (e.g., due to forced outage) or is under-generating compared to its transmission exporting schedule, the BAA may curtail the schedules to a level commensurate with generator production to avoid exacerbating the energy shortage and associated imbalance.³⁴

3. Market Surveillance Committee Opinion

On April 16, 2021, the CAISO's MSC issued an Opinion on Market Enhancements for Summer 2021 Readiness (MSC Opinion).³⁵ The MSC Opinion recognizes that in August 2020, prioritization among classes of exports and CAISO load may have contributed to the need for the CAISO to curtail internal loads.³⁶

The MSC Opinion recognizes one general challenge the CAISO faces is to provide a reasonable framework for external BAAs to use the CAISO transmission system during extreme operating conditions despite not having requested or paid for firm transmission service on the CAISO system, within a CAISO transmission pricing design that does not provide for such payments.³⁷ Other than the carve-out for Existing Transmission Contracts (ETCs) and Transmission Ownership Rights (TORs), the CAISO system has never had a process for identifying and allocating ATC between native load and firm transmission service for use by other BAAs outside of the day-ahead and real-time market processes.³⁸ Moreover, the CAISO design does not establish a framework for defining a CBM, a measure often used in determining ATC.³⁹

³³ Additionally, harm might come to a supplier's reputation if it interrupts firm power export contracts because the purchaser may not be willing to contract in the future if the supplier does not honor the export.

³⁴ See Idaho Power Slide Presentation, at slide 10.

³⁵ The CAISO includes the MSC Opinion in Attachment I to this filing.

³⁶ *Id.* at 2.

³⁷ *Id.* at 5.

³⁸ *Id.*

³⁹ *Id.*

The MSC Opinion indicates a contributing factor to the stressed system conditions during the August heat wave was the relatively high level of exports that cleared the day-ahead market and, thus, received a priority above real-time CAISO load.⁴⁰ The MSC Opinion notes that an “appreciable portion of these exports were not explicitly supported by non-RA resources within the CAISO.”⁴¹

The MSC acknowledges the CAISO’s proposal to give exports clearing the day-ahead market, but not supported by designated, contracted for internal resources, a priority lower than CAISO load in the real-time market will ensure RA Capacity is not used to support exports when the system is under stress and there is insufficient supply to meet both CAISO load and exports.⁴² The MSC states this change reduces the possibility the CAISO will shed load while simultaneously allowing internal RA resources support to support export transactions.⁴³

The MSC Opinion also discusses the CAISO’s efforts to establish rules to ensure capacity backing high-priority non-recallable exports is contracted solely to an external entity and available and capable of supporting the export in real-time. The MSC notes the CAISO considered several approaches to validate the non-RA Capacity backing high-priority non-recallable export, but concluded it could not implement the systems and processes necessary to do this by summer 2021.⁴⁴ Thus, mechanisms the CAISO proposes to ensure the viability and availability of the capacity designated to support high-priority non-recallable exports include: (1) requiring capacity identified to support such transactions participate in the RUC process, (2) requiring that if the capacity supporting the export does not receive a RUC schedule, the scheduling coordinator must rebid the resource in the real-time market in order for the export to retain its high-priority non-recallable status; and (3) requiring the scheduling coordinators for the non-RA Capacity supporting such exports confirm they have sold the capacity only to an external entity and the resource’s forecast or dispatchable output is sufficient to support the full amount of the export schedule.⁴⁵

The MSC concludes these requirements should eliminate the potential for capacity sold to CAISO LSEs to support significant levels of exports to other

⁴⁰ *Id.* at 2.

⁴¹ *Id.*

⁴² *Id.* at 8.

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ *Id.*

BAAs during extreme operating conditions, as appeared to happen during the August and September heat waves.⁴⁶ Further, they can help avoid the potential double counting of capacity committed to support both native load and an export.⁴⁷ The MSC also believes the RUC and real-time participation requirements will ensure there is a *real* resource able to support the export. The MSC deems this an important “reality check” that has not been in place up until now.⁴⁸

The MSC Opinion also discusses the CAISO’s proposal to establish two categories of wheeling through self-schedules and the process it will conduct after the HASP to allocate capacity *pro rata*. The MSC notes that during stressed conditions native load and wheeling through self-schedules can compete for constrained transmission capacity not only on the interties into California but also on internal CAISO transmission paths. For example, transmission constraints such as Path 26 can limit the CAISO’s ability to accommodate wheeling through self-schedules without shedding native load.⁴⁹

The MSC also identifies other important facts regarding CAISO transmission service. For example, the CAISO tariff does not provide for the advance purchase of transmission service and does not have separate firm and non-firm transmission services. Instead, the CAISO charges for transmission usage by internal and external load on a per megawatt hour basis.⁵⁰ Further, the CAISO has never calculated ATC that accounts for the transmission reserved across CAISO’s system to accommodate RA imports serving a LSE’s native load or calculated a CBM. Although these CAISO transmission service features have not caused issues, the MSC recognizes that in summer 2021 external BAAs may seek to use wheeling through transactions during high load conditions more than they previously have.⁵¹

The MSC states that ideally the total ATC the CAISO potentially could assign to priority wheeling through transactions would be limited to the network capacity available after setting aside the RA transmission needs of CAISO LSEs.⁵² The MSC notes there currently is no such process in place but suggests

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ *Id.*

⁴⁹ *Id.* at 10.

⁵⁰ *Id.*

⁵¹ *Id.* at 13.

⁵² *Id.*

one ad-hoc approach could simply limit available capacity to the difference between current transmission capacity and the amount of transmission needed to accommodate RA imports.⁵³ The MSC believes a relevant consideration is whether the *magnitude* of RA requirements, and related transmission needs, are a reasonable interim measure of native load transmission requirements.⁵⁴

The MSC notes external LSEs must already meet a different set of criteria than internal CAISO LSEs to qualify for an allocation of CRRs, the main form of transmission rights in the CAISO system.⁵⁵ The MSC states that these requirements, which include prepaying wheeling access charges for the amount of MWs of CRRs nominated, are more extensive than the interim measures the CAISO is proposing for wheeling through self-schedules to have a priority equal to CAISO native load.⁵⁶

The MSC Opinion finds the CAISO's proposed conditions for priority wheeling through status are essentially an ad-hoc method of identifying existing transmission needs for external entities seeking to undertake firm wheeling through transactions absent any advance firm transmission service procurement framework. It is a short-term measure intended to accommodate neighboring BAAs who are relying on access to the CAISO system for their reliability needs this coming summer.⁵⁷ Although the MSC believes "the CAISO should do everything within reason to accommodate these needs, it also needs to balance those needs with those of its own internal load."⁵⁸ The MSC concludes the CAISO's proposal for high-priority wheeling through status would enable third-party use of the CAISO transmission system while hopefully maintaining the CAISO's ability to use its transmission system to meet network load using its designated RA Capacity resources.⁵⁹ The MSC opines that although the CAISO has not explicitly calculated ATC on each intertie taking into account RA import entitlements and a CBM, retaining capacity to deliver power from designated capacity resources to meet network load is a very conservative definition of the

53 *Id.*

54 *Id.* at 15.

55 See existing tariff section 36.9.

56 *Id.*

57 *Id.* at 16.

58 *Id.*

59 *Id.*

highest priority entitlement to use of the transmission system.⁶⁰ The MSC finds the CAISO's RA requirements are a minimal measure of the entitlement of CAISO load to the use of the CAISO transmission system. Thus, it views practices seeking to ensure resources procured for RA purposes can reach CAISO load as attempts to honor existing transmission commitments, not as discriminating against wholesale transactions.⁶¹

The MSC states that, under the CAISO's proposal, access to CAISO's transmission network would continue to be more generous and open than that found in other western BAAs.⁶² The MSC acknowledges that even with the proposed changes, high-priority wheeling transactions allowed this summer combined with the capacity the CAISO needs for RA imports could exceed the CAISOs transfer capability during some periods. The MSC notes high-priority wheels will have the equivalent of firm access under "pay as you go" terms.⁶³ The MSC believes that to the extent the capacity available to high-priority wheeling through self-schedules exceeds what an objective measure of the ATC that otherwise would have made available for sale, the CAISO will have gone beyond its obligations under open access principles.⁶⁴

D. Current CAISO Market Scheduling Priorities for Exports, Load, and Wheeling Through Transactions

The CAISO's current market scheduling priorities provide context for the changes the CAISO proposes. Scheduling coordinators may self-schedule load, exports, and/or wheels in the CAISO markets. The CAISO has only one category of transmission not associated with existing rights – new firm use.⁶⁵ The CAISO does not require transmission reservations to manage the priority of schedules to address system constraints. Instead, the CAISO manages schedules on its grid through the day-ahead and real-time markets and applies scheduling priorities defined in its tariff to curtail self-schedules (*i.e.*, price taker bids) in its markets.⁶⁶ The CAISO markets honor these self-schedules if there is

⁶⁰ *Id.*, citing April 2, 2021 Comments of Morgan Stanley Capital Group, available at: <https://stakeholdercenter.caiso.com/Comments/AllComments/10a75479-324d-491f-b688-16d98711e742#org4fd4c237-ed7f-4712-b23b-4074ad417d0e>.

⁶¹ *Id.*

⁶² *Id.*

⁶³ *Id.*

⁶⁴ *Id.* at 17.

⁶⁵ Existing tariff section 23.

⁶⁶ The scheduling priorities in the day-ahead market are specified in CAISO tariff section 31.4, and the scheduling priorities for the real-time market are specified in CAISO tariff section

sufficient generation and transmission capacity to support them. If there is insufficient supply or binding transmission constraints, the CAISO markets will curtail self-schedules to clear the market. The market software determines the priority order in which the various self-schedules are curtailed using market parameters known as “penalty prices.”⁶⁷ These penalty prices are set to specific values to (1) determine the conditions under which the market may relax a constraint may be relaxed or curtail a self-schedule and (2) establish the market prices when these events happen.⁶⁸

In the day-ahead market, self-schedule curtailments can also occur in the RUC process after the day-ahead IFM runs. The RUC process is necessary if the total amount of load scheduled in the day-ahead market does not meet the CAISO’s load forecast. Essentially it is a backstop that allows the CAISO to meet its reliability requirements.⁶⁹ The RUC process ensures there is sufficient physical supply to meet the CAISO forecast of CAISO demand. Under normal circumstances, the RUC process commits additional capacity to ensure there are sufficient resources available to serve load in real-time. When there is insufficient capacity, the RUC process either curtails IFM export schedules or, at the extreme, does not schedule sufficient supply to meet the CAISO BAA’s load forecast. The RUC process determines what portion of the day-ahead schedules are physically feasible based on power balance and intertie constraints.⁷⁰

In the day-ahead market, the scheduling priority of exports relative to load depends on whether the exporting scheduling coordinator designates a resource with non-RA Capacity as supporting the export. Export self-schedules supported by non-RA Capacity, *i.e.*, high-priority non-recallable exports, have a scheduling priority equal to CAISO self-scheduled load in the IFM and the CAISO load forecast in RUC.⁷¹ Export self-schedules that do not identify non-RA Capacity supporting the export, *i.e.*, a low-priority recallable exports, have a lower scheduling priority than CAISO self-scheduled load and demand forecast.⁷² Thus, if there is insufficient supply or binding transmission constraints, these low-priority recallable exports will only clear if there is sufficient supply to first serve

34.12.

⁶⁷ Although self-schedules with the same scheduling priority may be designated the same penalty prices, they may or may not be curtailed equally due to congestion, loss factors, or for other reasons.

⁶⁸ See existing tariff section 27.4.3 *et seq.*; see also business practice manual for market operations, section 6.6.5.

⁶⁹ *Cal. Indep. Sys. Operator Corp.*, 116 FERC ¶ 61,274, at P 129 (2006).

⁷⁰ Existing tariff sections 31.5.4-31.5.5.

⁷¹ Existing tariff section 31.4 (e).

⁷² Existing tariff section 31.4 (f).

self-scheduled CAISO load in the IFM or demand forecast and high-priority recallable exports in the RUC process. This ensures CAISO does not use RA Capacity to support exports when it need the capacity to serve CAISO load. Finally, if there is sufficient supply to clear all self-scheduled day-ahead export and load self-schedules, the market will consider economic load and export bids.

The CAISO uses a validation process to ensure a resource supporting a high-priority non-recallable export is eligible for designation. When a scheduling coordinator submits a high-priority non-recallable export, it provides the self-schedule MW amount and identifies a supporting resource. The CAISO validates the designated resource has sufficient non-RA supply participating in the market to support the export by comparing the resource's upper economic limit (*i.e.*, the highest operating level in the resource's energy bid) to the resource's designated RA Capacity. Any MW quantity exceeding the designated resource's available non-RA Capacity has a low-priority recallable export priority. This validation only occurs in the day-ahead market; if RUC schedules the non-RA Capacity, the CAISO does not re-verify it because all RUC exports receive the same real-time priority.⁷³ In addition, the validation process does not consider outages, commitment status, or deliverability of the designated resource.

If export and load self-schedules and economic bids clear in the IFM and are deemed physically feasible in the RUC process, they receive the highest level of priority (including over CAISO real-time load) when self-scheduled in the real-time market.⁷⁴ The market respects that high priority in real-time regardless

⁷³ Existing tariff section 34.12.1. The CAISO verifies if non-RA Capacity is supporting incremental high-priority non-recallable exports submitted in the real-time market above the designated resource's RUC schedule.

⁷⁴ During the August heat wave, any export cleared in the IFM received higher scheduling priority than CAISO load in the real-time market. Following the August heat events, the CAISO reviewed and changed its scheduling and tagging processes documented in a business practice manual because they did not appropriately account for the CAISO load forecast relative to IFM schedules, particularly the amount of virtual supply scheduled in the IFM. This caused the scheduling and tagging processes erroneously to determine the system could physically support more exports than it actually could. The CAISO implemented an emergency business practice manual change on September 5, 2020 modifying its process to give this high scheduling priority only to day-ahead exports determined to be physically feasible in the RUC process. Thus, exports scheduled in the IFM, but curtailed in the RUC process, now have a lower scheduling priority than CAISO load in the real-time market. Specifically, the CAISO changed two rules in the CAISO business practice manual to resolve this issue. First, the CAISO clarified the RUC process will use schedules from the scheduling run instead of schedules from the pricing run. The CAISO determined it is more effective to use the RUC's scheduling run to reflect export curtailments correctly. Second, the CAISO clarified it will use RUC schedules for exports, instead of IFM schedules, to determine the day-ahead export amounts that can be tagged, and if not re-bid in, inserted as self-schedules into the real-time market. That is, the RUC schedule would determine the quantity market participants should tag when they submit the export e-Tag in the

of what priority the export had in the day-ahead market (*i.e.*, high-priority non-recallable export, low-priority recallable export, economic bid). Effectively, this means the CAISO's market parameters prioritize the delivery of exports deemed physically feasible from the day-ahead market even if in that interval CAISO determines it must use its RA Capacity to avoid shedding load because system conditions have changed.

Scheduling coordinators can submit incremental self-scheduled exports in the real-time market besides any day-ahead schedule. If these real-time self-scheduled exports designate supporting non-RA Capacity, they receive equal priority to CAISO load in real-time and a priority higher than any new low-priority recallable exports submitted in real-time (but lower than feasible day-ahead exports). Consistent with day-ahead market priorities, the tariff accords new low-priority recallable export schedules in the real-time market a priority higher than any economic export bids.

Besides self-scheduling load and exports, scheduling coordinators can also self-schedule wheeling transactions through the CAISO system.⁷⁵ Wheeling through self-schedules consist of both an import self-schedule and an export self-schedule and can occur between any two intertie points.⁷⁶ The CAISO maintains a market constraint to ensure wheeling through transactions remain balanced (*i.e.*, the import quantity equals the export quantity).⁷⁷ This constraint respects the penalty factors associated with curtailing both the import self-schedule and the export self-schedule. These penalty factors are additive. Combining the penalty factors specified in the business practice manual provide self-scheduled wheeling through transactions a higher scheduling priority in the market than both high-priority non-recallable exports and serving internal CAISO load. The CAISO tariff does not specify priorities for self-scheduled wheeling through transactions.⁷⁸ The higher priority the CAISO currently provides wheeling through self-schedules arises solely from applying parameters in the market software.⁷⁹

day-ahead timeframe. Business practice manual for market operations, sections 6.7.4.1 and 7.1.6.

⁷⁵ Existing tariff section 30.5.4.

⁷⁶ *Id.*

⁷⁷ Business practice manual for market operations, section 2.5.2.2.

⁷⁸ See existing tariff sections 31.4 and 34.12.

⁷⁹ Contemporaneous with this tariff amendment filing, the CAISO is proceeding to change its business practice manuals to set CAISO market parameters so all wheeling through self-schedules will have the same priority as serving CAISO load. Given tight supply conditions in the Western Interconnection, this business practice manual change does not eliminate the critical need for the tariff revisions proposed in this filing establishing two categories of wheeling through

Scheduling coordinators can also submit wheeling through transactions using economic bids, with both the import and export legs providing economic bids.⁸⁰ If there is sufficient supply to support all self-schedules, wheeling through transactions and exports with economic bids compete for the remaining transmission capacity.

E. Need for Tariff Revisions

Based on its analysis of the August heat wave events, findings in the Preliminary and Final Root Cause Analyses and DMM Report, and extensive discussions with stakeholders, the CAISO determined it is appropriate to modify the priorities the CAISO market places on serving CAISO BAA load relative to self-scheduled exports from, and wheeling through schedules across, the CAISO BAA.

The Preliminary Root Cause Analysis recommended the CAISO:

- Continue to review and clarify through changes to its tariffs and business practice manuals the existing rules for scheduling priorities and protection of internal and external schedules
- Ensure that market processes appropriately curtail lower-priority exports not supported by non-RA resources to minimize the export of RA Capacity during reliability events.

⁸¹

The Final Root Cause Analysis similarly recommended the CAISO stakeholder process consider changes that incentivize “appropriate prioritization of export schedules.”⁸² The Final Root Cause Analysis acknowledged the business practice manual changes the CAISO implemented on September 5, 2020 to address export-related problems with the RUC process, but recognized the CAISO had initiated a stakeholder process “to consider additional necessary

transactions (and related revisions). If the Commission approves these proposed tariff revisions, the CAISO will modify its business practice manual to specify that only Priority Wheeling Through transactions will have the same priority as CAISO load. Non-Priority Wheeling Through transactions will have lower priority than CAISO load, as discussed in this filing.

⁸⁰ Existing tariff section 30.5.4.

⁸¹ Preliminary Root Cause Analysis at 66.

⁸² Final Root Cause Analysis at 70.

changes to its management of export schedules.”⁸³ Both the Preliminary Root Cause Analysis and the Final Root Cause Analysis identified a problem with the market processes erroneously signaling that more exports were physically supportable than actually were.⁸⁴

The DMM Report found one of the contributing factors to the August load shedding was the self-scheduling of relatively large volumes of exports in the day-ahead market not backed by imports being wheeled-through the CAISO system or with contracts for capacity with internal CAISO resources.⁸⁵ The DMM Report noted (1) this increased the overall demand the CAISO’s day-ahead and real-time markets had to meet because the RUC process passed exports not supported by real supply into the real-time market, and (2) these export schedules were not curtailed in the real-time during the hours the CAISO curtailed internal load.⁸⁶ The DMM Report recognized the CAISO’s policy is to prioritize exports not backed by specific resources, but which receive RUC awards, over native CAISO BAA load.⁸⁷ The DMM Report noted this policy exposes the CAISO BAA to the risk of cutting native load when conditions change between the day-ahead time frame and real-time, and when there would have been sufficient RA Capacity to avoid cutting CAISO native load had the CAISO not committed capacity to exports in the day-ahead time frame.⁸⁸

The DMM Report recommended the CAISO pursue rule changes to limit or curtail exports consistent with recommendations in the Preliminary Root Cause Analysis. Specifically, the DMM Report concluded the CAISO should ensure market processes appropriately curtail lower-priority exports not supported by non-RA Capacity resources to minimize the export of capacity associated with RA resources during reliability events.⁸⁹ DMM recognized the CAISO’s current policy is to prioritize exports receiving RUC awards over native CAISO BAA load in real-time and “appreciated that curtailment of exports should be avoided when possible” given the potentially detrimental effects on other

⁸³ *Id.* at 63.

⁸⁴ *Id.*; Preliminary Root Cause Analysis at 57-58.

⁸⁵ DMM Report at 2. The DMM Report shows that in each of the hours the CAISO shed load, there were close to 3,000 MW of HASP export schedules that were not backed by designated capacity, but received a real-time scheduling priority above CAISO native load simply because they cleared the IFM. *Id.* at 46-47.

⁸⁶ *Id.*

⁸⁷ *Id.* at 70.

⁸⁸ *Id.* at 70-71.

⁸⁹ *Id.* at 4, 67-68, citing Preliminary Root Cause Analysis at 66.

BAAs. However, DMM concluded changes to the market rules are necessary to address the export issues identified in the Preliminary Root Cause Analysis and its report.⁹⁰

During the underlying stakeholder process, the CAISO and stakeholders identified other problems arising from the CAISO's treatment of exports and wheeling through transactions. For example, several stakeholders stressed that, to address the concerns identified in the joint root cause analyses, schedules not backed by contracted supply should not have a priority higher than internal load in real-time.⁹¹ Stakeholders stated quantities under contract with a CAISO LSE for a month, but not shown on a RA Plan for that month, should not be permitted to support high-priority non-recallable exports.⁹² Stakeholders also noted that during the August 2020 load shed events, capacity CAISO LSEs had procured above resources' net qualifying capacity (NQC) supported cleared exports, but LSEs could not show this capacity as RA Capacity in their RA Plans. These stakeholders argued such capacity, which is subject to a must-offer obligation, should be ineligible to support a high-priority non-recallable export.⁹³ Stakeholders also objected that the CAISO supports and enables priority exports even though if the resources backing such exports do not perform in real-time (e.g., due to forced outage, derates, or units meeting their use-limitations). They noted the CAISO's market rules allow the CAISO's pool of system resources (including RA Capacity) to serve exports instead of serving internal load during tight conditions. They argued the CAISO should prevent resources from backing high-priority non-recallable exports for quantities exceeding what the resource actually can produce.⁹⁴ Finally, stakeholders expressed concern that resources with undeliverable capacity (e.g., an energy-only resource in a generation pocket) can support a high-priority non-recallable export, noting this can cause the market to commit RA Capacity to support the export if the scheduled energy does not materialize. This can prevent RA Capacity from serving internal load during shortage conditions.⁹⁵

⁹⁰ *Id.* at 5.

⁹¹ See Comments of CPUC – Energy Division and Pacific Gas and Electric Company (PG&E) on January 12 Load and Export Scheduling Workshop; Comments of DMM, Southern California Edison Company (SCE), San Diego Gas & Electric Company (SDG&E), and the CPUC Staff on Summer 2021 Readiness Straw Proposal.

⁹² See, e.g., Comments of PG&E and the CPUC – Energy Division, on Straw Proposal; Comments of the CPUC – Energy Division on January 12 Load and Export Scheduling Priorities Workshop.

⁹³ See, e.g., Comments of SDG&E and SCE on Straw Proposal.

⁹⁴ See Comments of PG&E on January 12 Load and Export Scheduling Workshop; Comments of SCE on Straw Proposal.

⁹⁵ See Comments of PG&E on January 12 Load and Export Scheduling Workshop;

During the stakeholder process, stakeholders also noted that unlike load and export priorities, the CAISO tariff did not explicitly specify any scheduling priority for wheeling through transactions in the day-ahead and real-time market optimization processes. The CAISO acknowledged that, in practice, it was providing self-scheduled wheeling through transactions a priority higher than self-scheduled internal load through application of parameters in the market software. Numerous stakeholders objected to this practice. They argued (1) there was no policy (or tariff) basis to grant self-scheduled wheeling through transactions a higher priority than self-scheduled internal load, (2) wheeling through transactions, unlike internal load, have no long-term commitment to pay the costs of the CAISO grid, and (3) the practice could block internal RA resources from serving CAISO load during emergency conditions.⁹⁶ Stakeholders also argued the priority the CAISO was according wheeling through transactions was contrary to the native load priority and treatment of network resources under Order No. 888 and its progeny.⁹⁷ DMM stressed that self-scheduled wheeling through transactions from Malin to Palo Verde could cause congestion between northern and southern California, potentially displacing internal generation in northern California that bids its marginal cost above \$0/MWh when such generation is need to serve load in southern California.⁹⁸

Finally, discussions with some stakeholders from external BAAs highlighted issues arising when a resource proving both RA Capacity and non-RA Capacity has a derate. These stakeholders sought to ensure a reduced, *pro rata* share of the capacity sold to the external entity could still support a high-priority non-recallable export.

III. PROPOSED TARIFF REVISIONS

The CAISO proposes several changes to the scheduling priorities for internal load, exports, and wheeling through transactions in the day-ahead and

Comments of CPUC Staff and SDG&E on Straw Proposal.

⁹⁶ See, e.g., Comments of PG&E on January 12 Load and Export Scheduling Priorities Workshop; Comments of California Community Choice Association on Draft Final Proposal. For example, PG&E expressed concern that the potential for large price differentials this summer between the Pacific Northwest and the Desert Southwest likely would increase the number of wheeling through transactions, which could block internal RA resources from being dispatched to serve CAISO load during emergencies. Comments of PG&E on January 12 Load and Export Scheduling Priorities Workshop and Draft Final Proposal.

⁹⁷ See, e.g., Comments of the Six Cities on Straw Proposal; Comments of the CPUC – Energy Division on Draft Final Proposal.

⁹⁸ Comments of DMM on Draft Final Proposal.

real-time market optimization processes. Second, the CAISO proposes certain bidding and behavioral rules applicable to resources backing high-priority non-recallable exports. Third, the CAISO proposes tariff clarifications regarding the treatment of resource derates when only a portion of a resource's capacity is RA Capacity. This will facilitate partial RA resources supporting high-priority non-recallable exports. Finally, the CAISO proposes a post-HASP process to reallocate import and internal transmission between Priority Wheeling Through transactions and native load *pro rata* when applying the penalty parameters in the market optimization process fails to allocate transmission capacity proportionally. The CAISO discusses these proposed tariff revisions in greater detail below.

A. Scheduling Priority and Rule Changes for Exports

The CAISO proposes changes to the scheduling priorities for export self-schedules in the real-time market's optimization process and new rules regarding the capacity that can support high-priority non-recallable exports. The proposed changes build on the business practice manual changes the CAISO made on September 5, 2020 to distinguish further high-priority non-recallable exports from low-priority recallable exports and ensure high-priority non-recallable exports are physically and contractually feasible, producing fairer, more reliable market outcomes. The proposed tariff revisions (1) ensure capacity contracted by CAISO LSEs is available to meet CAISO needs in the first instance and (2) ensure market processes appropriately curtail lower-priority exports that are not supported by capacity contracted solely to the exporter or are supported by resources that are unavailable in real-time. The proposed changes also address the concerns raised by the DMM Report by modifying the scheduling priority of exports not supported by contracted-for, non-RA Capacity relative to CAISO internal load, while ensuring exports of available capacity contracted only to serve load outside of the CAISO BAA receive the same priority as the CAISO's internal load.

As discussed above these export-related tariff revisions are severable from the wheeling through priority tariff revisions. Further, from a substantive perspective, each export-related tariff revision is discrete and stands on its own from the other export-related tariff revisions. They are severable from each other and are not interdependent. Commission action on one of these export-related tariff revisions will not affect the justness and reasonableness of the other export-related changes. The Commission should evaluate the justness and reasonableness of each of the proposed export-related tariff revisions on its individual merits. Rejection of any proposed change should not cause the Commission to reject any other proposed tariff revision.

1. Revisions to Real-Time Scheduling Priorities

The CAISO proposes two changes to the scheduling priorities for self-scheduled exports in the real-time market optimization.

a. Low-Priority Recallable Exports Receiving a Day-Ahead Schedule Will Have a Lower Real-Time Market Priority than Serving CAISO Native Load

The CAISO proposes that exports not explicitly backed by capacity designated solely to serve external load (*i.e.*, low-priority recallable exports) receiving a day-ahead market schedule will have a priority lower than serving CAISO load in the real-time optimization.⁹⁹ The CAISO will continue to provide exports explicitly backed by non-RA Capacity designated to serve external load (*i.e.*, high-priority non-recallable exports) equal priority to serving CAISO load in the real-time market.¹⁰⁰ Under current rules, a low-priority recallable export scheduled in the day-ahead market automatically has a priority higher than serving CAISO load in the real-time market based on the export quantity the RUC process finds to be feasible, even if potentially meeting it with RA Capacity. This framework creates the possibility the market will use RA Capacity procured by California LSEs to support low-priority recallable exports.

The CAISO's proposal eliminates this untenable outcome. The proposed change appropriately affords low-priority recallable exports supplied through the market a priority lower than CAISO load in the real-time, ensuring RA Capacity needed to serve CAISO load in tight supply conditions does not instead back low-priority recallable exports. The RUC process in the day-ahead market cannot preclude CAISO RA Capacity from supporting low-priority recallable exports because RUC schedules resources from the entire pool of resources available to it to meet overall demand (which includes forecast CAISO load and exports). Nothing precludes RUC from scheduling low-priority recallable exports even if there is insufficient non-RA Capacity to back them. This contrasts with high-priority non-recallable exports that require support by bids from non-RA Capacity. Despite RUC calculating there is sufficient capacity to support these low-priority recallable exports, however, conditions may change between the day-ahead and real-time markets, and the CAISO may need the RA Capacity to meet CAISO load in the real-time market, even if it did not need capacity in the day-ahead market. The CAISO's proposal ensures that if supply conditions

⁹⁹ Revised tariff section 34.12.1.

¹⁰⁰ Revised tariff section 34.12.1 (a).

become tight in real-time the CAISO can use its RA Capacity to serve internal load, not support exports that failed to secure non-RA Capacity.

The proposed change is foundational to ensure the real-time market will curtail low-priority recallable exports to avoid the export of CAISO RA Capacity during tight system conditions. The proposal still ensures high-priority non-recallable exports that have secured capacity solely designated to serve external load in advance receive a real-time market priority equal to CAISO load.¹⁰¹ This aligns with the root cause analysis recommendation that the CAISO “[e]nsure that market process appropriately curtail lower-priority exports that are not supported by non-RA resources to minimize the export of capacity that could be related to RA resources during reliability events.”¹⁰² It also aligns its market rules with Commission precedent that internal demand and exports supported by non-RA Capacity should have a higher priority than exports supported by RA Capacity.¹⁰³ This is appropriate given the capacity payments CAISO LSEs make to RA Capacity in return for them being available when needed by the CAISO.¹⁰⁴ The Commission has acknowledged that exports supported by RA Capacity are not firm sales, but are essentially non-firm, recallable opportunity sales.¹⁰⁵ The CAISO’s proposal is consistent with these findings and will ensure that in tight supply conditions, RA Capacity will serve CAISO load in the first instance.

b. Priority of Low-Priority Recallable Exports Deemed Feasible in RUC and Scheduled in the Real-Time

The CAISO clarifies its tariff to state explicitly that low-priority recallable exports deemed feasible in RUC and self-scheduled into the real-time market will continue to receive higher priority than new low-priority recallable exports bidding in the real-time market.¹⁰⁶ Thus, if there are supply insufficiencies, the CAISO will curtail incremental low-priority recallable exports submitted in the real-time market before low-priority recallable exports backed by a day-ahead RUC schedule.

¹⁰¹ See revised tariff section 34.12.1 (a).

¹⁰² Preliminary Root Cause Analysis at 66.

¹⁰³ *California Indep. Sys. Operator Corp*, 116 FERC ¶ 61,274, at P 1285, *order on reh’g*, 119 FERC ¶ 61,076 at P 619 (2007).

¹⁰⁴ 116 FERC ¶ 61,274, at P 1285; 119 FERC ¶ 61,076, at P 619.

¹⁰⁵ 119 FERC ¶ 61,076, at P 619.

¹⁰⁶ Revised CAISO tariff sections 34.12.1 (b) and (c).

This encourages forward scheduling of low-priority recallable exports because they will have a higher priority than low-priority recallable exports scheduled in real-time. Encouraging day-ahead scheduling is important because it allows the market more flexibility to ensure there is sufficient on-line supply, such as scheduling additional imports or starting long-start generation.

2. Rule Changes Applicable to High-Priority Non-Recallable Exports

In the stakeholder process, the CAISO considered measures to ensure that during times of stressed system conditions (1) capacity sold to CAISO LSEs is not supporting high-priority exports, and (2) only resources available and capable of meeting their hourly block export schedules are supporting high-priority exports. Today, the CAISO's validation of designated supply does not consider outages, commitment/contractual status, or deliverability. The CAISO assessed several approaches for validating non-RA Capacity to ensure the capacity supporting a high-priority non-recallable export is committed solely to the exporter and has available energy to support the transaction. However, the CAISO realized implementing the necessary validation rules and processes would be extremely complex and concluded it could not implement such rules by summer 2021.

Accordingly, the CAISO proposes other measures that it can implement by summer 2021 to address these gaps in the near-term. These measures include: (1) RUC and real-time market participation requirements to ensure the capacity supporting high-priority non-recallable exports is available through real-time; (2) behavioral rules to ensure designated resources backing high-priority non-recallable exports can physically do so and have only sold the capacity to an external entity, and (3) rules specifying capacity that can support high-priority non-recallable exports. Prior to the market clearing process, the CAISO cannot prevent designated resources from backing high-priority non-recallable exports when they are physically incapable of doing so or have sold the capacity to a CAISO LSE (but which is not shown as RA Capacity) given the timing and status of the CAISO's validation rules and systems. However, after the fact the CAISO can refer to the Commission under CAISO tariff section 37 actions that potentially violate tariff rules or constitute submitting false information. The proposed rules will help ensure that when there is insufficient supply to meet both CAISO load and exports, resources intended to serve CAISO load are not instead enabling exports unsupported by designated capacity. This provides the CAISO greater flexibility to ensure it can recall exports potentially backed by RA Capacity to meet CAISO load.

**a. Only Capacity Sold Solely to an External LSE
Should Back a High-Priority Non-Recallable
Export**

The CAISO proposes tariff revisions whereby scheduling coordinators must confirm that a resource backing a high-priority non-recallable export has sold the capacity only an entity outside of the CAISO BAA. A scheduling coordinator must indicate to the CAISO in advance that its resource has sold capacity to an external LSE, and no CAISO LSE has a right to such capacity.¹⁰⁷ If the resource's scheduling coordinator does not affirmatively indicate this status, the resource cannot be a designated resource for a high-priority recallable export.¹⁰⁸ To the extent practicable, the CAISO will notify a scheduling coordinator hourly that an exporter had designated its resource to support a high-priority non-recallable export for a particular hour.¹⁰⁹ Upon receiving the notice, the scheduling coordinator of the designated resource must notify the CAISO if it is not contractually committed to support such export self-schedule or does not have a reasonable expectation the resource will be available to support the export self-schedule.¹¹⁰

The proposed rules will better ensure capacity from designated resources is only under contract to serve load in another BAA. Capacity under contract to CAISO LSEs should not support a high-priority non-recallable export. The CAISO must rely on these notification and verification types of rules because it cannot develop and implement the systems and processes necessary to validate actual contractual arrangements between exporters and internal resource owners by summer 2021.

Among other objectives, these proposed rules seek to address a gap in the current tariff whereby capacity CAISO LSEs have contracted/paid for under the RA program and other CPUC programs, but which does not meet the literal definition of RA Capacity under the CAISO tariff, can support a high-priority non-

¹⁰⁷ New tariff section 30.5.1(aa). The CAISO intends to create a new Master File flag that the resource scheduling coordinator should select to confirm the capacity designated to support a high-priority non-recallable export satisfies the aforementioned rules. As a default, the CAISO will set the Master File flag to NO, *i.e.*, the resource cannot meet the rules to support a PR export. Thus, the resource's scheduling coordinator must affirmatively select the flag to verify the designated capacity meets the rules applicable to high-priority non-recallable exports. The proposed tariff language provides sufficient flexibility to the CAISO to effectuate this requirement via an alternative workable mechanism other than through the Master File if the CAISO can develop one.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

recallable export. This can include capacity sold to a CAISO LSE under a RA contract that a LSE does not show on its monthly RA Plan because the LSE is “saving” the capacity potentially to use it as substitute capacity if one of its shown RA resources has an outage (or for some other reason). In addition, it can include capacity sold to a CAISO LSE under a bilateral RA contract above the resource’s NQC, which the RA rules preclude the LSE from showing as RA Capacity in an annual or monthly RA Plan.

CAISO LSEs must submit annual and monthly RA Plans to meet 100 percent of their applicable system, local, and flexible capacity requirements for that month. LSEs do not have to show all of the capacity for which they have contracted in their RA Plans. They are only required to show sufficient capacity to meet their monthly obligations. LSEs do not show all of their procured capacity in their RA Plans for many reasons. The capacity may be on a planned outage for the month or they may be holding the capacity “in reserve” if they need to provide it as substitute capacity if their shown RA resources goes on a planned or forced outage during the month. Further, LSEs may not show procured capacity unnecessary to satisfy their RA obligations because it would subject the capacity to the RA must-offer obligation and potential non-availability charges under the Resource Adequacy Availability Incentive Mechanism (RAAIM). However, under the current tariff rules, the market can use the capacity CAISO LSEs have paid for to back a high-priority non-recallable export because the CAISO cannot validate it as RA Capacity. However, the CAISO cannot change these validation rules and systems by this summer.¹¹¹ The CAISO must instead rely on the proposed notification and verification process and possible after the fact referrals to the Commission, to discourage suppliers from supporting high-priority non-recallable exports with capacity they have sold to a CAISO LSE, but the LSE has not shown on a RA Plan.

A second gap involves situations where CAISO LSEs have procured through bilateral RA contracts capacity from variable energy resources and other availability-limited resource types (e.g., hydro resources) that they cannot show in RA Plans. Variable energy resources and other availability-limited resource types typically have PMax levels that are higher than their NQC capacity for RA purposes. Under current RA counting rules, NQC values for variable energy (e.g., wind and solar) and other (e.g., hydroelectric) resources are determined based on statistical modeling or historical performance, which typically produces a qualifying capacity (QC) well below the PMax values of these resources.¹¹² For

¹¹¹ Further, simply changing the definition of RA Capacity to include this type of capacity would have unintended consequences, including subjecting such capacity to the must-offer obligation and RAAIM.

¹¹² For example, the NQC for wind and solar resources is determined using the Effective

wind and solar resources, QC values reflect the capacity value of different resources relative to “perfect capacity.”¹¹³ This statistical approach results in significant reductions in QC values for wind and solar resources, especially during peak months.

Under the RA rules, even if a LSE has procured the entire capacity of the resource through a bilateral RA contract, it cannot show an amount above the resource’s NQC on its monthly RA Plan, and the supplier cannot show an amount above NQC on its monthly supply plan.¹¹⁴ Thus, a solar resource with a PMax of 100 MW may have only 20 MW of NQC, which is the maximum quantity a LSE can show on a RA Plan and a supplier can show on a supply plan. However, such RA resource may have to submit bids into the CAISO markets for up to 100 MW depending on its forecasted energy during the day.¹¹⁵

Allowing a resource’s scheduling coordinator to designate capacity above the resource’s NQC to support a high-priority non-recallable export under these circumstances is unjustified for several reasons. Although a CAISO LSE cannot show the additional MW of capacity on a RA Plan, the LSE may have contracted for the resource’s entire capacity. Further, under applicable RA counting rules, resource performance both above and below NQC counts toward determining the NQC of the resource for RA counting purposes.

A third gap in the current rules involves CPUC where LSEs make capacity payments to resources and count on such capacity to meet their service obligations, but they do not show the capacity on RA Plans. Under current tariff rules, capacity from these resources can support a high-priority export because it does not meet the tariff definition of RA Capacity even though CAISO LSEs have paid for the capacity to meet their service obligations.

Resources should not be backing high-priority non-recallable exports with capacity sold under bilateral contract to a CAISO LSE that must offer into the CAISO market (even though the LSE does not show the capacity on a monthly RA Plan).¹¹⁶ Absent the proposed rule, the resource owner could double sell

Load Carrying Capability (ELCC) methodology. The CPUC adopted an ELCC to establish QC values for wind and solar resources in 2016. The CPUC’s adopted methodology uses statistical modeling to determine the capacity value of wind and solar resources relative to perfect capacity. See CPUC Decision 17-06-027.

¹¹³ See CPUC Decision 16-06-045. The CAISO translates resources’ QC values into NQC values based on testing and its deliverability studies.

¹¹⁴ Existing tariff sections 40.2.2.4 and 40.4.7.3(a).

¹¹⁵ Existing tariff section 34.1.6.1.

¹¹⁶ The circumstances are comparable to the treatment of resources in other market regions

capacity – without potential consequence – if the capacity supporting a high-priority non-recallable export offered into the CAISO markets overlaps with the RA resource’s capacity already sold to a CAISO LSE.¹¹⁷

The CAISO’s proposal will help ensure capacity sold and dedicated to CAISO LSEs is not used to support a high-priority non-recallable export, even though it is not (and cannot be) shown on a RA Plan in a month. CAISO LSEs have made capacity payments for such capacity, and external LSEs should not have priority use of it.¹¹⁸

The CAISO recognizes its notice and confirmation process is not the optimal approach to remedying this situation, but it is just reasonable and the only feasible solution the CAISO can implement this summer to address the problem. Violations of the proposed rules will be subject to referral to the Commission under CAISO tariff section 37. This should help discourage resources from supporting high-priority non-recallable exports with capacity they have sold to CAISO LSEs.

Some stakeholders suggested early in the stakeholder process that instead of imposing the confirmation obligation on the resource’s scheduling coordinator, the CAISO should consider placing the obligation on the exporter’s scheduling

where the regional transmission organization determines a resource’s RA/Capacity Resource value based on historical performance using an unforced capacity (UCAP) methodology. Such RA/Capacity resources have a must-offer obligation equal to their installed capacity even though their UCAP-determined RA/Capacity values are lower. See *Midwest Indep. Transmission System Operator, Inc.*, 125 FERC ¶ 61,061, at P 119 (2008) (stating is a capacity resource was only required to offer at its unforced capacity level, it could sell the remaining capacity of-system, thus subverting the intent of the planning reserve margin); *Coalition of Midwest Power Producers, Inc. v. Midcontinent Indep. Sys. Operator, Inc.*, 166 FERC ¶ 61,159, at P 6 (2019); *Big Sandy Peaker Plant, et al. v. PJM Interconnection, LLC*, 154 FERC ¶ 61,216 at P 43 n.89 (2016), citing *Duke Energy Corp.*, 151 FERC ¶ 61,208, at P 62 (2015) and *PJM Interconnection, LLC*, 139 FERC ¶ 61,057, at P 205 (2012) (capacity resources must offer energy from all their capacity in the day-ahead market and operate in accordance with PJM dispatch instructions if PJM calls upon them to operate). If a resource could sell the difference between its installed capacity value and its RA Capacity value the market operator would not have the planning reserve margin it calculated, and that would be detrimental to system reliability. 125 FERC ¶ 61,061, at P 119. This recognizes that to achieve performance equal to their UCAP values (and accurately count the reliability value of the resource), these RA/Capacity resources would have to be available 100 percent of the time at their UCAP value otherwise the CAISO would be short of RA Capacity. This also prevents resources that are exempt from RAIM (e.g., variable energy resources) from avoiding the consequences of poor availability by simply contracting to sell their “haircut amount,” i.e., the difference between PMax and NQC, to LSEs in other BAAs.

¹¹⁷ Under section 34.1.6.1 of the CAISO tariff, eligible intermittent resources are obligated to bid up to their forecasted energy levels on a given day, which can exceed the resource’s NQC.

¹¹⁸ See 116 FERC ¶ 61,274, at P 1285.

coordinator. They stated the proposal creates additional steps that might be burdensome, create uncertainty and, if missed, could be problematic.

There is no need to modify the CAISO's proposal. The resource's scheduling coordinator will merely check a flag in the Master File indicating it has sold capacity to an external LSE. Once the scheduling coordinator clicks the flag, the resource can support a high-priority non-recallable export. The scheduling coordinator need not change the flag hourly. If the CAISO subsequently informs the scheduling coordinator its resource is supporting a high-priority non-recallable export, the scheduling coordinator must notify the CAISO only if the resource does not have a contractual commitment, or is unavailable, to support the export. This requirement is reasonable.

Further, the resource's scheduling coordinator, not the exporter's scheduling coordinator, is the appropriate entity to verify this information. The resource's scheduling coordinator is the entity responsible for bidding and scheduling the resource into the CAISO markets. It is best positioned to know all of the resource's contractual commitments (and whether the resource's capacity has been double sold) and whether the resource is available to support the export in real-time. The scheduling coordinator for the exporter does not represent the resource. The exporter's scheduling coordinator is less likely to know all the resource's contractual arrangements or whether the resource has double-sold capacity. In addition, the resource's scheduling coordinator, not the exporter's scheduling coordinator, is the most appropriate entity to notify the CAISO the designated resource is unavailable to support the export. The resource's scheduling coordinator represents the resource and is best positioned to know the resource's availability, the existence of any outages/derates, the unit's current physical capabilities, and the resource's hourly forecasts.

The CAISO intends the proposed confirmation requirement to support a possible referral to the Commission if a resource's scheduling coordinator submits false information to the CAISO. This should discourage scheduling coordinators from confirming their resource can support a high-priority non-recallable export if the resource has sold to a CAISO LSE or the resource is unavailable to back the export in real-time. Mere confirmation by the exporter's scheduling coordinator that the resource sold the capacity to an external LSE is insufficient because the exporter's scheduling coordinator may not know if the resource sold the designated capacity to a CAISO LSE. Any enforcement action under these circumstances more properly pertains to the scheduling coordinator for the resource.

b. Resources Designated to Support High-Priority Non-Recallable Exports Must Be Available and Capable of Sustaining the Export Quantity for the Entire Hour

As indicated above, the CAISO intends to notify the scheduling coordinator for a resource hourly, to the extent practicable, that another entity has designated the resource to support a high-priority non-recallable export. The CAISO proposes to add a tariff rule providing that following such notice the scheduling coordinator for the designated resource and the scheduling coordinator for the export shall ensure the resource designated to support such export self-schedule has sufficient available capacity to support the export quantity throughout the entire hour.¹¹⁹

The proposed tariff language further clarifies that variable energy resources can satisfy this requirement only if their forecasted quantity for each of the four 15-minute intervals at the time of bid submission is for generation equal to or greater than the self-schedule export quantity.¹²⁰ Thus, variable energy resource capacity not contracted by a CAISO LSE can meet this requirement if the resource's forecast can support the export quantity in all 15-minute intervals within the hour. For example, assume the forecast for the hour is: interval 1 is 50 MW, interval 2 is 45 MW, interval 3 is 55 MW and interval 4 is 60 MW. The resource could support a 45 MW high-priority non-recallable export, but it could not support a high-priority non-recallable export for any higher amount.

These proposed rules will require scheduling coordinators for a designated resource and high-priority non-recallable export self-schedule to coordinate and try to ensure the designated resource has sufficient available capacity to support the hourly block schedule. Self-schedule export bids can only clear the day-ahead market and real-time market as a block hourly schedule. However, certain resource types may be unable to sustain their fixed MW quantity over the entire course of a block hourly schedule. Resources unable to sustain their scheduled MW quantity for the entire hourly block should not be supporting a high-priority non-recallable export because, if the designated resource fails to sustain an hourly block schedule, the CAISO will be forced to support the export from system supply to the detriment of CAISO internal load. For example, if the high-priority non-recallable export quantity is 40 MW, and the designated resource is only producing 10 MW, the market software would have

¹¹⁹ New tariff section 30.5.1(aa).

¹²⁰ *Id.*

to find 40 MW to serve the export, which otherwise would serve CAISO load. This is an unjust and unreasonable result. Unfortunately, the CAISO cannot implement any processes and system changes this summer to validate the export quantity against the designated resource's actual production. Instead, the CAISO must rely on the proposed behavioral rule – and the risk of potential referral to the Commission – to discourage such behavior.

c. Only Capacity that Is Deliverable Can Support a High-Priority Non-Recallable Export

The CAISO also proposes that designated capacity supporting a high-priority non-recallable Export must be the deliverable capacity of a resource with Full Capacity Deliverability Status, Partial Capacity Deliverability Status, or Interim Deliverability Status shown on the CAISO's NQC list.¹²¹ The CAISO has performed a deliverability assessment of these resources and determined a portion of their capacity is deliverable to load during peak conditions. Deliverability is a fundamental requirement to provide RA Capacity because there must be sufficient transmission capacity to deliver generators' energy to load during peak conditions.¹²² Interconnection customers requesting deliverability must finance additional delivery network upgrades to ensure their deliverability.¹²³

During the generator interconnection process, studies assess what transmission system upgrades are necessary to ensure deliverability of an interconnecting resource's energy. Resource owners can elect Full Capacity Deliverability Service, Partial Deliverability Capacity Service, or Energy-Only Deliverability Status. Further, the CAISO conducts a deliverability study annually to determine if resources can serve the aggregate of Load during peak periods.¹²⁴ The CAISO incorporates the study results in determining resources' NQC for RA eligibility purposes and posts a list of studied resources' NQC

¹²¹ *Id.*

¹²² See tariff Appendix A, existing definition of "Deliverability Status;" existing Appendix DD, section 6.3.2.

¹²³ See existing tariff Appendix DD, section 6.3.2.1. Energy Only interconnection customers must finance their Reliability Network Upgrades only.

¹²⁴ Existing tariff section 40.4.6.1; existing tariff Appendix AA, section 6.3.2. The deliverability study identifies limiting transmission facilities and then maximizes the output of generation to produce the highest flows on the facility. The study then scales down all generation in the CAISO BAA to balance load and resources.

values.¹²⁵ The deliverability studies identify transmission constraints that generally are expected to constrain generation regardless of where power is scheduled to go.

Undeliverable capacity cannot count as RA Capacity per section 40.4.6.1 of the CAISO tariff. Similarly, undeliverable capacity should be ineligible to support a high-priority non-recallable export because the resource cannot deliver its output from its point of interconnection to the aggregate of load simultaneously given all the other energy the deliverable capacity is transmitting. Simultaneously delivering power out of a constrained generation pocket is a first and necessary step before any resource can move to the second step - exporting their output to an intertie. For example, except in rare circumstances, if all or a portion of a resource's energy from its 115 kV point of interconnection is not deliverable to the 500 kV backbone, it will be unable to support an export. Resources that cannot ensure delivery of energy corresponding to their entire designated capacity supporting a high-priority non-recallable export or sustain an hourly block schedule for the entire hour should not back a high-priority non-recallable export.¹²⁶ If the export has high-priority non-recallable status and the designated resource cannot fully support the export, the CAISO must serve the export self-schedule using capacity intended to serve CAISO internal load. This could cause load shedding in tight conditions.

As with the other behavioral rules discussed above, the CAISO cannot implement validation rules by summer 2021 to ensure undeliverable capacity is not supporting a high-priority non-recallable export. Instead, the CAISO must rely on the proposed behavioral rule and potential after the fact referrals to the Commission. Resources will know whether their capacity (or a portion thereof) is deliverable, and they should not willingly support high-priority non-recallable exports with undeliverable capacity. If they are unable to support the export's hourly block schedule, the CAISO must support the schedule with RA Capacity otherwise designated for use by CAISO LSEs, which is an unjustifiable outcome.

¹²⁵ To the extent the deliverability study shows that the QC of a resource is not deliverable in the aggregate of demand under the conditions studied (focusing on the peak) the QC of a resource will be reduced on a MW basis for the capacity that is undeliverable.

¹²⁶ The proposed requirement is similar to a requirement that an external resource cannot qualify as an installed capacity (*i.e.*, RA) resource if it is located in an export-constrained capacity zone or must traverse other import- or export-constrained capacity zones. See New York Independent System Operator, Inc., Manual 4, section 4.9.3.2(iii).

d. Exports Must Designate a Resource Internal to the CAISO

The CAISO clarifies its tariff to state explicitly that high-priority non-recallable exports designate a resource internal to the CAISO to support the export transaction.¹²⁷ Exporters should not designate an import to support a high-priority non-recallable export. A scheduling coordinator properly should schedule this transaction as a self-schedule wheeling through transaction, which has specific requirements under the CAISO tariff.¹²⁸ This is consistent with the tariff definition and bidding rules for wheeling through transactions.¹²⁹ The proposed tariff provision codifies existing CAISO practice.

e. Designated Resources Supporting a High-Priority Export Must Participate in RUC up to the Export Self-Scheduled Quantity

The CAISO proposes to require designated resources supporting a high-priority non-recallable export to participate in RUC up to the export self-scheduled quantity. If a supporting resource does not receive an IFM schedule equal to or greater than the corresponding high-priority non-recallable export quantity, the supporting resource must submit a RUC availability bid of \$0.00/MWh up to the export self-schedule quantity.¹³⁰ The scheduling coordinator for the designated supporting resource may submit a RUC availability bid higher than \$0.00/MWh for any MW quantities greater than the quantity of the high-priority non-recallable export.

The following example illustrates the CAISO's proposal. Assume a scheduling coordinator submits a 150 MW high-priority non-recallable export self-schedule in the IFM. The designated resource backing the export may submit an economic bid or a self-schedule in the IFM. Assume further the resource backing the high-priority non-recallable export submits a high economic bid in the IFM, which results in the resource having an IFM schedule of 0 MW. Under these circumstances, the CAISO would need to commit an additional 150 MW of physical capacity in RUC to support the high-priority non-recallable export.

¹²⁷ New tariff section 30.5.1(ee).

¹²⁸ Existing tariff section 30.5.4.

¹²⁹ Existing tariff Appendix A defines Wheeling Through as "the use of the CAISO Controlled Grid for the transmission of energy from outside the CAISO Controlled Grid for delivery to a point outside the transmission and Distribution System of a Participating TO." See *also* existing tariff section 30.5.4.

¹³⁰ New tariff section 30.5.1(bb).

Because the IFM schedule of the designated resource is less than the high-priority non-recallable export schedule, to ensure the designated resource clears RUC, it must submit a \$0/MWh RUC availability bid up to the high-priority non-recallable self-schedule amount, *i.e.*, 150 MW. The resource may submit a RUC availability bid higher than \$0/MWh for quantities above 150 MW.¹³¹

In RUC, the CAISO must meet overall demand, which includes both forecasted CAISO load plus high-priority non-recallable exports. The CAISO may need additional physical supply in RUC because the IFM cleared with virtual supply that will be unavailable in real-time, or the IFM cleared load at a MW quantity less than the CAISO's load forecast (which the CAISO must clear in RUC). Because resources bidding into RUC are essentially offering into a pool of resources to satisfy overall demand, requiring the designated resource to participate in RUC ensures RUC will have sufficient RA Capacity and designated resources to clear the CAISO load forecast and high-priority non-callable exports. Requiring the designated resource to submit a \$0/MWh RUC availability bid ensures RUC can access the designated resource if the CAISO needs additional physical capacity. This enables RUC to consider resources backing a high-priority export and RA Capacity supporting CAISO load equally when evaluating the resources needed to meet overall demand (*i.e.*, the CAISO load forecast and high-priority non-recallable exports). In addition, it aligns with the existing requirement for RA Capacity to participate in in RUC and submit \$0/MWh RUC availability bids.¹³² Both resource types have already sold their capacity to a LSE. Allowing such resources to submit a non-\$0/MWH RUC availability bid would essentially cause LSEs to double pay for the capacity by paying for it again in RUC. Further, absent this bidding rule resources designated to support high-priority non-recallable exports could submit high RUC availability bids to avoid being committed in the RUC optimization to serve their share of overall demand (which includes the high-priority non-recallable export). This could inappropriately cause the market to use RA Capacity to support the high-priority non-recallable export rather than the resource designated to support it. The proposed rule ensures the capacity designated to serve the high-priority non-recallable export is committed in the RUC if necessary to meet that export.

f. Real-Time Market Rules for Capacity Backing High-Priority Non-Recallable Exports

¹³¹ The CAISO can use a designated resource's RUC availability bids above the high-priority non-recallable export amount to meet CAISO forecasted load requirement in RUCs. If this "excess" capacity receives a RUC award, the CAISO needs the capacity to meet CAISO load in real-time, and such capacity cannot support a real-time high-priority non-recallable export. The CAISO discusses this requirement in the next sub-section.

¹³² The CAISO may need bid-in RA Capacity to meet its load forecast in RUC.

The CAISO proposes real-time market rules for high-priority non-recallable exports to ensure the resources supporting them are available to the real-time market. First, scheduling coordinators for resources supporting high-priority non-recallable exports must submit real-time energy Bids for a quantity equal to or greater than the MW quantity of the corresponding high-priority non-recallable export.¹³³ If the scheduling coordinator does not submit such a real-time market energy Bid, the export's real-time market scheduling priority will be equivalent to a day-ahead low-priority recallable export¹³⁴ (*i.e.*, lower priority than CAISO load but higher priority than new low-priority recallable exports submitted in the real-time market).

This requirement works in conjunction with the separate requirement that the supporting resource be available and physically capable of backing the high-priority non-recallable export schedule.¹³⁵ If the original resource supporting a high-priority non-recallable export does not submit a bid in the real-time market, the export scheduling coordinator must designate a different eligible resource in the real-time market to maintain the export's high-priority non-recallable status.

The existing tariff does not require a scheduling coordinator to have a supporting resource in the real-time market because all exports receiving a RUC schedule automatically have a scheduling priority higher than load in real-time. Absent the proposed rules requiring designated resources to be available and submit bids in the real-time market, the CAISO might have to use RA Capacity to support the high-priority non-recallable export. The proposed rule ensures actual, designated capacity is available in real-time to back the high-priority non-recallable export.

The CAISO also proposes that if a designated resource clears RUC for more than the high-priority non-recallable export quantity, the cleared quantity above the high-priority non-recallable export amount cannot support a high-priority non-recallable export in real-time.¹³⁶ Such capacity already cleared RUC to serve CAISO internal load. It would be inappropriate to "take back" that capacity in real-time to support a high-priority non-recallable export.

¹³³ New tariff section 30.5.1(cc).

¹³⁴ This is appropriate because such export and a low-priority recallable export originally scheduled in the day-ahead market are similarly situated. If the circumstances facing the export in real-time existed in the day-ahead market, the export would have been ineligible for high-priority non-recallable export status.

¹³⁵ New tariff section 30.5.1(aa).

¹³⁶ New tariff section 30.5.1(dd).

The following example illustrates this proposal in conjunction with the RUC rules discussed above. Assume a high-priority non-recallable export RUC schedule is 100 MW. If the designated resource's RUC schedule is less than 100 MW, the resource must submit real-time market bids up to the high-priority non-recallable export quantity to maintain the high-priority non-recallable export's RUC schedule. If the designated resource's RUC schedule exceeds 100 MW, then the amount above 100 MW cannot support an incremental real-time high-priority non-recallable export in the real-time market. Therefore, if the resource has a RUC schedule of 105 MW, 100 MW would support the high-priority non-recallable export and 5 MW would be for CAISO use. If the high-priority non-recallable export increases its energy bids above its RUC schedule in the real-time market (e.g., from 105 MW to 120 MW), the incremental real-time high-priority non-recallable export receives high priority for the extra 15 MW. If the designated resource only bids 105 MW in real-time, there would be insufficient capacity to support the additional 15 MW of high-priority non-recallable export.¹³⁷

The CAISO notes other BAAs generally do not use their system pool of resources to enable a specific resource-backed export when the supporting resource becomes unavailable.¹³⁸ For example, PJM Interconnection, L.L.C. (PJM), the New York Independent System Operator, Inc. (NYISO), and ISO New England Inc. (ISO-NE) have established principles regarding installed capacity (ICAP) supported by external resources in one of the other two BAAs. Under these principles, they can curtail an export of ICAP capacity if the ICAP resource becomes unavailable.¹³⁹ In addition, there is a scheduling principle that the energy associated with any ICAP purchase must be backed by operating capacity.¹⁴⁰

¹³⁷ The Revised Final Proposal discusses how exports can obtain high-priority non-recallable export status in real-time. Attachment G, Revised Final Proposal at 20-21. It also provides export priority examples.

¹³⁸ For example, at the January 12 Load and Export Scheduling Workshop the representative from Idaho Power noted that "If a third-party generator schedules an export that is not supported by its resource output, that customer is subject to curtailment." Idaho Power Slide Presentation, at slide 10. As explained in the Revised Final Proposal (at 12-13), the CAISO understands this practice and other practices of other BAAs are not necessarily documented in their OATTs.

¹³⁹ ISO-NE Manual M-20, Attachment B, at Northeast MOU General ICAP Principles, Curtailment Principles I b).

¹⁴⁰ *Id.* at Scheduling Principles I.

3. Tariff Revisions to Facilitate High-Priority Recallable Exports from Partial Resource Adequacy Resources

The CAISO also proposes tariff clarifications regarding the treatment of resource derates when only a portion of a resource's capacity is CAISO RA Capacity. These tariff revisions will enable Partial RA resources to support high-priority non-recallable exports when there is a partial outage or derate on the resource. Providing this functionality is challenging because there are multiple "flavors" of non-RA Capacity. The non-RA portion of a partial RA resource can be capacity the resource: (1) did not sell to any LSE; (2) sold to a CAISO LSE but was not shown to meet that LSE's RA requirements for a particular month; (3) sold to an external LSE that needs to be exported. Under the current framework, the CAISO only knows the general allocation of a resource's capacity as RA or non-RA. It does not know in which of the three categories that non-RA portion falls. Without this information, the CAISO cannot determine if the non-RA portion of a derated partial RA resource can support a high-priority non-recallable export.

The CAISO proposes tariff revisions to obtain the information necessary to perform a more granular allocation of derated capacity and, thus, determine what portion of a derated resource can support a high-priority non-recallable export. The CAISO will require scheduling coordinators requesting planned outages for their resources to notify the CAISO at the time of the outage request whether and to what extent the Outage affects RA Capacity and any contracted non-RA Capacity, *i.e.*, categories 2 and 3 above.¹⁴¹ The scheduling coordinator must also notify the CAISO of any changes to this information. The CAISO will utilize this information in (1) allocating any planned outage derate between RA Capacity and capacity contracted as non-RA and (2) determining RA Substitute Capacity requirements.

The CAISO also proposes to require that when a scheduling coordinator reports a derate to the CAISO as a Forced Outage, the scheduling coordinator must inform the CAISO how the derated capacity should be allocated between RA Capacity and the non-RA Capacity it has sold, *i.e.*, categories 2 and 3 above.¹⁴² Until the scheduling coordinator provides the CAISO the information requested in proposed CAISO tariff section 9.3.10.2, the CAISO will allocate any partial derate based on the information the scheduling coordinator provided the CAISO under section 30.5.1(aa). If the scheduling coordinator has indicated capacity from its RA resource is backing a self-schedule of exports at scheduling points explicitly sourced by non-RA Capacity, the CAISO will allocate the derate *pro rata* between the RA Capacity and the remainder of the resource's capacity

¹⁴¹ Revised tariff sections 9.3.1.3.1 and 9.3.1.3.2.

¹⁴² New tariff section 9.3.10.3.2.

up to its PMax.

The CAISO's proposal will allow it to obtain the information necessary to allocate capacity derates properly and effectively among the types of capacity. This will facilitate prorated high-priority non-recallable exports following partial outages/derates on units.

The CAISO notes its revisions to tariff sections 40.6.6, 9.3.1.3.1, 9.3.1.3.2, 9.3.10.3.2, and the first sentence in new tariff section 30.5.1(aa) are interdependent and not severable from each other. However, they are severable from all other elements of this filing.

These examples illustrate the proposal. A 400 MW unit has 300 MW of RA Capacity and thus 100 MW of non-RA Capacity. The scheduling coordinator requests a planned outage that will derate the unit's capacity to 300 MW. If the scheduling coordinator advises the CAISO that it should attribute 75 MW of the derate to the RA Capacity on the unit and 25 MW to a sale to an external LSE (for export), the CAISO will treat the derated unit as having 225 MW of RA Capacity and 75 MW of capacity sold to a non-CAISO LSE. Thus, the scheduling coordinator will need to provide 75 MW of substitute capacity to enable the planned outage. The derated resource can support a high-priority non-recallable export of 75 MW, and the scheduling coordinator will need to provide 25 MW of capacity from another resource if it desires to maintain its full export schedule of 100 MW.

Using the same resource with the same RA/non-RA split, assume the scheduling coordinator advises the CAISO that 75 MW of the derate should be attributed to the RA Capacity, 10 MW to the external sale, and 15 MW to unsold capacity. The scheduling coordinator would need to provide 75 MW of substitute capacity to support the planned outage request (but 15 MW could come from the unsold capacity). The derated unit could support a high-priority non-recallable export of 90 MW, and the scheduling coordinator would need to provide 10 MW of capacity from another resource if it desires to maintain its full export schedule of 100 MW.

Assume the same unit has a partial derate (Forced Outage) of 100 MW. The CAISO will apply the scheduling coordinator's allocation provided under tariff section 9.3.10.3.2 as soon as practicable. However, until that time, the CAISO will allocate the capacity based on the scheduling coordinator's representations under section 30.5.1(aa). If the scheduling coordinator has advised the CAISO that it sold capacity to an external LSE (for export), the CAISO will prorate the derate between the RA Capacity and the capacity sold externally. Specifically, the CAISO will allocate 75 percent of the derate to the RA Capacity (3/4ths of the unit was RA). Thus, the scheduling coordinator will need to provide substitute capacity of 75 MW to avoid potential RAIM charges. The derated unit will

support a high-priority non-recallable export of 75 MW, and the scheduling coordinator will need to provide 25 MW of capacity from another resource if it desires to maintain its full high-priority non-recallable export schedule of 100 MW.

B. Proposed Scheduling Priorities for Wheeling Through Self-Schedules

The CAISO's final set of tariff revisions addresses wheeling through self-schedule priorities. The priority provided wheeling through transactions could greatly affect the CAISO's ability to serve native load. The CAISO is particularly concerned about these effects for summer 2021 given tight supply conditions and an expected increase in wheeling transactions. The CAISO's concerns are heightened because it does not reserve capacity for native load customers unlike other transmission providers. The CAISO worked hard with stakeholders to address the complex, challenging, and polarizing issues associated with wheeling through priorities.

The CAISO sought to develop a solution for summer 2021 that effectively balances the needs of both the CAISO's native load customers and external entities seeking to use the CAISO system to serve their load and follows general open access principles, recognizing the unique nature of the CAISO's market framework. To achieve this result the CAISO proposes, on an interim basis, through May 31, 2022, to establish two categories of wheeling through self-schedule transactions – a Priority Wheeling Through and a non-Priority Wheeling Through. Priority Wheeling Through transactions will have a priority equal to CAISO load and high-priority non-recallable exports in the day-ahead and real-time market optimization processes. Non-Priority Wheeling Through transactions will have a lower priority. The CAISO discusses its proposal in detail below and demonstrates why it is a just and reasonable interim solution to a difficult issue.

1. The Commission's Open Access Policies Allow the Prioritization of Intertie and Internal Capacity to Ensure Reliable Service to Native Load

One of the "core elements" of the Commission's open access policies is the ability of transmission providers to include in their tariffs certain protections to ensure reliable service to native load customers.¹⁴³ In Order No. 888, the Commission gave public utilities the right to reserve existing transmission

¹⁴³ See, e.g., *Preventing Undue Discrimination and Preference in Transmission Service*, Notice of Proposed Rulemaking, 71 FR 32,636 (Jun. 6, 2006), FERC Stats. & Regs. ¶ 32,603, at P 4 (2006).

capacity needed for native load and network transmission customer load growth reasonably forecasted within the utility's current planning horizon.¹⁴⁴ In rejecting arguments to eliminate native load protections in Order No. 890, the Commission emphasized the importance of native load protections:

We conclude that the native load priority established in Order No. 888 continues to strike the appropriate balance between the transmission provider's need to meet its native load obligations and the need of other entities to obtain service from the transmission provider to meet their own obligations.¹⁴⁵

Native load protections under the Commission's open access policies can take several forms. Transmission providers use ATC to determine the amount of capability available in the transmission network to accommodate requests for transmission service.¹⁴⁶ As the Commission has explained:

All ATC calculation methodologies derive ATC by modeling the system to establish TTC [total transfer capability], expressed in terms of contract paths or flowgates, and reducing that figure by existing transmission commitments (*i.e.*, ETC), a margin that recognizes uncertainties with transfer capability (*i.e.*, TRM [transmission reliability margin]), and a margin that allows for meeting generation reliability criteria (*i.e.*, CBM).¹⁴⁷

¹⁴⁴ *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Servs. By Pub. Utils.; Recovery of Stranded Costs by Pub. Utils. & Transmitting Utils.*, Order No. 888, FERC Stats. & Regs. ¶ 31,036, at 31,694 (1996) (Order No. 888), *order on reh'g*, Order No. 888-A, FERC Stats. & Regs. ¶ 31,048 (Order No. 888-A), *order on reh'g*, Order No. 888-B, 81 FERC ¶ 61,248 (1997), *order on reh'g*, Order No. 888-C, 82 FERC ¶ 61,046 (1998), *aff'd in relevant part sub nom. Transmission Access Policy Study Group v. FERC*, 225 F.3d 667 (D.C. Cir. 2000), *aff'd sub nom. New York v. FERC*, 535 U.S. 1 (2002).

¹⁴⁵ *Preventing Undue Discrimination & Preference in Transmission Serv.*, Order No. 890, FERC Stats. & Regs. ¶ 31,241, at P 107 (Order No. 890), *order on reh'g*, Order No. 890-A, FERC Stats. & Regs. ¶ 31,261 (2007) (Order No. 890-A), *order on reh'g*, Order No. 890-B, 123 FERC ¶ 61,299 (2008) (Order No. 890-B), *order on reh'g*, Order No. 890-C, 126 FERC ¶ 61,228, *order on clarification*, Order No. 890-D, 129 FERC ¶ 61,126 (2009).

¹⁴⁶ Order No. 890 at P 2 n.3.

¹⁴⁷ Order No. 890 at P 209. To avoid confusion with the term "ETC" as defined in the CAISO tariff to refer to Existing Transmission Contracts, in this transmittal letter the CAISO will use the full term "existing transmission commitments" to refer to the ATC component as described in the Commission's open access orders.

From the start of open access transmission service in the mid-1990s, the Commission has recognized transmission providers can preserve internal capacity and import capacity to ensure reliable service to native load and to use in emergency conditions. The *pro forma* OATT contained in Order No. 888 included an Attachment C with a one-line placeholder stating the transmission provider was to file its methodology for assessing ATC as part of its filed OATT. The Commission recognized as part of that ATC assessment, a transmission provider can reserve CBM as an import set-aside from ATC. For example, in considering and rejecting comments opposing MISO's proposed methodology to assess ATC due to aspects of the CBM set-aside proposed by the Midwest Independent System Operator, Inc. (later renamed the Midcontinent Independent System Operator, Inc.) (MISO), the Commission noted, "CBM is a term used to describe import capacity at interties of neighboring systems that is set aside to access generation reserves during contingencies."¹⁴⁸

In Order No. 888 and subsequently, the Commission has highlighted the ability of transmission providers to use the existing transmission commitment reservation process to reserve transfer capability to safely and reliably serve its native load. The Commission found in Order No. 888 "[t]he transmission provider may reserve in its calculation of ATC transmission capacity necessary to accommodate native load growth reasonably forecasted in its planning horizon."¹⁴⁹ Transmission providers must post transmission capacity reserved for future native load growth and make it available until LSEs serving native load need the capacity.¹⁵⁰ Similarly, the Commission explained in Order No. 888-A "the transmission provider is responsible for planning and maintaining sufficient transmission capacity to safely and reliably serve its native load. Order Nos. 888 and 889 permit the transmission provider to reserve, in its calculation of ATC, sufficient capacity to serve native load."¹⁵¹

In Order Nos. 890 and 890-A, the Commission continued to find it appropriate to give public utilities "the right to reserve existing transmission capacity needed for native load growth reasonably forecasted within the utility's current planning horizon."¹⁵² Again, consistent with this finding, the *pro forma* version of Attachment C in Order No. 890 states "[f]or [existing transmission commitments], a transmission provider shall explain . . . the calculation methodology used to determine the transmission capacity to be set aside for

¹⁴⁸ *Midwest Indep. Transmission Sys. Operator, Inc.*, 98 FERC ¶ 61,075, at 61,215 (2002).

¹⁴⁹ Order No. 888, FERC Stats. & Regs. ¶ 31,036, at 31,694 (1996).

¹⁵⁰ *Id.*

¹⁵¹ Order No. 888-A at 30,279.

¹⁵² Order No. 890 at PP 95, 107, *reh'g denied in relevant part*, Order No. 890-A at PP 23-24.

native load (including network load).” Similarly, orders that are more recent support granting native load priority for transmission service.¹⁵³

In Order No. 890, the Commission concluded it needed to revisit Order No. 888’s generic requirement to include in OATTs an ATC assessment methodology. Therefore, the Commission directed transmission providers to “develop consistent methodologies for ATC calculation and to publish those methodologies to increase transparency.”¹⁵⁴ Order No. 890 included new *pro forma* Attachment C requiring transmission providers to specify in Attachment C to their tariffs certain minimum information used in their methodologies for assessing ATC. That minimum information includes the transmission provider’s explanation of the existing transmission commitments component of its ATC calculation -- “the calculation methodology used to determine the transmission capacity to be set aside for native load (including network load).”¹⁵⁵ However, the Commission gave transmission providers some latitude in stating what their ATC methodologies consist of, *e.g.*, each transmission provider may, but is not required to, set aside transfer capability for CBM in its ATC methodology.¹⁵⁶ The CAISO understands most transmission providers, including many in the Western Interconnection, set aside capacity in their ATC calculations to ensure reliable service to native load as either CBM or an existing transmission commitment.¹⁵⁷

¹⁵³ See, *e.g.*, *Sierra Pac. Power Co. v. NV Energy, Inc.*, 143 FERC ¶ 61,144, at P 112 (2013) (finding that “Network Integration Transmission Service expressly recognizes the underlying right of the transmission provider to use its network resources to serve its native load needs, including through economic dispatch of those network resources”); *Duke Energy Corp.*, 166 FERC ¶ 61,112, at P 13 (2019) (internal citation omitted) (finding that the “distinction between native and non-native load recognizes the obligation public utilities undertake to engage in long-term system planning on behalf of certain customers in exchange for those customers taking requirements service and contributing to the fixed costs of the supplier’s system”).

¹⁵⁴ Order No. 890 at P 2. Congress, in Section 1233 of EPOA 2005, added section 217 to the FPA, entitled “Native Load Service Obligations,” which addressed transmission rights held by LSEs. FPA section 217 allows LSEs to use their own and contracted-for transmission capacity to deliver energy as required to meet their service obligations, without being subject to charges of unlawful discrimination. The Commission noted its reforms in Order No. 890 were consistent with FPA section 217. *Id.* at P 107.

¹⁵⁵ Attachment C to Commission *pro forma* OATT, at section 3(b).

¹⁵⁶ See Order No. 890 at PP 207-13, 313-72 and *pro forma* Attachment C; Order No. 890-A at PP 106-28; Order No. 890-B at PP 7-37.

¹⁵⁷ See, *e.g.*, Attachment C to Arizona Public Service Company OATT, at sections 1 and 3(b)(i) (defining Existing Transmission Commitments in relevant part as “the sum of existing firm commitments for the path” and “the firm capacity set aside to serve peak Native Load forecast commitments”); Attachment C to NV Energy OATT, at sections 1.2.2 and 1.2.6 (defining Existing Transmission Commitments in relevant part as “[t]he sum of existing firm commitments for the ATC Path” and “the firm capacity set aside to serve peak Native Load forecast commitments”); Attachment C to PacifiCorp OATT at definitions and section 3(b)(ii) (defining Existing

Under the Commission's standard *pro forma* OATT, transmission providers provide both firm and non-firm service. Firm point-to-point transmission service has the same reservation priority as service to native load customers.¹⁵⁸ The capacity available for non-firm point-to-point service expressly excludes capacity reserved for reliable service to native load customers. Section 14.2 of the *pro forma* OATT, first established in Order No. 888 and retained (with non-substantive modifications) in Order No. 890 provides:

Non-Firm Point-To-Point Transmission Service shall be available from transfer capability in excess of that needed for reliable service to Native Load Customers, Network Customers and other Transmission Customers taking Long-Term and Short-Term Firm Point-To-Point Transmission Service.¹⁵⁹

The OATTs of most transmission providers that offer non-firm transmission service contain this provision.

2. ISO and RTO Tariffs Include Provisions Reserving Capacity to Ensure Reliable Service to Native Load

Consistent with the Commission's open access policies and precedent, other independent system operators (ISOs) and regional transmission organizations (RTOs)¹⁶⁰ have provisions in their tariffs permitting them to reserve capacity to ensure reliable service to their native load. Those native load protections are contained in several types of tariff provisions.

Transmission Commitments in relevant part as “[c]ommitted uses of a Transmission Provider’s Transmission System considered when determining ATC” and “the firm capacity set aside to serve peak Native Load forecast commitments”); Attachment C to Bonneville Power Administration OATT (defining Existing Transmission Commitments in relevant part as “the committed uses of the system, which include the firm and non-firm capacity set aside to serve Point-To-Point Service Agreements, Network Integration Service Agreements, pre-Order 888 grandfathered agreements, and other commitments made pursuant to the Transmission Provider’s statutory and treaty obligations”); and Attachment C to Salt River Project Agricultural Improvement and Power District OATT, at sections 1 and 1.3 (defining “Committed Uses” as the sum of TRM and Existing Transmission Commitments (including CBM),” with Existing Transmission Commitments and CBM defined therein to include “Native Load Uses”).

¹⁵⁸ See Commission *pro forma* OATT, section 13.2.

¹⁵⁹ Commission *pro forma* OATT, section 14.2.

¹⁶⁰ See ISO-NE OATT, sections II.20.2 and II.30.2.

First, both PJM¹⁶¹ and MISO¹⁶² have tariff provisions governing the assessment of ATC allowing them to preserve a CBM for imports during emergency conditions. By preserving a CBM for imports, those PJM and MISO tariff provisions protect native load when and if emergency conditions arise.

Further, PJM,¹⁶³ Southwest Power Pool, Inc. (SPP),¹⁶⁴ and the NYISO¹⁶⁵ all have tariff provisions reserving a certain amount of existing transmission commitments for native load. Thus, those tariffs ensure the ISO/RTOs' ATC methodologies protect native load.

In addition, section 14.2 of the PJM, MISO, and SPP tariffs include the provision derived from the Commission's *pro forma* OATT excluding transfer capability "needed for reliable service to Native Load Customers" from the capacity available for non-firm service in non-firm service reservation priorities.¹⁶⁶ Thus, those ISO/RTO tariffs explicitly specify transfer capability will be set aside

¹⁶¹ Attachment C to the PJM OATT states that "Firm ATC on any path will be limited to assure that emergency import capability will be available to Network Customers when needed through the reservation of capacity benefit margin, equivalent to a firm point-to-point transmission service reservation for delivery from systems outside of the PJM Region to serve the load serving entities within such region."

¹⁶² Attachment C to the MISO Tariff (at section 4.1) states that "MISO will utilize CBM that is needed only when experiencing a declared NERC Energy Emergency Alert ("EEA") 2 or higher." Section 4 of Attachment C to the MISO Tariff states that, under MISO's CBM methodology, "[a] Loss of Load Expectation ('LOLE') study is used to determine the Generation Capacity Import Requirement ('GCIR') of a CBM study zone."

¹⁶³ Attachment C to the PJM OATT defines existing transmission commitments as "committed use of the transmission system," including "native load commitments."

¹⁶⁴ Attachment C to the SPP OATT (at section 4.5) references existing transmission commitments as the "transmission capability utilized in serving native load commitments, to include native load growth, load forecast error and losses not otherwise included in TRM or CBM." Attachment C to the SPP OATT (at sections 3.1.1 and 3.1.2) defines existing transmission commitments as including, among other things, the sum of flows due to firm and non-firm schedules "into, out of and through the SPP Balancing Authority Area."

¹⁶⁵ Attachment C to the NYISO OATT (at sections 9.2 and 9.3) defines existing transmission commitments as the sum of "existing firm commitments" and existing non-firm commitments" for each interface. A component of the calculation of existing transmission commitments is "the firm capacity set aside to serve peak Native Load forecast commitments for the time period being calculated, to include losses, and Native Load growth, not otherwise included in Transmission Reliability Margin or Capacity Benefit Margin." NYISO OATT, attachment C, section 9.4.

¹⁶⁶ For example, MISO tariff Module B 14.1.6.000, Section 14.12 Reservation Priority states: "Non-Firm Point-to-Point Transmission Service shall be available from transfer capability in excess of that needed for service to Native Load Customers, Network Customers, and other Transmission Customers taking Long-Term and Short-Term Firm Point-to-Point Transmission Service."

to provide reliable service to native load customers, and only excess transfer capability is available for non-firm point-to-point transmission service.

In sum, these various tariff provisions allow ISOs and RTOs to reserve capacity to ensure reliable service to its native load, often through multiple tariff mechanisms. Any capacity available for wheeling through and other transactions is subject to these native load reservations.

3. The CAISO Does Not Reserve Capacity to Ensure Reliable Service to Native Load

The Commission has found the CAISO's existing framework for accommodating service requests and market bids just and reasonable and compliant with Order No. 890.¹⁶⁷ However, to be clear, the CAISO tariff contains none of the traditional mechanisms the Commission has accepted for other transmission providers to set aside capacity to serve native load. Unlike many ISOs and RTOs, the CAISO definition of the existing transmission commitments (defined as ETComm in the tariff) component of the ATC calculation does not include native load commitments.¹⁶⁸ The CAISO's methodology to calculate ATC set forth in Appendix L to the CAISO tariff does include a CBM component, but further provides "[t]he CAISO does not use CBMs" and as a result "[t]he CBM value is set at zero."¹⁶⁹

Unlike the tariffs of other ISOs and RTOs and many transmission providers, the CAISO tariff also does not provide for making non-firm service available for transfer capability "in excess of that needed for reliable service to Native Load Customers."¹⁷⁰ As explained above,¹⁷¹ the CAISO has only one category of transmission service not associated with existing rights such as

¹⁶⁷ See, e.g., *Cal. Indep. Sys. Operator Corp.*, 123 FERC ¶ 61,180 (2008) (accepting CAISO filing to comply with Order No. 890 subject to further compliance filing), *order on further compliance filing*, 126 FERC ¶ 61,316 (2009).

¹⁶⁸ Existing tariff Appendix L, section L.1.3.

¹⁶⁹ Existing tariff Appendix L, section L.1.6.

¹⁷⁰ See Commission *pro forma* OATT, section 14.2.

¹⁷¹ See *supra* section II of this transmittal letter.

Existing Transmission Contracts (ETCs) and TORs¹⁷² – new firm use.¹⁷³ The CAISO does not use transmission reservations to manage the priority of schedules to address system constraints. Instead, the CAISO manages schedules on its grid through the day-ahead and real-time markets and applies scheduling priorities defined in its tariff to ration capacity when demand for transfer capability exceeds supply.

Also, in its transmission planning process, the CAISO does not account or plan for wheeling through transactions other than some firm entitlements associated with ETCs and TORs, which are not affected by this filing. Wheeling Through transactions are not firm entitlements.

4. Recent Tight Supply Conditions in the West Have Highlighted the Need for the CAISO to Reserve Capacity for Reliable Service to Native Load

The CAISO's current tariff framework – with only a single classification of transmission service and with no reservation of capacity to serve native load – worked in the past. Historically, the CAISO has rarely needed to curtail schedules. More recent tight supply conditions in the Western Interconnection, however, show why the CAISO must act now to fulfill its obligations to native load customers. The challenges of such tight supply conditions were highlighted by the historic heat wave affecting the western United States for several consecutive days in mid-August 2020, causing energy supply shortages that led to rotating power outages in the CAISO footprint on August 14 and 15. Among other things, the Final Root Cause Analysis identified actions to prepare the region for summer 2021 without having to resort to rotating power outages, including establishing appropriate prioritization of export and wheeling schedules.¹⁷⁴

Increased wheeling through transactions could exacerbate the reliability challenges the CAISO faced last August because the existing CAISO tariff does not distinguish among wheeling through self-schedules. Today, the CAISO treats all wheeling transactions similarly in setting its scheduling parameters. It is

¹⁷² Existing Transmission Contracts are “[t]he contracts which grant transmission service rights in existence on the CAISO Operations Date (including any contracts entered into pursuant to such contracts) as may be amended in accordance with their terms or any agreement between the parties thereto from time to time.” Existing tariff, Appendix A. A Transmission Ownership Right is “[t]he ownership or joint ownership right to transmission facilities within the CAISO Balancing Authority Area of a Non-Participating TO that has not executed the Transmission Control Agreement, which transmission facilities are not incorporated into the CAISO Controlled Grid.” *Id.*

¹⁷³ See existing tariff, section 23.

¹⁷⁴ See Final Root Cause Analysis at 1-2.

possible, that in the most critical hours, if faced with significant wheeling through volumes, the CAISO markets would prioritize very short-term wheeling through schedules over serving CAISO native load, making it more challenging for the CAISO to avoid shedding load. In other regions, such short-term wheeling through transactions might be scheduled with non-firm transmission service and appropriately receive a lower scheduling priority. On the other hand, the CAISO's current framework allows wheeling through self-schedules for only one hour in a month to displace self-scheduled RA Capacity CAISO LSEs have procured and shown in annual and monthly RA Plans as necessary to meet CAISO load. This construct undermines the CAISO's ability to serve load reliably based on the RA Capacity LSEs have procured to serve their load.

Moreover, any self-scheduled wheeling through transaction, no matter how firm, receives priority service not only on the interties but also on internal CAISO BAA transmission paths. The CAISO's analysis shows when Path 26 is constrained in the north-to-south direction, self-scheduled wheeling through transactions occupy capacity on Path 26, preventing capacity from RA resources north of Path 26 from serving load in the southern part of the CAISO BAA. The high priority afforded to all self-scheduled wheeling through transactions can thus unduly limit the CAISO's ability to use these resources to satisfy reliability needs within the CAISO footprint. Entities built these RA resources in northern California to serve CAISO native load, and CAISO LSEs are paying for them. It is unfair and inconsistent with the native load protections contemplated in Order Nos. 888 and 890 that wheeling through transactions can "crowd out" capacity the CAISO needs from internal RA resources to serve its native load reliably. Given the extremely tight supply conditions the CAISO faces this summer, rendering these internal resources inaccessible could be the difference between shedding native load and not shedding it.

If left unaddressed, the current framework could jeopardize the CAISO's ability to serve native load reliably during emergency conditions this summer, potentially forcing the CAISO to shed load. It is critical the CAISO have reasonable measures in place to address this situation more effectively. CAISO LSEs depend entirely on the CAISO system to access RA Capacity.

The CAISO's concerns about wheeling through transactions displacing the RA Capacity needed to serve native load reliably are elevated because the CAISO expects an increased number of wheeling through transactions this summer. Several factors drive this expectation. The 2020 heatwave affected other parts of the West, and the CAISO understands some BAAs have changed their procurement practices to access more power from external sources. The CAISO is aware some external BAAs intend to wheel energy through the CAISO system more than they have previously. Many factors support this. First, summer 2021 power future prices in the Southwest significantly exceed prices in the Northwest. Second, the CAISO changed its business practice manual after

last August's events to provide high-priority recallable exports a higher priority in the real-time market only up to their RUC schedules (not their IFM schedules). Because of this change, market participants can no longer rely on the ability to export from the CAISO grid based on their exports cleared in the IFM. The CAISO understands this may cause neighboring LSEs to secure capacity outside of the CAISO and wheel it through the CAISO system instead of relying on exports procured in the IFM. Third, the CAISO proposes herein to tighten its rules regarding the capacity that can support high-priority non-recallable exports and reduce the real-time scheduling priority of low-priority recallable exports.¹⁷⁵ The CAISO expects these conditions will also drive external LSEs to increase their use of wheeling through transactions, potentially affecting the CAISO's ability to meet its native load obligations on peak demand days in the West.

5. The CAISO Has Developed a Fair, Temporary Proposal That Strikes an Appropriate Balance Between the Need to Serve Native Load and the Desire of Other Entities to Obtain Wheeling Through Service on the CAISO Controlled Grid

Based on current supply conditions in the Western Interconnection, including the risk of additional power outages, the CAISO has determined it is appropriate to revise the relative priorities of wheeling schedules – on an interim basis – to ensure reliable service to native load customers in the CAISO BAA while still maintaining open access to its transmission system. Establishing priorities for wheeling through self-schedules vis-à-vis CAISO native load self-schedules was contentious, and stakeholders were deeply divided. Some stakeholders believe the conditions the CAISO is placing on Priority Wheeling Through transactions are overly restrictive. On the other hand, some stakeholders in the CAISO footprint assert the CAISO is not going far enough to reserve capacity for native load or fulfill the principles of Order Nos. 888 and 890. The CAISO believes its interim solution is fair, balanced, and just and reasonable. It minimizes potential native load reductions, while recognizing certain external BAAs may be relying on wheeling through transactions to serve their own load this summer.

As described in more detail in Section III.B.7(a)-(b) *infra*, the proposed tariff revisions establish two priorities of wheeling through self-schedules and assign a higher scheduling priority to Priority Wheeling Through transactions meeting specified criteria. The criteria, described in detail below, generally

¹⁷⁵ The MSC Opinion recognizes “the proposed changes in curtailment of spot market exports for summer 2021 could result in external BAs making more use of wheel-through transactions than they have in the past, particularly extreme high load conditions when there is a potential for exports not supported by non-RA capacity to be curtailed.” MSC Opinion at 11.

require Priority Wheeling Through transactions be supported by a verified firm power supply contract for the entire month and monthly firm transmission during on-peak periods to serve the load of an external LSE. Priority Wheeling Through transactions will have a scheduling priority in CAISO market runs equal to the priority of self-scheduled RA imports to serve load internal to the CAISO. The scheduling priorities established by this filing prevent non-Priority Wheeling Through transactions from displacing the delivery of power needed to avoid shedding CAISO native load. The CAISO also proposes a new procedure it would apply after the HASP runs to allocate transmission over constrained transmission capacity between Priority Wheeling Through transactions and serving CAISO load. The CAISO will apply this procedure when an Intertie is constrained in the import direction by a scheduling limit or Path 26 is constrained in the north-south direction, and HASP cannot meet CAISO Forecast of CAISO Demand or fully accommodate a Priority Wheeling Through transaction.

The CAISO's proposal is consistent with the Commission's recognition that terms of service under OATTs should "strike the appropriate balance between the transmission provider's need to meet its native load obligations and the need of other entities to obtain service from the transmission provider to meet their own obligations."¹⁷⁶ The CAISO's proposal reserves capacity to serve native load similar to the tariffs of other ISOs and RTOs. The CAISO's proposal accomplishes this through somewhat different methods than those other ISOs and RTOs, but it achieves the same objective of reserving capacity for reliable service to native load. Thus, the CAISO's proposal is akin to measures that meet the "consistent with or superior to" standard for complying with the Commission's open access requirements under Order No. 890.¹⁷⁷ The CAISO's proposal arguably is more favorable to external entities than the frameworks of other transmission providers who reserve firm transmission capacity for native load in their initial ATC calculations as an Existing Transmission Commitment prior to identifying the amount of transmission available to use for other transactions, including wheels.

The CAISO proposal does not reserve capacity – it merely assigns native load a priority higher than lower-priority wheeling through schedules in

¹⁷⁶ Order No. 890 at P 107.

¹⁷⁷ In Order No. 890, the Commission explained that "nothing in [Order No. 890] is intended to upset the market designs used by existing ISOs and RTOs" and that the "CAISO – like any other ISO or RTO – has the opportunity to demonstrate that a variation from the tariff revisions adopted in [Order No. 890] satisfies the consistent with or superior to standard." *Id.* at PP 158, 160. The Commission's application of this standard can take into account the unique tariff structure or market design of an ISO or RTO. See, e.g., *N.Y. Indep. Sys. Operator Corp., Inc.*, 123 FERC ¶ 61,134, at P 13 (2008) ("[W]e recognize that NYISO's proposed deviations from the pro forma OATT reflect the actual market design used by NYISO, and find these deviations to be consistent with or superior to the pro forma OATT, except as otherwise addressed below.").

circumstances where transmission capacity is constrained. As such, the CAISO's proposal likely allows more wheeling through transactions than traditional means of reserving capacity for native load such as CBM or the up-front reservation of existing transmission commitments associated with native load.

During typical system conditions, the CAISO anticipates the proposed changes in wheeling through self-schedule priorities will not change operations. These proposed changes will only determine how the CAISO allocates transmission capacity when key interties or internal paths are extremely constrained – the very conditions likely to occur in imminent or actual System Emergencies. These are precisely the circumstances when it is appropriate to reserve capacity to maintain reliable service to native load customers.

The CAISO's proposal also provides a reasonable and well-defined approach for maintaining the priority of wheeling through transactions relying on the use of the CAISO controlled grid for summer 2021 and part of 2022. To qualify as a Priority Wheeling Through for a given month, the scheduling coordinator must confirm the self-schedule meets the eligibility requirements at least 45 days in advance of the relevant month.¹⁷⁸ The 45-day notice requirement aligns with the requirement that CAISO LSEs make RA supply plan showings 45 days before the month. As described in more detail below, a scheduling coordinator for a Priority Wheeling Through must confirm a firm power supply contract and firm transmission to serve an external LSE's load for the entire calendar month. This demonstrates a level of dependence and commitment to use and pay for the costs of the CAISO grid relatively similar to CAISO LSEs serving native load. CAISO LSEs depend entirely on the CAISO grid to receive service, and their dependence is 24 x 7 x 365. The CAISO proposal provides some level of certainty that external LSEs will be using the CAISO transmission system regularly and paying CAISO transmission charges. As discussed in more detail below, Commission precedent recognizes that, because "external load is situated differently than internal load with respect to its ongoing reliance on the CAISO grid," it is appropriate to require external LSEs to demonstrate their intention to utilize the CAISO transmission system on a regular basis to receive rights comparable to those available to internal load.¹⁷⁹

¹⁷⁸ For July and August 2021, scheduling coordinators must make the showing by June 29, 2021.

¹⁷⁹ *Cal. Indep. Sys. Operator Corp.*, 116 FERC ¶ 61,274, at P 766, *reh'g denied in relevant part*, 119 FERC ¶ 61,076, at P 370.

6. The CAISO Will Implement the Tariff Revisions Regarding Wheeling Through Transactions on an Interim Basis

A key benefit of the CAISO's wheeling through priority proposal is that it is achievable for summer 2021, addressing the critical near-term need to provide reliable service to native load in the coming months when the CAISO anticipates tight supply conditions, and emergency conditions are most likely to arise. The CAISO proposes to sunset the wheeling through tariff revisions effective June 1, 2022. Thus, the wheeling through related tariff revisions will be in effect for only an interim period of approximately eleven months.¹⁸⁰ The CAISO originally proposed to sunset these provisions on December 31, 2021, but in response to stakeholder comments, determined a May 31, 2022, sunset date is appropriate to provide additional time to consider and develop longer-term design changes prior to summer 2022.¹⁸¹

The Commission previously has accepted CAISO revisions on an interim basis to address system reliability concerns while the CAISO was considering longer-term solutions. For example, in 2016, the Commission accepted the CAISO's filing of "revisions to its tariff to address limitations in the natural gas delivery system in southern California that could adversely impact the reliability of CAISO's electric grid and market operations during the summer of 2016."¹⁸² The Commission explained it was accepting the tariff revisions "based on the unique set of circumstances CAISO will face this summer due to the limited operability of the Aliso Canyon natural gas storage facility in southern California."¹⁸³ The Commission allowed the CAISO to implement these tariff revisions on an interim basis, with an express sunset date, subject to the requirement the CAISO seek Commission authorization to extend their effectiveness.¹⁸⁴ The Commission has also accepted tariff revisions to address system reliability concerns on an interim basis in other proceedings.¹⁸⁵ The Commission should accept the tariff revisions

¹⁸⁰ Sunsetting these tariff revisions will occur automatically due to how the CAISO has submitted them in the Commission's eTariff system.

¹⁸¹ The CAISO must make a Section 205 filing to extend the proposed wheeling through provisions beyond May 31, 2022 if it believes the interim measures remain needed until it can implement a more durable solution. The CAISO can also make a Section 205 filing to implement different measures.

¹⁸² *Cal. Indep. Sys. Operator Corp.*, 155 FERC ¶ 61,224, at P 1 (2016).

¹⁸³ *Id.* at P 2.

¹⁸⁴ *Id.* at P 13.

¹⁸⁵ See, e.g., *ISO New Eng. Inc., et al.*, 144 FERC ¶ 61,204, at P 42 (2013) (stating that "given the importance of ensuring reliability in New England this coming winter . . . we accept the [proposed Winter Reliability] Program for the limited period requested," subject to "consider[ation]

regarding Priority Wheeling Through transactions on an interim basis for similar reasons.

The CAISO has commenced a stakeholder initiative to identify and implement a long-term solution that will enable external entities to obtain firm transmission for wheeling through schedules on a forward basis. The CAISO aims to request approval by its Governing Board of the proposals developed in that stakeholder initiative, and to file a tariff amendment to implement the proposals by summer 2022.¹⁸⁶ Until the CAISO completes that initiative and can implement any new market measures, the CAISO requires the proposed interim tariff revisions to ensure reliable service to native load during emergency-type conditions.

7. The Proposed Tariff Revisions Are Just and Reasonable

a. New Definition of a Priority Wheeling Through

Effective on an interim basis from June 28, 2021 through May 31, 2022, the CAISO proposes to include a new defined term in Appendix A to its tariff: “Priority Wheeling Through,” which means a wheeling through self-schedule that meets three specified criteria.¹⁸⁷

First, a firm power supply contract to serve the load of an external LSE for the entire calendar month must support the Priority Wheeling Through transaction.¹⁸⁸ This criterion is analogous to the existing requirement that scheduling coordinators for LSEs must procure a specified amount of RA

of] market-based solutions” in future stakeholder process); *ISO New Eng. Inc.*, 171 FERC ¶ 61,235, at PP 1, 57 (2020) (finding that implementation of proposed tariff revisions on an interim basis for winter months over upcoming two-year period “is a reasonable short-term solution to compensating in a technology-neutral manner resources that provide fuel security”).

¹⁸⁶ See [California ISO - Maximum import capability enhancements \(caiso.com\)](https://www.aiso.com/California-ISO-Maximum-import-capability-enhancements). Specifically, as the linked website page explains, in that initiative the CAISO will discuss stakeholder concerns about potential improvements to calculating maximum import capability and the process used to allocate and track it during the RA process. The scope of the stakeholder initiative also includes developing a process that would permit wheeling through self-schedules to reserve import capability and transmission across the CAISO system, and the associated review of wheeling through priorities when accessing the CAISO system.

¹⁸⁷ Effective June 1, 2022, the tariff will no longer include this defined term or the related tariff provisions.

¹⁸⁸ Tariff Appendix A, new definition of “Priority Wheeling Through.”

Capacity to meet their monthly RA obligation and show it to the CAISO in a monthly RA Plan.¹⁸⁹

Second, monthly firm transmission from the source to the CAISO boundary, for Hours Ending 07:00 through 22:00, Monday through Saturday, excluding NERC holidays, must support the Priority Wheeling Through transaction.¹⁹⁰ The specified hours for which the external LSE is required to procure monthly firm transmission are the peak demand hours as defined by NAESB.¹⁹¹

CAISO LSEs depend entirely on the CAISO transmission system and pay the embedded costs of the system through a transmission access charge. They are unable to receive energy from remote supplies absent using the CAISO grid. The CAISO essentially intends the Priority Wheeling Through eligibility requirement that external LSEs procure monthly firm transmission as a proxy for CAISO LSEs' dependence on the CAISO grid. External LSEs' procurement of monthly firm transmission upstream of the CAISO border for the peak period indicates their commitment to rely on using the CAISO system (and paying CAISO transmission charges) to deliver power to their internal loads on a regular basis, similar to (but not as extensive as) the grid use of CAISO native load.

The monthly firm transmission requirement for a Priority Wheeling Through transaction is comparable to the existing situation where the CAISO allocates CRRs that offset transmission congestion costs to CAISO LSEs that pay transmission access charges, but LSEs in external BAAs are allocated CRRs only if they pre-pay a transmission service charge (*i.e.*, a wheeling access charge).¹⁹² In approving this prepayment requirement, the Commission explained:

external load is situated differently than internal load with respect to its ongoing reliance on the CAISO grid. If an LSE with external

¹⁸⁹ See Existing tariff section 40.2.2.4.

¹⁹⁰ Tariff Appendix A, new definition of "Priority Wheeling Through Self-Schedule." The firm transmission hours generally align with the concept of "heavy load hours" in the Western Interconnection. See, e.g., <https://www.ppcpdx.org/industry-info/glossary/> <https://www.bpa.gov/Finance/RateCases/InactiveRateCases/BP12/Final%20Proposal/BP-12-FS-BPA-03.pdf>. The proposal also tracks the CAISO definition of peak-period CRRs. Business practice manual for CRRs, Attachment A (which includes a link to the NAESB Business Practices).

¹⁹¹ See [Additional Off-peak Days.pdf \(nerc.com\)](#) and the link to the NAESB document therein.

¹⁹² See existing tariff section 36.9.2.

load intends to continue to use the CAISO grid as a means of serving its load, pre-payment of the wheeling access charge is not unduly discriminatory. By making this pre-payment, that LSE signals its intention to continue to utilize the CAISO transmission system, and is therefore eligible, like an LSE serving internal load, to participate in the CRR allocation process.¹⁹³

Likewise, the proposed monthly firm transmission requirement signals the intention of a scheduling coordinator with a Priority Wheeling Through transaction to utilize the CAISO transmission system in concert with firm transmission service to the boundary of the CAISO system.¹⁹⁴

Further, the monthly firm transmission requirement recognizes external LSEs reasonably invested to rely on the CAISO system to serve their native load. Their procuring firm transmission suggests they are committed to, and depend on, using the CAISO system to serve their native load regularly. The robustness of the monthly firm transmission requirement will prevent cherry-picking whereby a wheeling through self-schedule can occur in just one peak hour and crowd out native load during the time native load most needs to use the CAISO system.

The monthly firm transmission requirement is not, however, a transmission reservation requirement. It simply is a proxy to “measure” to determine if external LSEs are relying on the CAISO system treatment somewhat comparably to CAISO LSEs. Wheeling through transactions not meeting the monthly power supply contract and firm transmission service eligibility requirements will simply have a lower priority in the day-ahead and real-time market optimization.

The third criterion for a Priority Wheeling Through transaction is that the scheduling coordinator must confirm that it meets criteria (1) and (2) above and notify the CAISO of the power supply contract MW supporting the export self-schedule of the Priority Wheeling Through transaction, sufficiently before the

¹⁹³ *Cal. Indep. Sys. Operator Corp.*, 116 FERC ¶ 61,274, at P 766, *reh'g denied in relevant part*, 119 FERC ¶ 61,076, at P 370.

¹⁹⁴ The requirements the CAISO proposes are less stringent than the requirements an external LSE must satisfy to obtain an allocation of CRRs. In that situation, in addition to showing they have existing energy contracts with internal resources, external LSEs must demonstrate that they have historically utilized the CAISO transmission system. The CAISO also must verify their historical usage of the CAISO grid and their existing contracts. Further, external LSEs must prepay wheeling access charges to demonstrate they plan to take transmission service from the CAISO. Here, external LSEs may obtain priority wheeling through service without demonstrating historical usage, without CAISO verification, without already executed power supply contract, and, without prepaying wheeling charges.

month in which the Priority Wheeling Through will start.¹⁹⁵ For a Priority Wheeling Through transaction that will start in July or August of 2021 (*i.e.*, soon after the tariff revisions are implemented), the scheduling coordinator must provide the information described above by June 29, 2021. This tariff amendment provides notice to all entities interested in priority wheeling schedules for July and August 2021 that they will need to provide the information by June 29. For Priority Wheeling Through transactions in September 2021 and months thereafter, the scheduling coordinator must provide the information 45 days before the month. This 45-day requirement is analogous to the existing obligation on CAISO LSEs under the RA program to provide a monthly RA Plan to the CAISO at least 45 days before the start of the month.¹⁹⁶ As discussed in Section III.B.8.a below, in response to stakeholder feedback, the CAISO revised the timing for scheduling coordinators to meet qualifications for a Priority Wheeling Through to align more closely with the monthly RA showing requirements.

It is just and reasonable to require the scheduling coordinator to satisfy these three criteria to demonstrate its wheeling through self-schedule is of sufficient firmness, duration, and veracity to qualify as a Priority Wheeling Through.

b. Tariff Revisions to Specify Scheduling Priorities for Wheeling Through Self-Schedules

Any wheeling through self-schedule not satisfying one or more of the three criteria listed above will be a non-Priority Wheeling Through transaction. Thus, for the interim effectiveness of these tariff revisions, there will be two types of wheeling through self-schedules: Priority Wheeling Through transactions, which have a higher priority for scheduling purposes, and non-Priority Wheeling Through transactions, which have a lower priority.

Effective on an interim basis through May 31, 2022, the CAISO will reflect these higher and lower scheduling priorities in revisions to tariff section 31.4 (for the IFM) and tariff section 34.12 (for the real-time market). Specifically, to effectuate this priority scheme in the IFM, the export leg of a Priority Wheeling Through transaction will have a scheduling priority equal to the scheduling priority of a Self-Schedule of CAISO Demand and high-priority non-recallable exports¹⁹⁷ with lower scheduling priorities assigned to the export leg of a non-

¹⁹⁵ New tariff section 30.5.1(z). Effective June 1, 2022, the tariff will no longer include this section.

¹⁹⁶ See existing tariff sections 40.2.1(a), 40.2.2.4(b), 40.4.7.1(b), and 40.10.5.2(c)(3).

¹⁹⁷ Revised tariff section 31.4(e). Except as otherwise specified below in this subsection (b)

Priority Wheeling Through transaction.¹⁹⁸ Similarly, the import leg of a Priority Wheeling Through transaction will have higher priority¹⁹⁹ than the import leg of a non-Priority Wheeling Through transaction.²⁰⁰

The CAISO's market software determines the priority order in which it curtails self-schedules using market parameters known as "penalty prices." Determining priority order for wheeling through self-schedules is unique because they consist of both an import self-schedule and an export self-schedule. The market has a constraint to ensure wheeling through transactions remain balanced (*i.e.*, the import quantity equals the export quantity). This constraint respects the penalty prices associated with curtailing both the import self-schedule and the export self-schedule. These penalty factors are additive.

To provide Priority Wheeling Through transactions the same priority as self-scheduled CAISO load in market optimization, the export leg of a Priority Wheeling Through will have a scheduling priority equal to self-schedules of CAISO Demand in the IFM and a scheduling priority equal to meeting the CAISO load forecast in the RUC process and real-time market. The export leg of a Priority Wheeling Through will also have the same scheduling priority as a high-priority non-recallable export. The import leg of a Priority Wheeling Through will have a scheduling priority equal to self-scheduled imports. The combined effect of the scheduling priorities of the export and import legs give Priority Wheeling Through transactions an equal priority in the market to a self-scheduled import needed to meet CAISO load.

The CAISO will set the import leg of a non-Priority Wheeling Through transaction to \$0 through a parameter in the business practice manual. In the majority of instances, combining the export and import leg priorities will provide non-Priority Wheeling Through transactions a lower scheduling priority than serving CAISO load. The proposed post-HASP process (described *infra*) will address any non-Priority Wheeling Through transactions that clear HASP if the CAISO cannot serve its load.

These tariff revisions will ensure the highest-priority wheeling through self-schedules have the same priority as a self-scheduled RA import needed to serve load internal to the CAISO. In addition, the proposed revisions add specificity to the tariff regarding wheeling through self-schedule priorities – an element that is

of this transmittal letter, references to revised tariff sections herein mean tariff sections that will be in effect only from July 1, 2021 through May 31, 2022.

¹⁹⁸ Revised tariff section 31.4(f).

¹⁹⁹ Revised tariff section 31.4(h).

²⁰⁰ Revised tariff section 31.4(i).

missing in the current tariff and effectuated only through application of parameters in in the business practice manual.

Reflecting the interim nature of the CAISO's proposal, effective June 1, 2022, the CAISO proposes to remove the references in tariff sections 31.4, 34.12.1, 34.12.2, and 34.12.3 to scheduling priorities for Priority Wheeling Through and non-Priority Wheeling Through transactions. Like the existing tariff, these tariff sections will not mention wheeling through self-schedule priorities effective June 1, 2022.

c. Tariff Revisions to Implement Post-HASP Process to Allocate Transmission Capacity Fairly to Ensure Reliable Operations

Existing tariff section 34.12.2 states that the dispatch priorities "as defined in the RTM [real-time market] optimization may be superseded by operator actions and procedures as necessary to ensure reliable operations." Effective on an interim basis from through May 31, 2022 (*i.e.*, while Priority Wheeling Through transactions are in effect), the CAISO proposes to supplement this existing tariff language to describe a new post-HASP process to allocate constrained import and internal transmission between Priority Wheeling Through transactions and supply needed to serve native load.

The market can produce inequitable results because RA imports are not required to self-schedule. They can also submit economic bids. The market may schedule wheeling through transactions, including non-Priority Wheeling Through transactions, instead of scheduling these imports needed to meet CAISO native load. There can be instances where a non-Priority Wheeling Through transaction can clear the HASP, preventing the CAISO from serving its native load. In addition, a higher quantity of Priority Wheeling Through transactions can clear the HASP, causing CAISO load to receive an insufficient share of the transmission capacity needed to serve native load. The market can also cause wheeling through schedules to displace RA Capacity needed to serve CAISO load if Path 26 becomes congested.

The new process is necessary to ensure a proportionate allocation because the market solution using penalty prices alone may not produce such an allocation. When the market must reduce submitted self-schedules or not meet load, and the relevant penalty prices the optimization is considering are the same, many potential solutions are possible. The market optimization schedules supply and demand with the objective of minimizing overall costs. However, various potential self-schedule amounts or load reductions can have the same overall costs, leading to many potential solutions. In addition, other factors such as transmission losses can cause the market to reduce self-schedules unevenly.

Thus, it is unlikely the market will *pro rata* allocate constrained capacity between Priority Wheeling Through transactions and transactions needed to serve native load.

The post-HASP process will appropriately allocate limited transmission capability between Priority Wheeling Through transactions and supply needed to serve native load. During some stressed conditions when the CAISO is at risk of shedding load, it is inappropriate to allocate limited transmission capacity to non-Priority Wheeling Through transactions to the detriment of the CAISO serving its native load. CAISO LSEs rely on available transmission capacity and make RA import procurement decisions in advance based on the CAISO's assessment of available import capability and tariff rules governing its assignment to them.²⁰¹ Non-Priority Wheeling Through transactions indicate no commitment to, or dependence on, using the CAISO grid routinely on a monthly basis. Such opportunity-type transactions should not have a priority equal to native load or Priority Wheeling Through transactions. It is inappropriate to jeopardize serving native load by providing limited capacity to entities that fail to demonstrate dependence on the CAISO system ahead of time. The allocation process also reduces potential adverse effects on system reliability by ensuring non-Priority Wheeling Through transactions do not prevent RA Capacity north of Path 26 from serving load south of Path 26. Furthermore, it allows the CAISO to provide access to external entities that have shown their dependence on the CAISO grid ahead of time based on their investments to secure capacity and supply to serve their load.

Specifically, if an intertie scheduling point is constrained in the import direction or Path 26 is congested in the north-south direction, and the HASP cannot meet CAISO forecast demand or fully accommodate a Priority Wheeling Through transaction, the CAISO will perform a post-HASP process to allocate ATC between supply needed to meet CAISO load and Priority Wheeling Through transactions *pro rata*.²⁰² Under the proposed tariff provisions, the CAISO load share is the lower of each applicable RA resource's real-time energy bid quantity or its shown RA Capacity. The Priority Wheeling Through *pro rata* share for each self-schedule will be based on the lowest of (1) 110 percent of the submitted day-ahead market self-schedule of the Priority Wheeling Through transaction,²⁰³ (2)

²⁰¹ See existing tariff section 40.44.6.2 *et seq.* (the Maximum Import Capability or MIC tariff provisions).

²⁰² Revised tariff section 34.12.3. Effective June 1, 2022, the tariff will no longer include these tariff provisions.

²⁰³ This provision incentivizes Priority Wheeling Through transactions to participate in the day-ahead market. Priority Wheeling Through transactions scheduling only in the real-time market can create reliability issues because they displace at the last minute needed import supply

the submitted real-time market self-schedule of the Priority Wheeling Through transaction, or (3) the Priority Wheeling Through quantity requested 45-days in advance of the month. The ATC the CAISO awards to Priority Wheeling Through transactions in the post-HASP process cannot exceed the Priority Wheeling Through quantity the CAISO calculates in this *pro rata* allocation. If RUC cannot schedule sufficient capacity to meet the RUC Procurement Target, the CAISO will issue a RUC Award or RUC Schedule to imports providing RA Capacity for the full amount of their RA Capacity.²⁰⁴

The following provides a numerical example of the post-HASP allocation process. Assume the import limit is 4000 MW in both the day-ahead and real-time market. In the day-ahead market, there are 2000 MW of Priority Wheeling Through transactions scheduled. In the real-time market, the submitted Priority Wheeling Through transactions are 2500 MW, which is less than the quantity requested 45 days in advance. There are 2000 MW of RA Capacity bidding in the real-time market equal to the shown RA Capacity. In addition, 1000 MW of non-RA Capacity imports bid into the real-time market. The Priority Wheeling Through transactions claim to import capability is limited to 110 percent of the day-ahead schedule or 2200 MW. The CAISO load entitlement claim on import capability is limited to the RA Capacity of 2000 MW. The Priority Wheeling Through transactions *pro rata* share is $2200 \text{ MW} / (2000 \text{ MW} + 2200 \text{ MW})$ of the 4000 MW import limit which is 2095 MW. The CAISO would curtail self-schedules of the Priority Wheeling Through transactions to 2095 MW. The CAISO load *pro rata* share of the 4000 MW import limit would be 1905 MW, *i.e.*, $2000 \text{ MW} / (2000 \text{ MW} + 2200 \text{ MW})$. The CAISO will schedule the additional imports and internal generation that did not clear the HASP in merit order up to 1905 MW.

The CAISO will settle energy scheduled via the post-HASP process as exceptional dispatch energy. This recognizes the post-HASP process may have to increase schedules by accepting “out-of-economic-merit-order” bids. It is possible the adjustment will reallocate transmission capacity from Priority Wheeling Through transactions to imports and internal generation that submitted economic bids but the HASP did not select. If the HASP cuts Priority Wheeling Through transactions, the HASP locational marginal price (LMP) at the scheduling point is $-\$150/\text{MWh}$. After the adjustment, some imports submitted as economic bids may receive schedules that do not correspond to their bid price. If the congestion persists in subsequent fifteen-minute market (FMM) runs, which is likely, the FMM LMP may be negative, resulting in unfavorable

determined as needed in RUC to meet CAISO reliability needs at the last minute.

²⁰⁴ Revised tariff section 31.5.5. This ensures CAISO load receives an appropriate share of the transmission capability to meet load-serving obligations if the HASP is infeasible by creating a real-time must-offer obligation for RA imports that did not clear the RUC optimization.

settlement for these schedules. However, the CAISO would make these schedule increases to ensure reliability, and consequently they are similar to the exceptional dispatches the CAISO makes in other circumstances under existing tariff section 34.11 to maintain reliability.

The Appendices to the Revised Final Proposal include additional examples illustrating application of the post-HASP process, including when there is north to south congestion on Path 26.²⁰⁵

As discussed in Section III.B.8 below, to address concerns raised by stakeholders, the CAISO revised several elements of the proposed post-HASP process.

8. The CAISO Proposal on Scheduling Priorities for Wheeling Through Self-Schedules Appropriately Addresses Stakeholder Feedback

During the stakeholder process, the CAISO refined its proposal to address stakeholder feedback. Some stakeholders expressed support for the proposed tariff revisions. Other stakeholders raised issues with the proposal or opposed the proposal entirely or in part. The CAISO addresses many of the more significant stakeholder issues in the following discussion.

a. Responses to Comments on the Definition of a Priority Wheeling Through

Early in the stakeholder process, the CAISO proposed that one criterion for a Priority Wheeling Through transaction should be that the wheeling through self-schedule is supported by a firm power supply contract to serve load in another BAA entered into prior to the date this tariff amendment was filed. Some stakeholders objected to this proposal arguing it gave them insufficient notice of the need for a firm power supply contract. They also argued this imposed more onerous requirements on external LSEs than the RA requirements for CAISO LSEs. In response, the CAISO eliminated this criterion and now instead proposes to require the scheduling coordinator to have such a contract in place by June 29, 2021, for Priority Wheeling Through transactions in July and August 2021, and 45 days before the month in which the Priority Wheeling Through transaction will start for subsequent months.²⁰⁶ This change aligns the eligibility requirements for Priority Wheeling Through transactions with the 45-day in advance monthly showing requirement for RA supply.

²⁰⁵ Revised Final Proposal, provided as Attachment G to this filing at 48-51.

²⁰⁶ See *supra* section III.B.1(a) of this transmittal letter.

Some stakeholders also expressed concern that requiring notification 45 days before the month, for September 2021 and afterwards, gives them an insufficient margin for error. However, this 45-day time period is identical to the existing 45-day time period for LSEs to submit monthly RA Plans. Thus, the CAISO does not believe allowing 45 days will be problematic.²⁰⁷

A few stakeholders suggested the CAISO should change the requirements to be eligible for Priority Wheeling Through transaction to include contracts to serve load outside the CAISO BAA for any portion of the month along with firm transmission service for the hours reflected in the power supply contract. There are several reasons such changes are unjustified. First, this would undermine the CAISO's objective of aligning Priority Wheeling Through eligibility with the monthly RA showings required for CAISO LSEs. CAISO LSEs must meet their RA obligations for the entire month, not a subset of the month. Second, the suggested change would allow wheeling through self-schedules to crowd out native load during anticipated peak need periods, essentially allowing external entities to "cherry pick" when to use the system, in contrast to CAISO LSEs that depend on the CAISO system, and must pay for its embedded costs, every hour of every day of the month. Third, the suggestion ignores that CAISO LSEs must procure sufficient RA Capacity each month to meet their monthly peak obligation, and most of that capacity has a 24 x 7 must-offer obligation. Granting a high priority to wheeling through transactions supported by power supply contracts to serve external load for some unspecified period "during the applicable month" is wholly incomparable to the RA obligations of CAISO LSEs, and it does not evince an intent to rely regularly on the CAISO grid to serve load like a CAISO LSE.

This change would also contravene a core principle of the CAISO's proposal – the Commission's recognition that, because "external load is situated differently than internal load with respect to its ongoing reliance on the CAISO grid," external LSEs should demonstrate their intention to utilize the CAISO transmission system on a regular basis in order to receive rights comparable to those provided internal load.

b. Responses to Comments on the Scheduling Priorities for Wheeling Through Transactions

Stakeholders expressed concern some scheduling priority alternatives the CAISO considered earlier in the stakeholder process might make wheeling through capacity unavailable for external LSEs that either have procured firm

²⁰⁷ Stakeholders also ignore that CPUC-jurisdictional LSEs must show they have procured at least 90 percent of their RA obligations for the summer months (May-September) by October 31 of the prior year. These showings can include import supply arrangements.

supplies or were considering such supplies they intend to wheel through the CAISO to serve their native load. In response, the CAISO crafted the proposal in this filing – namely, that Priority Wheeling Through Self-Schedules will have a scheduling priority equal to the scheduling priority of a self-scheduled RA import to serve load internal to the CAISO in both the IFM and the real-time market. This will reasonably accommodate neighboring BAAs that are utilizing out-of-BAA supplies, combined with firm transmission, to meet a portion of their native load obligations, without significantly undermining appropriate native load protections for CAISO BAA native load.

Some stakeholders objected to the proposal to give any scheduling priority to wheeling through self-schedules on the grounds there is no policy (or tariff) basis for the proposal, the proposal is unfair to native load, and the proposal could block RA resources from serving load during emergency conditions. They also asserted that the proposal is contrary to the native load priority and treatment of network resources under Order No. 888.

The CAISO believed it was inappropriate to implement these less accommodative measures for summer 2021. As explained above,²⁰⁸ the CAISO might adjust wheeling through self-schedules based on the scheduling priorities set forth in tariff sections 31.4 and 34.12, as revised by this filing, if capacity is constrained. The CAISO's proposal follows the Commission's recognition in Order No. 890 that open access transmission service should strike the appropriate balance between the transmission provider's need to meet its native load obligations and the need of other entities to obtain service from the transmission provider to meet their own obligations. The CAISO's proposal seeks a balanced approach that recognizes some external BAAs have arranged to serve a portion of their native load using wheeling through transactions. Although the CAISO acknowledges the native load protections promulgated in Order Nos. 888 and 890, the CAISO seeks to implement a more measured approach for the interim period.

On the other hand, different stakeholders argued the CAISO's proposal violates open access and does not sufficiently protect wheeling through transactions. The proposal does not violate open access. As discussed above, the CAISO's proposal is consistent with general open access principles, including the native load priority articulated in Order Nos. 888 and 890. These stakeholders ignore that under the CAISO's proposal, the CAISO grid is "open" daily to all market participants that seek to use it, just as it is today. On a daily basis any scheduling coordinator – whether it represents supply, load, exports, or wheeling through transactions – can submit a bid/self-schedule for service.

²⁰⁸ See *supra* section III.B.2 of this transmittal letter.

The CAISO is not precluding wheeling through transactions on its system. The CAISO's proposal merely establishes the scheduling priorities it will apply in the day-ahead and real-time market optimization processes during extremely tight conditions if the market does not solve, and it needs to adjust self-schedules. Scheduling priorities are not a new concept in the CAISO tariff – they already exist in tariff sections 31.4 and 34.12 for different types of transactions. However, these tariff sections do not reference the scheduling priorities for wheeling through self-schedules. The CAISO now seeks to establish such priorities and to create two classes of wheeling through self-schedules. The proposed priorities are fair and offer reasonable protections to native load. Importantly, the CAISO is not giving native load a higher priority than Priority Wheeling Through transactions; it is giving native load the same priority.

Consistent with the Commission's open access principles, the CAISO's proposal balances the transmission provider's need to meet its native load obligations and the desire of other entities to obtain service from the transmission provider to meet their own obligations. Other transmission providers (including other ISOs/RTOs) address curtailment-related issues through measures such as CBM, reservation of capacity for native load as existing transmission commitments, different categories of transmission service with different curtailment priorities, and NERC Transmission Loading Relief standards.²⁰⁹ Energy sellers (including the merchant arms of regulated public utilities) similarly implement varying curtailment/supply interruption provisions in their sales contracts, distinguishing between firm and non-firm energy, which they may interrupt or recall for any number of reasons, including reliability or economics. The CAISO is not foreclosing use of its system; it is merely prioritizing the allocation of capacity if tight conditions occur, just as every other transmission provider does. The CAISO's proposed measures are comparable in effect, but not identical in form, to the native load protections maintained by other ISOs, RTOs, and transmission providers. The CAISO's proposal reflects the unique nature of its services and markets – no transmission reservations, no classes of transmission service, and a volumetric wheeling through rate. The CAISO handles all scheduling priorities through the penalty parameters in the market optimization. Accordingly, the CAISO's proposal establishes the relative priority of native load and other uses of the transmission system through a scheduling priority based on the market's application of penalty prices. This does not violate open access or any other fundamental principle.

Some stakeholders expressed concern the CAISO's proposal is unduly discriminatory because it does not treat wheeling through customers identically to internal CAISO load and import RA transactions. There is no reasonable basis

²⁰⁹ Also, as discussed above, other transmission providers "carve-out" and preserve capacity for native load before even making capacity available for other transmission services.

for those concerns. Over the course of the stakeholder process for the tariff amendment, the CAISO changed its proposal to address stakeholder comments, easing the requirements for Priority Wheeling Through transactions to accommodate the needs of LSEs outside the CAISO BAA. The resulting proposal gives equal scheduling priority to Priority Wheeling Through transactions and self-scheduled RA imports to serve load internal to the CAISO. The proposal protects native load consistent with the non-discriminatory open access requirements in Order Nos. 888 and 890. It also follows the Commission's prior findings that external LSEs and internal CAISO LSEs are not similarly situated. The CAISO's proposal presents a fair and balanced interim solution given the unique circumstances here and the clear need to maintain reliability on the CAISO during summer 2021.

Section 205 of the FPA prohibits a public utility from "mak[ing] or grant[ing] any *undue* preference or advantage to any person or subject[ing] any person to any *undue* prejudice or disadvantage."²¹⁰ So long as there is no undue preference or discrimination, the public utility satisfies the requirements of section 205.²¹¹ The CAISO's proposal is not unduly discriminatory. Again, it simply makes justified distinctions in the scheduling priorities set forth in tariff sections 31.4 and 34.12 to protect native load reasonably in emergency conditions.

c. Response to Comments Regarding the New Post-HASP Process

The CAISO had initially proposed to base the *pro rata* allocation in the post-HASP process on the maximum of the total RA imports in the real-time and RUC imports. Some stakeholders expressed concern this would improperly prioritize CAISO imports beyond RA commitments. The CAISO recognized this concern and modified the proposal so that the post-HASP *pro rata* allocation will use only the amount of RA import bids (including self-schedules) in the real-time market.²¹²

²¹⁰ FPA Section 205(b), 16 U.S.C. § 824d(b) (emphasis added).

²¹¹ *Calpine Corp. v. PJM Interconnection, L.L.C.*, 171 FERC ¶ 61,035, at P 318 (2020) ("Whether a rate or practice is unduly discriminatory depends on whether it provides different treatment to different classes of entities and turns on whether those classes of entities are similarly situated"). See also *Town of Norwood v. FERC*, 202 F.3d 392, 402 (1st Cir. 2000) ("But differential treatment does not necessarily amount to *undue* preference where the difference in treatment can be explained by some factor deemed acceptable to regulators (and the courts).") (emphasis in original).

²¹² The MSC Opinion recognizes the CAISO made this change to reflect a comparable priority between RA imports and Priority Wheeling Through transactions. MSC Opinion at 14.

Several stakeholders and DMM suggested the CAISO should add a day-ahead must-offer obligation for high-priority wheels given the concern that reliability challenges could arise if the RUC process does not take into account priority wheeling transactions expected in real-time. DMM stated that although it expects scheduling coordinators will schedule few wheeling through transactions in real-time, allowing wheeling through transactions to schedule in real-time only can create uncertainty because they can displace generation needed to serve CAISO load.²¹³ DMM suggested the CAISO could mitigate this uncertainty by requiring wheeling through transactions participate in the day-ahead market in order to have Priority Wheeling Through status.²¹⁴ DMM said this would reduce uncertainty between the day-ahead and real-time markets.²¹⁵ The MSC also recognized that even with the new wheeling through requirements in place circumstances could arise where Priority Wheeling Through transactions and RA imports exceed an intertie's total transfer capacity.²¹⁶

The CAISO responded to this concern by adding a provision that limits the incremental Priority Wheeling transactions scheduled in the real-time market it can consider in the post-HASP *pro rata* reduction process. If the Priority Wheeling through fails to participate in the day-ahead market, the CAISO will miss an opportunity to address the impact of these schedules in the day-ahead timeframe. This could produce unreliable day-ahead schedules and force the CAISO to address the infeasibilities in the real-time when the CAISO has fewer options. Therefore, to ensure that the bulk of the priority wheels will be scheduled in the day-ahead market, the post-HASP *pro rata* process for priority wheels will be based on the lesser of (1) 110 percent of the submitted day-ahead market priority wheel self-schedule, (2) the submitted real-time market priority wheel self-schedule, or (3) the priority wheel quantity requested 45 days in advance of the month. Further, the CAISO will cap the ATC it awards to Priority Wheeling Through transactions in the post-HASP process so it cannot exceed the Priority Wheeling Through quantity the CAISO calculates in the *pro rata* allocation.

The proposed Priority Wheeling Through quantity the CAISO will use in the post-HASP process reflects stakeholder and DMM's input. Although the

²¹³ Comments of DMM on Revised Tariff Language, citing Comments of DMM on Final Proposal.

²¹⁴ *Id.* The CAISO notes that, by comparison, RA resources have a day-ahead must-offer obligation.

²¹⁵ *Id.*

²¹⁶ MSC Opinion at 13.

CAISO did not adopt their specific recommendations, its proposed post-HASP allocation process responds to their concerns and will encourage scheduling coordinators to schedule Priority Wheeling Through transactions in the day-ahead.

d. Response to Comments on Stakeholders' Proposed Alternatives

Some stakeholders propose alternatives to the CAISO's proposal regarding scheduling priority for wheeling through self-schedules, *e.g.*, implementing an approach based on ATC reservations or CBM or implementing a TAC prepayment scheme that allocates capacity to wheeling through transactions (like the CRR process). The CAISO cannot implement these alternatives this summer. In any event, the Commission need not, and should not consider these proposed alternatives if raised in comments filed in response to this tariff amendment.

The matter before the Commission is to determine whether the CAISO's proposal, not any proposed alternative, is just and reasonable. "Pursuant to section 205 of the FPA, the Commission limits its evaluation of a utility's proposed tariff revisions to an inquiry into 'whether the rates proposed by a utility are reasonable – and not to extend to determining whether a proposed rate schedule is more or less reasonable to alternative rate designs.'"²¹⁷ Therefore, "[u]pon finding that CAISO's Proposal is just and reasonable, [the Commission] need not consider the merits of alternative proposals."²¹⁸ The CAISO and stakeholders will consider options for a longer-term solution in the newly commenced stakeholder initiative. Because the CAISO cannot develop and implement such a solution by the summer of 2021, the CAISO is proposing the tariff revisions regarding wheeling priorities on an interim basis, to ensure reliability of service to native load this summer through May 2022.

²¹⁷ *Cal. Indep. Sys. Operator Corp.*, 141 FERC ¶ 61,135, at P 44 n.43 (quoting *City of Bethany v. FERC*, 727 F.2d 1131, 1136 (D.C. Cir. 1984)). In that same order, the Commission also explained that the revisions proposed by the utility "need not be the only reasonable methodology" and that "even if an intervenor develops an alternative proposal, the Commission must accept a section 205 filing if it is just and reasonable, regardless of the merits of the alternative proposal. 141 FERC ¶ 61,135, at P 44 n.43 (citing federal court and Commission precedent). See also *New Eng. Power Co.*, 52 FERC ¶ 61,090, at 61,336 (1990), *aff'd*, *Town of Norwood v. FERC*, 962 F.2d 20 (D.C. Cir. 1992) (proposed rate design need not be perfect, it merely needs to be just and reasonable); *Louisville Gas & Elec. Co.*, 114 FERC ¶ 61,282, at P 29 (2006) (the just and reasonable standard under the FPA is not so rigid as to limit rates to a "best rate" or "most efficient rate" standard, but rather a range of different approaches often may be just and reasonable).

²¹⁸ *Cal. Indep. Sys. Operator Corp.*, 141 FERC ¶ 61,135, at P 44.

IV. EFFECTIVE DATE OF TARIFF REVISIONS AND INTERIM EFFECTIVENESS OF WHEELING THROUGH TARIFF REVISIONS

To address the risks the CAISO faces in summer 2021, most of the proposed tariff revisions must become effective in July 2021. However, the CAISO requires limited tariff provisions to be effective on June 28, 2021. Therefore, the CAISO respectfully requests the Commission issue an order by June 27, 2021, accepting the proposed tariff revisions effective on the dates the CAISO proposes.

Specifically, the CAISO is submitting three sets of tariff revisions with different effective dates. The first set, consisting of the new defined term Priority Wheeling Through and an eligibility notification provision, will be effective June 28, 2021.²¹⁹ The second set, which contains the other load, export, and wheeling through related tariff revisions, would be effective upon five days advance notice no later than July 15, 2021.²²⁰ This will provide the CAISO and market participants sufficient time to prepare for implementing these changes. The CAISO requests authorization to notify market participants of the effective date of the second set of tariff changes at least five days before implementation.²²¹

Because the CAISO intends all wheeling through related tariff revisions to be interim only, the CAISO is submitting a third set of tariff records that removes all such wheeling through-related provisions from the tariff after May 31, 2022.²²²

²¹⁹ The clean tariff sheets for the first set of tariff revisions are in Attachment A, and the redlined sheets are in Attachment B.

²²⁰ The clean tariff sheets for the second set of tariff revisions are in Attachment C, and the redlined sheets are in Attachment D.

²²¹ See *Cal. Indep. Sys. Operator Corp.*, 172 FERC ¶ 61,263, at Ordering Paragraphs (A) and (C) (2020). The CAISO has included an effective date of 12/31/9998 as part of the tariff records submitted in this filing. The CAISO will notify the Commission of the actual effective date of these tariff records within five business days after implementation in an eTariff submittal using Type of Filing code 150 – Report.

²²² The clean tariff sheets for the third set of tariff revisions are in Attachment E, and the redlined sheets are in Attachment F. Specifically, the CAISO proposes to sunset the following: (1) the definition of Priority Wheeling Through in Appendix A of the CAISO tariff; (2) new tariff section 30.5.1(z); (3) the discussion of the post-HASP process in new tariff section 34.12.3; (4) the tariff revision in section 31.5.5; and (5) the references to Priority Wheeling Through and non-Priority Wheeling Through self-schedules in revised tariff sections 31.4, 34.12.1, and 34.12.2. Regarding removal of the Priority Wheeling Through definition in Appendix A and of tariff record 34.12.3, Systrends does not allow changes to a newly proposed record in the same filing. Therefore, the CAISO will submit a future filing to remove both records in Systrends at least 61 days prior to the June 1, 2022 effective date.

Thus, effective June 1, 2022, the CAISO would revert back to the current tariff provisions that do not specify scheduling priorities for wheeling through transactions

Because the third set of tariff revisions would become effective on June 1, 2022, the CAISO requests the Commission grant waiver of its notice requirement.²²³ The CAISO requests the Commission grant all necessary waivers to allow this. Good cause exists to grant this waiver because the CAISO intends its proposal to implement two categories of wheeling through self-schedules to be interim in nature.

The CAISO has a commenced a new stakeholder initiative to consider more durable measures to address wheeling through priority issues. However, the CAISO may be unable to develop and implement any longer-term measures by June 2022. Thus, the possibility exists the CAISO might seek to extend the wheeling through provisions proposed in this filing or seek to implement other interim measures effective June 1, 2022. Any changes would require the CAISO to submit a new Section 205 filing to supersede the third set of tariff sheets.²²⁴

²²³ Specifically, under Section 35.11 of the Commission's regulations, 18 C.F.R. § 35.11. The CAISO respectfully requests waiver of the notice requirement in section 35.3(a)(1) of the Commission's regulations, 18 C.F.R. §35.3(a)(1), to allow those tariff revisions to go into effect more than 120 days after submittal of this filing.

²²⁴ *Id.*

V. COMMUNICATIONS

Parties should direct any correspondence and other communications regarding this filing should to:

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VI. SERVICE

The CAISO has served copies of this filing on the California Public Utilities Commission, the California Energy Commission, and all parties with scheduling coordinator agreements under the CAISO tariff. In addition, the CAISO has posted a copy of the filing on the CAISO website.

VII. CONTENTS OF FILING

In addition to this transmittal letter, this filing includes the following attachments:

Attachment A	Clean tariff sheets incorporating the first set of revisions described in this filing
Attachment B	Tariff sheets showing in redline format the first set of revisions to the currently effective tariff described in this filing
Attachment C	Clean tariff sheets incorporating the second set of revisions described in this filing ²²⁵
Attachment D	Tariff sheets showing in redline format the second set of revisions to the currently effective tariff described in this filing ²²⁶
Attachment E	Clean tariff sheets incorporating the third set of revisions described in this filing ²²⁷
Attachment F	Tariff sheets showing in redline format the third set of revisions described in this filing ²²⁸
Attachment G	Revised Final Proposal
Attachment H	CAISO Management's Memorandum and Presentation to the CAISO Board regarding the Decision on Market Enhancements for Summer 2021 Readiness – Load, Export, and Wheeling Priorities
Attachment I	Market Surveillance Committee Opinion

²²⁵ Clean tariff sheets for the second set of tariff revisions include the changes from the first tranche as underlying text.

²²⁶ Redlined tariff sheets for the second set of revisions include changes from the first tranche as underlying text.

²²⁷ Clean tariff sheets for the third set of tariff revisions include certain changes from the second tranche as underlying text.

²²⁸ Redlined tariff sheets for the third set of revisions include certain changes from the second tranche as underlying text.

VIII. CONCLUSION

For the reasons set forth in this filing, the CAISO respectfully requests that the Commission accept the proposed tariff revisions effective on the dates proposed herein.

Respectfully submitted,

/s/ Anthony Ivancovich

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Attachment A – Clean Tariff (June 28, 2021)
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021

30.5.1 General Bidding Rules

- (a) All Energy and Ancillary Services Bids of each Scheduling Coordinator submitted to the DAM for the following Trading Day shall be submitted at or prior to 10:00 a.m. on the day preceding the Trading Day, but no sooner than seven (7) days prior to the Trading Day. All Energy and Ancillary Services Bids of each Scheduling Coordinator submitted to the RTM for the following Trading Day shall be submitted starting from the time of publication, at 1:00 p.m. on the day preceding the Trading Day, of DAM results for the Trading Day, and ending seventy-five (75) minutes prior to each applicable Trading Hour in the RTM. Scheduling Coordinators may submit only one set of Bids to the RTM for a given Trading Hour, which the CAISO uses for all Real-Time Market processes. The CAISO will not accept any Energy or Ancillary Services Bids for the following Trading Day between 10:00 a.m. on the day preceding the Trading Day and the publication, at 1:00 p.m. on the day preceding the Trading Day, of DAM results for the Trading Day;

* * * * *

- (x) Scheduling Coordinators can submit Economic Hourly Block Bids with Intra-Hour Option. If accepted in the HASP, such a Bid creates a binding schedule with same MWh awards for each of the four (4) FMM intervals. After that, the RTM can optimize such schedules for economic reasons once through an FMM during the Trading Hour. As specified in Section 11, a cleared Economic Hourly Block Bid with Intra-Hour Option is not eligible for Bid Cost Recovery.
- (y) A Scheduling Coordinator submitting Bids to the RTM is not required to submit a Self-Schedule Hourly Block, a Variable Energy Resource Self-Schedule, an Economic Hourly Block Bid, or an Economic Hourly Block Bid with Intra-Hour Option, and may instead choose to participate in the RTM through Economic Bids or Self-Schedules.
- (z) For a Wheeling Through Self Schedule to be eligible as a Priority Wheeling Through for a given month, the Scheduling Coordinator must notify the CAISO of the MW quantity of

the power supply contract MW supporting the export Self-Schedule of the Priority Wheeling Through transaction and confirm it meets the eligibility requirements to support a Priority Wheeling Through. The Scheduling Coordinator must provide such information to the CAISO (1) by June 29, 2021 for the months of July and August 2021, and (2) by 45 days prior to the applicable month for all months thereafter.

* * * * *

Appendix A

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- Priority Wheeling Through

A Self-Schedule that is part of a Wheeling Through transaction consistent with Section 30.5.4 that is supported by (1) a firm power supply contract to serve an external Load Serving Entity's load throughout the calendar month and (2) monthly firm transmission the external Load Serving Entity has procured under applicable open access tariffs, or comparable transmission tariffs, for Hours Ending 07:00 through 22:00, Monday through Saturday excluding NERC holidays, from the source to a CAISO Scheduling Point.

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Attachment B – Marked Tariff (June 28, 2021)
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021

30.5.1 General Bidding Rules

- (a) All Energy and Ancillary Services Bids of each Scheduling Coordinator submitted to the DAM for the following Trading Day shall be submitted at or prior to 10:00 a.m. on the day preceding the Trading Day, but no sooner than seven (7) days prior to the Trading Day. All Energy and Ancillary Services Bids of each Scheduling Coordinator submitted to the RTM for the following Trading Day shall be submitted starting from the time of publication, at 1:00 p.m. on the day preceding the Trading Day, of DAM results for the Trading Day, and ending seventy-five (75) minutes prior to each applicable Trading Hour in the RTM. Scheduling Coordinators may submit only one set of Bids to the RTM for a given Trading Hour, which the CAISO uses for all Real-Time Market processes. The CAISO will not accept any Energy or Ancillary Services Bids for the following Trading Day between 10:00 a.m. on the day preceding the Trading Day and the publication, at 1:00 p.m. on the day preceding the Trading Day, of DAM results for the Trading Day;

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- (x) Scheduling Coordinators can submit Economic Hourly Block Bids with Intra-Hour Option. If accepted in the HASP, such a Bid creates a binding schedule with same MWh awards for each of the four (4) FMM intervals. After that, the RTM can optimize such schedules for economic reasons once through an FMM during the Trading Hour. As specified in Section 11, a cleared Economic Hourly Block Bid with Intra-Hour Option is not eligible for Bid Cost Recovery.
- (y) A Scheduling Coordinator submitting Bids to the RTM is not required to submit a Self-Schedule Hourly Block, a Variable Energy Resource Self-Schedule, an Economic Hourly Block Bid, or an Economic Hourly Block Bid with Intra-Hour Option, and may instead choose to participate in the RTM through Economic Bids or Self-Schedules.
- (z) For a Wheeling Through Self Schedule to be eligible as a Priority Wheeling Through for a given month, the Scheduling Coordinator must notify the CAISO of the MW quantity of

the power supply contract MW supporting the export Self-Schedule of the Priority Wheeling Through transaction and confirm it meets the eligibility requirements to support a Priority Wheeling Through. The Scheduling Coordinator must provide such information to the CAISO (1) by June 29, 2021 for the months of July and August 2021, and (2) by 45 days prior to the applicable month for all months thereafter.

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Appendix A

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- Priority Wheeling Through

A Self-Schedule that is part of a Wheeling Through transaction consistent with Section 30.5.4 that is supported by (1) a firm power supply contract to serve an external Load Serving Entity's load throughout the calendar month and (2) monthly firm transmission the external Load Serving Entity has procured under applicable open access tariffs, or comparable transmission tariffs, for Hours Ending 07:00 through 22:00, Monday through Saturday excluding NERC holidays, from the source to a CAISO Scheduling Point.

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Attachment C – Clean Tariff (July 2021)
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021

Section 9

9.3.1 CAISO Outage Coordination Functions

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9.3.1.3 Coordinating Outages of RA Resources

9.3.1.3.1 Maintenance Outages Requested Before Cure Period

Other than Outage types identified in Section 9.3.1.3.3, the CAISO denies Maintenance Outage requests or Approved Maintenance Outages on RA Resources requested before the 30-day Supply Plan revision deadline in Section 40.4.7.1(c) for the RA month in which the outage would first take place if the Scheduling Coordinator for the RA Resource does not provide RA Substitute Capacity to cover the extent of the Outage impacting RA Capacity that occurs during the period for which the resource has been shown on a monthly Supply Plan. The Scheduling Coordinator for the resource will notify the CAISO whether and to what extent the Outage affects RA Capacity and any contracted non-RA Capacity (both capacity sold to CAISO Load Serving Entities that is not RA Capacity for the month and capacity sold to external Load Serving Entities for export). The Scheduling Coordinator will promptly notify the CAISO of any changes to this information. The CAISO will incorporate this information into determining RA Substitute Capacity requirements. The RA Substitute Capacity must be provided by the monthly RA Substitute Capacity deadline established in the Business Practice Manual, which cannot be more than 72 hours after the 30-day Supply Plan revision deadline in Section 40.4.7.1(c) for the RA month in which the outage would first take place.

Once the CAISO grants final approval for a Maintenance Outage and the Outage has commenced, the CAISO does not subsequently deny the Outage for failure to provide RA Substitute Capacity by monthly RA Substitute Capacity deadlines that occur after the Outage has begun. Any such period of the Maintenance Outage for which the Scheduling Coordinator does not provide RA Substitute Capacity will be treated as a Forced Outage for purposes of assessing RAIM under Section 40.9 but the resource may not provide RA Substitute Capacity per Section 40.9.3.6.2.

9.3.1.3.2 Maintenance Outages Requested After Cure Period

Other than Outage types identified in Section 9.3.1.3.3, the CAISO denies Maintenance Outage requests on RA Resources submitted after the 30-day Supply Plan revision deadline in Section 40.4.7.1(c) for the RA month in which the outage would first take place if the Scheduling Coordinator for the RA Resource does not provide RA Substitute Capacity to cover the extent of the requested Maintenance Outage impacting RA Capacity that occurs during the period for which the resource has been shown on a monthly Supply Plan. The Scheduling Coordinator for the resource will promptly notify the CAISO whether and to what extent the Outage affects RA Capacity and any contracted non-RA Capacity (both capacity sold to CAISO Load Serving Entities that is not RA Capacity for the month and capacity sold to external Load Serving Entities for export). The Scheduling Coordinator will notify the CAISO of any changes to this information. The CAISO will incorporate this information into determining RA Substitute Capacity requirements. The RA Substitute Capacity must be provided by the post-monthly RA Substitute Capacity deadline established in the Business Practice Manual, which cannot be no more than 72 hours after the Outage request.

Once the CAISO grants final approval for a Maintenance Outage and the Outage has commenced, the CAISO does not subsequently deny the Outage for failure to provide RA Substitute Capacity by monthly RA Substitute Capacity deadlines that occur after the Outage has begun. Any such period of the Maintenance Outage for which the Scheduling Coordinator does not provide RA Substitute Capacity will be treated as a Forced Outage for purposes of assessing RAAIM under Section 40.9 but the resource may not provide RA Substitute Capacity per Section 40.9.3.6.2.

9.3.1.3.3 Exceptions to Requirement to Provide RA Substitute Capacity

The CAISO does not automatically deny an Outage pursuant to Section 9.3.1.3.1 or Section 9.3.1.3.2 if the Maintenance Outage is: (a) an Off-Peak Opportunity RA Maintenance Outage approved Pursuant to Section 9.3.1.3.6; (b) caused by an Outage on transmission facilities in the CAISO Controlled Grid; or (c) on RA Capacity that is solely Flexible RA Capacity.

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9.3.10 Forced Outages

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9.3.10.3.1 The following requirements apply if prior notice of a Forced Outage cannot be given to the CAISO:

- (a) The Operator of a Generating Unit or a Resource-Specific System Resource is required to notify the CAISO within sixty (60) minutes after discovering any change in the maximum output capability of at least ten (10) MW or five percent (5%) of the value registered in the Master File, whichever is greater, from the value registered in the CAISO's outage management system pursuant to Section 9 that lasts for fifteen (15) minutes or longer.
- (b) Notwithstanding Section 9.3.10.3.1(a), and unless otherwise exempted pursuant to the terms of a Business Practice Manual, the Operator of an Eligible Intermittent Resource with a PMax of greater than ten (10) MW for its entire generating facility is required to notify the CAISO within sixty (60) minutes after discovering any change in the maximum output capability of the generating facility of at least one (1) MW from the value registered in the CAISO's outage management system pursuant to Section 9 that lasts for fifteen (15) minutes or longer.

9.3.10.3.2 When a Scheduling Coordinator notifies the CAISO of a Forced Outage that constitutes only a partial derate of the resource, it shall indicate the amount of the derate and how the derate should be allocated among RA Capacity and contracted non-RA capacity (both capacity sold to CAISO Load Serving Entities that is not RA Capacity for the month and capacity sold to external Load Serving Entities for export).

9.3.10.4 The CAISO Control Center shall coordinate any operational changes necessary to accommodate a Forced Outage and Market Participants shall comply with the CAISO's instructions given for that purpose.

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Section 30

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30.5.1 General Bidding Rules

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- (x) Scheduling Coordinators can submit Economic Hourly Block Bids with Intra-Hour Option. If accepted in the HASP, such a Bid creates a binding schedule with same MWh awards for each of the four (4) FMM intervals. After that, the RTM can optimize such schedules for economic reasons once through an FMM during the Trading Hour. As specified in Section 11, a cleared Economic Hourly Block Bid with Intra-Hour Option is not eligible for Bid Cost Recovery.
- (y) A Scheduling Coordinator submitting Bids to the RTM is not required to submit a Self-Schedule Hourly Block, a Variable Energy Resource Self-Schedule, an Economic Hourly Block Bid, or an Economic Hourly Block Bid with Intra-Hour Option, and may instead choose to participate in the RTM through Economic Bids or Self-Schedules.
- (z) For a Wheeling Through Self Schedule to be eligible as a Priority Wheeling Through for a given month, the Scheduling Coordinator must notify the CAISO of the MW quantity of the power supply contract MW supporting the export Self-Schedule of the Priority Wheeling Through transaction and confirm it meets the eligibility requirements to support a Priority Wheeling Through. The Scheduling Coordinator must provide such information to the CAISO (1) by June 29, 2021 for the months of July and August 2021, and (2) by 45 days prior to the applicable month for all months thereafter.
- (aa) A Scheduling Coordinator for a CAISO Balancing Authority Area resource will indicate

through a resource parameter as prescribed in the Business Practice Manual that it has sold capacity to an out-of-balancing authority area Load Serving Entity, and no CAISO Load Serving Entity has a right to such capacity. If the Scheduling Coordinator does not indicate this status, the resource cannot be a designated resource for an export Self-Schedule at Scheduling Points backed by non-Resource Adequacy Capacity. The CAISO will notify a Scheduling Coordinator hourly, to the extent practicable, that its resource, which is flagged to support an export, is designated by another entity to support export Self-Schedules at Scheduling Points backed by non-Resource Adequacy Capacity. Upon receiving the notice, the Scheduling Coordinator for the designated resource shall notify the CAISO if it does not have a contractual commitment to support such export Self-Schedule or does not have a reasonable expectation to be available to support the export Self Schedule. The Scheduling Coordinator for the designated resource and the Scheduling Coordinator for the export Self-Schedule shall designate a resource to support such export only if the resource is expected to have sufficient available capacity to support the export quantity throughout the entire hour. For Variable Energy Resources, this requirement can only be satisfied if the resource's forecasted output for each of the applicable four (4) fifteen (15) minute intervals at the time of bid submission is for Generation that is equal to or greater than the Self Schedule export quantity. The designated capacity must be the deliverable capacity of a resource with Full Capacity Deliverability Status, Partial Capacity Deliverability Status, or Interim Deliverability Status that is shown on the CAISO's NQC list.

- (bb) In addition to meeting any obligations applicable to Resource Adequacy Resources, a Scheduling Coordinator for a resource supporting Self-Schedules of exports at Scheduling Points backed by non-Resource Adequacy Capacity shall submit a \$0/MW RUC Availability Bid for a quantity equal to or greater than the quantity of the export.
- (cc) The Scheduling Coordinator for the resource shall offer Energy Bids into the Real-Time Market to support Self-Schedules of exports at Scheduling Points backed by non-Resource Adequacy Capacity.

- (dd) The positive difference in quantity between a designated resource's RUC Schedule and the RUC Schedule of the corresponding Self-Schedule at a Scheduling Point backed by non-Resource Adequacy Capacity cannot back additional exports at a Scheduling Point backed by non-Resource Adequacy Capacity scheduled in the Real-Time Market.
- (ee) A Scheduling Coordinator shall not schedule an import Self-Schedule to support an export Self-Schedule for a Priority Wheeling Through. The transaction is properly scheduled as a Wheeling Through transaction as described in section 30.5.4.

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Section 31

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31.4 CAISO Market Adjustments To Non-Priced Quantities In The IFM

All Self-Schedules are respected by SCUC to the maximum extent possible and are protected from curtailment in the Congestion Management process to the extent that there are Effective Economic Bids that can relieve Congestion. If all Effective Economic Bids in the IFM are exhausted, resource Self-Schedules between the resource's Minimum Load as defined in the Master File, or if applicable, as modified pursuant to Section 9.3.3, and the first Energy level of the first Energy Bid point will be subject to adjustments by the CAISO Market optimization based on the scheduling priorities listed below. This functionality of the optimization software is implemented through the setting of scheduling parameters as described in Section 27.4.3 and specified in Section 27.4.3.1 and the Business Practice Manuals.

Through this process, imports and exports may be reduced to zero, Demand Bids may be reduced to zero, Price Taker Demand (LAP load) may be reduced, and Generation may be reduced to a lower operating limit (or Regulation Limit) (or to a lower Regulation Limit plus any qualified Regulation Down award or Self-Provided Ancillary Services, if applicable). Any Self-Schedules below the Minimum Load level are treated as fixed Self-Schedules and are not subject to these adjustments for Congestion

Management. The provisions of this section shall apply only to the extent they do not conflict with any MSS Agreement. In accordance with Section 27.4.3.5, the resources submitted in valid TOR, ETC or Converted Rights Self-Schedules shall not be adjusted in the IFM in response to an insufficiency of Effective Economic Bids. Thus the adjustment sequence for the IFM from highest priority (last to be adjusted) to lowest priority (first to be adjusted), is as follows:

- (a) Reliability Must Run (RMR) Generation pre-dispatch reduction;
- (b) Day-Ahead TOR Self-Schedules reduction (balanced demand and supply reduction);
- (c) Day-Ahead ETC and Converted Rights Self-Schedules reduction; different ETC priority levels will be observed based upon global ETC priorities provided to the CAISO by the Responsible PTOs;
- (d) Internal Transmission Constraint relaxation for the IFM pursuant to Section 27.4.3.1;
- (e) The export Self-Schedule of a Priority Wheeling Through; Self-Schedules of CAISO Demand reduction subject to Section 31.3.1.3; exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports; and Self-Schedules of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity;
- (f) Self-Schedules of exports at Scheduling Points not explicitly sourced by non-Resource Adequacy Capacity, except those exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports as set forth in Section 31.4(d), and the export Self-Schedule of a non-Priority Wheeling Through;
- (g) Day-Ahead Regulatory Must-Run Generation and Regulatory Must-Take Generation reduction;
- (h) Other Self-Schedules of Supply reduction, and the import Self-Schedule of a

Priority Wheeling Through; and

- (i) The import Self-Schedule of a non-Priority Wheeling Through.

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31.5.5 Selection and Commitment of RUC Capacity

Capacity that is not already scheduled in the IFM may be selected as RUC Capacity through the RUC process of the DAM. The RUC optimization will select RUC Capacity and produce nodal RUC Prices by minimizing total Bid cost based on RUC Availability Bids and Start-Up, Minimum Load Bids and Transition Costs. If RUC cannot schedule sufficient capacity to meet the RUC Procurement Target, a RUC Award or RUC Schedule will be issued to imports providing RA Capacity for the full amount of their RA Capacity. RUC will not consider Start-Up, Minimum Load Bids, or Transition Costs for resources already committed in the IFM. The RUC Capacity of a resource is the incremental amount of capacity selected in RUC above the resource's Day-Ahead Schedule. The resource's Day-Ahead Schedule plus its RUC Capacity comprise the resource's RUC Schedule. The CAISO will only issue RUC Start-Up Instructions to resources committed in RUC that must receive a Start-Up Instruction in the Day-Ahead in order to be available to meet Real-Time Demand. RUC Schedules will be provided to Scheduling Coordinators even if a RUC Start-Up Instruction is not issued at that time. RUC shall not Shut Down resources scheduled through the IFM and RUC will not commit a Multi-Stage Generating Resource to a lower MSG Configuration that is unable to support the Energy scheduled in the IFM. If the RUC process cannot find a feasible solution given the resources committed in the IFM, the RUC process will adjust constraints as described in Section 31.5.4 to arrive at a feasible solution that accommodates all the resources committed in the IFM, and any necessary de-commitment of IFM committed units shall be effectuated through an Exceptional Dispatch.

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Section 34

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34.12.1 Increasing Supply

The scheduling priorities as defined in the RTM optimization to meet the need for increasing Supply as reflected from higher to lower priority are as follows:

- (a) CAISO Forecast of CAISO Demand; the export Self-Schedule of a Priority Wheeling Through; exports explicitly identified in a Resource Adequacy Plan backed by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports; or Self-Schedules for exports at Scheduling Points in the RTM backed by Generation from non-Resource Adequacy Capacity or from non-RUC Capacity;
- (b) RUC Schedules that are Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity, or the RUC Schedules that are the export Self-Schedules of non-Priority Wheeling Throughs;
- (c) Real-Time Market Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity or non-RUC capacity, or the Real-Time Market Self-Schedules that are the export Self-Schedules of a non-Priority Wheeling Through; and
- (d) Contingency Only Operating Reserve if activated by Operator to provide Energy (as indicated by the Contingency Flag and the Contingency condition).

34.12.2 Decreasing Supply

The scheduling priorities as defined in the RTM optimization to meet the need for decreasing Supply as reflected from higher to lower priority are as follows:

- (a) Non-Participating Load increase;
- (b) Reliability Must Run (RMR) Schedule (Day-Ahead manual pre-dispatch or Manual RMR

Dispatches or Dispatches that are flagged as RMR Dispatches following the MPM, for Legacy RMR Units and Exceptional Dispatch for RMR Resources process);

- (c) Transmission Ownership Right (TOR) Self-Schedule;
- (d) Existing Rights (ETC) Self-Schedule;
- (e) Regulatory Must-Run and Regulatory Must-Take (RMT) Self-Schedule;
- (f) Participating Load increase;
- (g) Day-Ahead Supply Schedule;
- (h) Self-Schedule Hourly Block; and
- (i) Import Self-Schedule of a non-Priority Wheeling Through.

These dispatch priorities as defined in the RTM optimization may be superseded by operator actions and procedures as necessary to ensure reliable operations.

34.12.3 In the event an Intertie is constrained in the import direction by a scheduling limit or Path 26 is constrained in the north-south direction, when HASP cannot meet CAISO Forecast of CAISO Demand or fully accommodate a Priority Wheeling Through transaction, the CAISO will perform a post-HASP process to pro rata allocate available transmission capacity between CAISO Load and Priority Wheel Through transactions, as described in the Business Practice Manual. The CAISO Load pro rata share will be based on the lower of each applicable Resource Adequacy Resource's Real-Time Energy Bid quantity or its shown Resource Adequacy Capacity. The Priority Wheeling Through pro rata share for each Self-Schedule will be based on the lowest of (1) 110 percent of the submitted Day-Ahead Market Self-Schedule of the Priority Wheeling Through transaction, (2) the submitted Real-Time Market Self-Schedule of the Priority Wheeling Through transaction, or (3) the Priority Wheeling Through quantity requested 45-days in advance of the month. The available transmission capacity the CAISO awards to Priority Wheeling Through transactions in the post-HASP process cannot exceed the Priority Wheeling Through quantity the CAISO calculates in this pro rata allocation. Energy scheduled via the post-HASP process will be settled as Exceptional Dispatch Energy pursuant to Section 11.5.6.1, as applicable.

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Section 40

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40.6.6 Requirement for Partial Resource Adequacy Resources

Only that output of a Resource Adequacy Resource that is designated by a Scheduling Coordinator as Resource Adequacy Capacity in its monthly or annual Supply Plan shall have an availability obligation to the CAISO. Exports being supported by non-Resource Adequacy Capacity from a Resource Adequacy Resource that becomes unavailable or unusable shall be considered as an export of non-Resource Adequacy Capacity. If a Resource Adequacy Resource goes on a Forced Outage, until the Scheduling Coordinator provides the information requested under section 9.3.10.3.2, the CAISO shall determine if the Scheduling Coordinator indicated under section 30.5.1 (aa) that capacity from its Resource Adequacy Resource is backing a Self-Schedule of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity. If the Scheduling Coordinator has indicated capacity from its Resource Adequacy Resource is backing a Self-Schedule of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity, the CAISO will allocate the derate pro rata between the RA Capacity and the remainder of the resource's capacity up to its PMax.

Attachment D – Marked Tariff (July 2021)
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021

Section 9

9.3.1 CAISO Outage Coordination Functions

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9.3.1.3 Coordinating Outages of RA Resources

9.3.1.3.1 Maintenance Outages Requested Before Cure Period

Other than Outage types identified in Section 9.3.1.3.3, the CAISO denies Maintenance Outage requests or Approved Maintenance Outages on RA Resources requested before the 30-day Supply Plan revision deadline in Section 40.4.7.1(c) for the RA month in which the outage would first take place if the Scheduling Coordinator for the RA Resource does not provide RA Substitute Capacity to cover the extent of the Outage impacting RA Capacity that occurs during the period for which the resource has been shown on a monthly Supply Plan. The Scheduling Coordinator for the resource will notify the CAISO whether and to what extent the Outage affects RA Capacity and any contracted non-RA Capacity (both capacity sold to CAISO Load Serving Entities that is not RA Capacity for the month and capacity sold to external Load Serving Entities for export). The Scheduling Coordinator will promptly notify the CAISO of any changes to this information. The CAISO will incorporate this information into determining RA Substitute Capacity requirements. The RA Substitute Capacity must be provided by the monthly RA Substitute Capacity deadline established in the Business Practice Manual, which cannot be more than 72 hours after the 30-day Supply Plan revision deadline in Section 40.4.7.1(c) for the RA month in which the outage would first take place.

Once the CAISO grants final approval for a Maintenance Outage and the Outage has commenced, the CAISO does not subsequently deny the Outage for failure to provide RA Substitute Capacity by monthly RA Substitute Capacity deadlines that occur after the Outage has begun. Any such period of the Maintenance Outage for which the Scheduling Coordinator does not provide RA Substitute Capacity will be treated as a Forced Outage for purposes of assessing RAIM under Section 40.9 but the resource may not provide RA Substitute Capacity per Section 40.9.3.6.2.

9.3.1.3.2 Maintenance Outages Requested After Cure Period

Other than Outage types identified in Section 9.3.1.3.3, the CAISO denies Maintenance Outage requests on RA Resources submitted after the 30-day Supply Plan revision deadline in Section 40.4.7.1(c) for the RA month in which the outage would first take place if the Scheduling Coordinator for the RA Resource does not provide RA Substitute Capacity to cover the extent of the requested Maintenance Outage impacting RA Capacity that occurs during the period for which the resource has been shown on a monthly Supply Plan. The Scheduling Coordinator for the resource will promptly notify the CAISO whether and to what extent the Outage affects RA Capacity and any contracted non-RA Capacity (both capacity sold to CAISO Load Serving Entities that is not RA Capacity for the month and capacity sold to external Load Serving Entities for export). The Scheduling Coordinator will notify the CAISO of any changes to this information. The CAISO will incorporate this information into determining RA Substitute Capacity requirements. The RA Substitute Capacity must be provided by the post-monthly RA Substitute Capacity deadline established in the Business Practice Manual, which cannot be no more than 72 hours after the Outage request.

Once the CAISO grants final approval for a Maintenance Outage and the Outage has commenced, the CAISO does not subsequently deny the Outage for failure to provide RA Substitute Capacity by monthly RA Substitute Capacity deadlines that occur after the Outage has begun. Any such period of the Maintenance Outage for which the Scheduling Coordinator does not provide RA Substitute Capacity will be treated as a Forced Outage for purposes of assessing RAIM under Section 40.9 but the resource may not provide RA Substitute Capacity per Section 40.9.3.6.2.

9.3.1.3.3 Exceptions to Requirement to Provide RA Substitute Capacity

The CAISO does not automatically deny an Outage pursuant to Section 9.3.1.3.1 or Section 9.3.1.3.2 if the Maintenance Outage is: (a) an Off-Peak Opportunity RA Maintenance Outage approved Pursuant to Section 9.3.1.3.6; (b) caused by an Outage on transmission facilities in the CAISO Controlled Grid; or (c) on RA Capacity that is solely Flexible RA Capacity.

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9.3.10 Forced Outages

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9.3.10.3.1 The following requirements apply if prior notice of a Forced Outage cannot be given to the CAISO:

- (a) The Operator of a Generating Unit or a Resource-Specific System Resource is required to notify the CAISO within sixty (60) minutes after discovering any change in the maximum output capability of at least ten (10) MW or five percent (5%) of the value registered in the Master File, whichever is greater, from the value registered in the CAISO's outage management system pursuant to Section 9 that lasts for fifteen (15) minutes or longer.
- (b) Notwithstanding Section 9.3.10.3.1(a), and unless otherwise exempted pursuant to the terms of a Business Practice Manual, the Operator of an Eligible Intermittent Resource with a PMax of greater than ten (10) MW for its entire generating facility is required to notify the CAISO within sixty (60) minutes after discovering any change in the maximum output capability of the generating facility of at least one (1) MW from the value registered in the CAISO's outage management system pursuant to Section 9 that lasts for fifteen (15) minutes or longer.

9.3.10.3.2 When a Scheduling Coordinator notifies the CAISO of a Forced Outage that constitutes only a partial derate of the resource, it shall indicate the amount of the derate and how the derate should be allocated among RA Capacity and contracted non-RA capacity (both capacity sold to CAISO Load Serving Entities that is not RA Capacity for the month and capacity sold to external Load Serving Entities for export).

9.3.10.4 The CAISO Control Center shall coordinate any operational changes necessary to accommodate a Forced Outage and Market Participants shall comply with the CAISO's instructions given for that purpose.

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Section 30

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30.5.1 General Bidding Rules

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- (x) Scheduling Coordinators can submit Economic Hourly Block Bids with Intra-Hour Option. If accepted in the HASP, such a Bid creates a binding schedule with same MWh awards for each of the four (4) FMM intervals. After that, the RTM can optimize such schedules for economic reasons once through an FMM during the Trading Hour. As specified in Section 11, a cleared Economic Hourly Block Bid with Intra-Hour Option is not eligible for Bid Cost Recovery.
- (y) A Scheduling Coordinator submitting Bids to the RTM is not required to submit a Self-Schedule Hourly Block, a Variable Energy Resource Self-Schedule, an Economic Hourly Block Bid, or an Economic Hourly Block Bid with Intra-Hour Option, and may instead choose to participate in the RTM through Economic Bids or Self-Schedules.
- (z) For a Wheeling Through Self Schedule to be eligible as a Priority Wheeling Through for a given month, the Scheduling Coordinator must notify the CAISO of the MW quantity of the power supply contract MW supporting the export Self-Schedule of the Priority Wheeling Through transaction and confirm it meets the eligibility requirements to support a Priority Wheeling Through. The Scheduling Coordinator must provide such information to the CAISO (1) by June 29, 2021 for the months of July and August 2021, and (2) by 45 days prior to the applicable month for all months thereafter.

(aa) A Scheduling Coordinator for a CAISO Balancing Authority Area resource will indicate

through a resource parameter as prescribed in the Business Practice Manual that it has sold capacity to an out-of-balancing authority area Load Serving Entity, and no CAISO Load Serving Entity has a right to such capacity. If the Scheduling Coordinator does not indicate this status, the resource cannot be a designated resource for an export Self-Schedule at Scheduling Points backed by non-Resource Adequacy Capacity. The CAISO will notify a Scheduling Coordinator hourly, to the extent practicable, that its resource, which is flagged to support an export, is designated by another entity to support export Self-Schedules at Scheduling Points backed by non-Resource Adequacy Capacity. Upon receiving the notice, the Scheduling Coordinator for the designated resource shall notify the CAISO if it does not have a contractual commitment to support such export Self-Schedule or does not have a reasonable expectation to be available to support the export Self Schedule. The Scheduling Coordinator for the designated resource and the Scheduling Coordinator for the export Self-Schedule shall designate a resource to support such export only if the resource is expected to have sufficient available capacity to support the export quantity throughout the entire hour. For Variable Energy Resources, this requirement can only be satisfied if the resource's forecasted output for each of the applicable four (4) fifteen (15) minute intervals at the time of bid submission is for Generation that is equal to or greater than the Self Schedule export quantity. The designated capacity must be the deliverable capacity of a resource with Full Capacity Deliverability Status, Partial Capacity Deliverability Status, or Interim Deliverability Status that is shown on the CAISO's NQC list.

- (bb) In addition to meeting any obligations applicable to Resource Adequacy Resources, a Scheduling Coordinator for a resource supporting Self-Schedules of exports at Scheduling Points backed by non-Resource Adequacy Capacity shall submit a \$0/MW RUC Availability Bid for a quantity equal to or greater than the quantity of the export.
- (cc) The Scheduling Coordinator for the resource shall offer Energy Bids into the Real-Time Market to support Self-Schedules of exports at Scheduling Points backed by non-Resource Adequacy Capacity.

- (dd) The positive difference in quantity between a designated resource's RUC Schedule and the RUC Schedule of the corresponding Self-Schedule at a Scheduling Point backed by non-Resource Adequacy Capacity cannot back additional exports at a Scheduling Point backed by non-Resource Adequacy Capacity scheduled in the Real-Time Market.
- (ee) A Scheduling Coordinator shall not schedule an import Self-Schedule to support an export Self-Schedule for a Priority Wheeling Through. The transaction is properly scheduled as a Wheeling Through transaction as described in section 30.5.4.

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Section 31

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31.4 CAISO Market Adjustments To Non-Priced Quantities In The IFM

All Self-Schedules are respected by SCUC to the maximum extent possible and are protected from curtailment in the Congestion Management process to the extent that there are Effective Economic Bids that can relieve Congestion. If all Effective Economic Bids in the IFM are exhausted, resource Self-Schedules between the resource's Minimum Load as defined in the Master File, or if applicable, as modified pursuant to Section 9.3.3, and the first Energy level of the first Energy Bid point will be subject to adjustments by the CAISO Market optimization based on the scheduling priorities listed below. This functionality of the optimization software is implemented through the setting of scheduling parameters as described in Section 27.4.3 and specified in Section 27.4.3.1 and the Business Practice Manuals.

Through this process, imports and exports may be reduced to zero, Demand Bids may be reduced to zero, Price Taker Demand (LAP load) may be reduced, and Generation may be reduced to a lower operating limit (or Regulation Limit) (or to a lower Regulation Limit plus any qualified Regulation Down award or Self-Provided Ancillary Services, if applicable). Any Self-Schedules below the Minimum Load level are treated as fixed Self-Schedules and are not subject to these adjustments for Congestion

Management. The provisions of this section shall apply only to the extent they do not conflict with any MSS Agreement. In accordance with Section 27.4.3.5, the resources submitted in valid TOR, ETC or Converted Rights Self-Schedules shall not be adjusted in the IFM in response to an insufficiency of Effective Economic Bids. Thus the adjustment sequence for the IFM from highest priority (last to be adjusted) to lowest priority (first to be adjusted), is as follows:

- (a) Reliability Must Run (RMR) Generation pre-dispatch reduction;
- (b) Day-Ahead TOR Self-Schedules reduction (balanced demand and supply reduction);
- (c) Day-Ahead ETC and Converted Rights Self-Schedules reduction; different ETC priority levels will be observed based upon global ETC priorities provided to the CAISO by the Responsible PTOs;
- (d) Internal Transmission Constraint relaxation for the IFM pursuant to Section 27.4.3.1;
- (e) The export Self-Schedule of a Priority Wheeling Through; ~~Other~~ Self-Schedules of CAISO Demand reduction subject to Section 31.3.1.3; exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports; and Self-Schedules of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity;
- (f) Self-Schedules of exports at Scheduling Points not explicitly sourced by non-Resource Adequacy Capacity, except those exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports as set forth in Section 31.4(d), and the export Self-Schedule of a non-Priority Wheeling Through;
- (g) Day-Ahead Regulatory Must-Run Generation and Regulatory Must-Take Generation reduction;
- (h) Other Self-Schedules of Supply reduction, and the import Self-Schedule of a

Priority Wheeling Through; and

(i) The import Self-Schedule of a non-Priority Wheeling Through.

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31.5.5 Selection and Commitment of RUC Capacity

Capacity that is not already scheduled in the IFM may be selected as RUC Capacity through the RUC process of the DAM. The RUC optimization will select RUC Capacity and produce nodal RUC Prices by minimizing total Bid cost based on RUC Availability Bids and Start-Up, Minimum Load Bids and Transition Costs. If RUC cannot schedule sufficient capacity to meet the RUC Procurement Target, a RUC Award or RUC Schedule will be issued to imports providing RA Capacity for the full amount of their RA Capacity. RUC will not consider Start-Up, Minimum Load Bids, or Transition Costs for resources already committed in the IFM. The RUC Capacity of a resource is the incremental amount of capacity selected in RUC above the resource's Day-Ahead Schedule. The resource's Day-Ahead Schedule plus its RUC Capacity comprise the resource's RUC Schedule. The CAISO will only issue RUC Start-Up Instructions to resources committed in RUC that must receive a Start-Up Instruction in the Day-Ahead in order to be available to meet Real-Time Demand. RUC Schedules will be provided to Scheduling Coordinators even if a RUC Start-Up Instruction is not issued at that time. RUC shall not Shut Down resources scheduled through the IFM and RUC will not commit a Multi-Stage Generating Resource to a lower MSG Configuration that is unable to support the Energy scheduled in the IFM. If the RUC process cannot find a feasible solution given the resources committed in the IFM, the RUC process will adjust constraints as described in Section 31.5.4 to arrive at a feasible solution that accommodates all the resources committed in the IFM, and any necessary de-commitment of IFM committed units shall be effectuated through an Exceptional Dispatch.

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Section 34

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34.12.1 Increasing Supply

The scheduling priorities as defined in the RTM optimization to meet the need for increasing Supply as reflected from higher to lower priority are as follows:

- (a) CAISO Forecast of CAISO Demand; the export Self-Schedule of a Priority Wheeling Through; ~~Non-Participating Load reduction,~~ exports explicitly identified in a Resource Adequacy Plan ~~backed to be served~~ by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports; or Self-Schedules for exports at Scheduling Points in the RTM ~~backed served~~ by Generation from non-Resource Adequacy Capacity or from non-RUC Capacity;
- (b) RUC Schedules that are Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity, or the RUC Schedules that are the export Self-Schedules of non-Priority Wheeling Throughs; Self Schedules for exports at Scheduling Points in the RTM not offered by Generation from non-Resource Adequacy Capacity or not offered by Generation from non-RUC Capacity, except those exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports as set forth in Section 34.12.1(a); and
- (c) Real-Time Market Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity or non-RUC capacity, or the Real-Time Market Self-Schedules that are the export Self-Schedules of a non-Priority Wheeling Through; and
- (d) Contingency Only Operating Reserve if activated by Operator to provide Energy (as indicated by the Contingency Flag and the Contingency condition).

34.12.2 Decreasing Supply

The scheduling priorities as defined in the RTM optimization to meet the need for decreasing Supply as reflected from higher to lower priority are as follows:

- (a) Non-Participating Load increase;
- (b) Reliability Must Run (RMR) Schedule (Day-Ahead manual pre-dispatch or Manual RMR Dispatches or Dispatches that are flagged as RMR Dispatches following the MPM, for Legacy RMR Units and Exceptional Dispatch for RMR Resources process);
- (c) Transmission Ownership Right (TOR) Self-Schedule;
- (d) Existing Rights (ETC) Self-Schedule;
- (e) Regulatory Must-Run and Regulatory Must-Take (RMT) Self-Schedule;
- (f) Participating Load increase;
- (g) Day-Ahead Supply Schedule; ~~and~~
- (h) Self-Schedule Hourly Block; and
- (i) Import Self-Schedule of a non-Priority Wheeling Through.

These dispatch priorities as defined in the RTM optimization may be superseded by operator actions and procedures as necessary to ensure reliable operations.

34.12.3 In the event an Intertie is constrained in the import direction by a scheduling limit or Path 26 is constrained in the north-south direction, when HASP cannot meet CAISO Forecast of CAISO Demand or fully accommodate a Priority Wheeling Through transaction, the CAISO will perform a post-HASP process to pro rata allocate available transmission capacity between CAISO Load and Priority Wheel Through transactions, as described in the Business Practice Manual. The CAISO Load pro rata share will be based on the lower of each applicable Resource Adequacy Resource's Real-Time Energy Bid quantity or its shown Resource Adequacy Capacity. The Priority Wheeling Through pro rata share for each Self-Schedule will be based on the lowest of (1) 110 percent of the submitted Day-Ahead Market Self-Schedule of the Priority Wheeling Through transaction, (2) the submitted Real-Time Market Self-Schedule of the Priority Wheeling Through transaction, or (3) the Priority Wheeling Through quantity requested 45-days in advance of the month. The available transmission capacity the CAISO awards to Priority Wheeling Through transactions in the post-HASP process cannot exceed the Priority Wheeling

Through quantity the CAISO calculates in this pro rata allocation. Energy scheduled via the post-HASP process will be settled as Exceptional Dispatch Energy pursuant to Section 11.5.6.1, as applicable.

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Section 40

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40.6.6 Requirement for Partial Resource Adequacy Resources

Only that output of a ~~Partial~~-Resource Adequacy Resource that is designated by a Scheduling Coordinator as Resource Adequacy Capacity in its monthly or annual Supply Plan shall have an availability obligation to the CAISO. Exports being supported by non-Resource Adequacy Capacity from a ~~Partial~~-Resource Adequacy Resource that becomes unavailable or unusable shall be considered as an export of non-Resource Adequacy Capacity. If a Resource Adequacy Resource goes on a Forced Outage, until the Scheduling Coordinator provides the information requested under section 9.3.10.3.2, the CAISO shall determine if the Scheduling Coordinator indicated under section 30.5.1 (aa) that capacity from its Resource Adequacy Resource is backing a Self-Schedule of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity. If the Scheduling Coordinator has indicated capacity from its Resource Adequacy Resource is backing a Self-Schedule of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity, the CAISO will allocate the derate pro rata between the RA Capacity and the remainder of the resource's capacity up to its PMax. based on the pro-rata allocation of derated capacity of the Partial Resource Adequacy Resource as follows:

(a) ~~Resource Adequacy Capacity~~ $[(\text{Resource Adequacy Capacity} / \text{PMax Capacity of Resource Adequacy Resource}) \times \text{MW Derate or Outage}]$; or

(b) ~~[1 - (Resource Adequacy Capacity / PMax Capacity of Resource Adequacy Resource)] x De-rated PMax~~].

Attachment E – Clean Tariff (June 1, 2022)
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021

Section 30

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30.5.1 General Bidding Rules

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- (y) A Scheduling Coordinator submitting Bids to the RTM is not required to submit a Self-Schedule Hourly Block, a Variable Energy Resource Self-Schedule, an Economic Hourly Block Bid, or an Economic Hourly Block Bid with Intra-Hour Option, and may instead choose to participate in the RTM through Economic Bids or Self-Schedules.
- (z) [Not Used]
- (aa) A Scheduling Coordinator for a CAISO Balancing Authority Area resource will indicate through a resource parameter as prescribed in the Business Practice Manual that it has sold capacity to an out-of-balancing authority area load serving entity, and no CAISO Load Serving Entity has a right to such capacity. If the Scheduling Coordinator does not indicate this status, the resource cannot be a designated resource for an export Self-Schedule at Scheduling Points backed by non-Resource Adequacy Capacity. The CAISO will notify a Scheduling Coordinator hourly, to the extent practicable, that its resource, which is flagged to support an export, is designated by another entity to support export Self-Schedules at Scheduling Points backed by non-Resource Adequacy Capacity. Upon receiving the notice, the Scheduling Coordinator for the designated resource shall notify the CAISO if it does not have a contractual commitment to support such export Self-Schedule or does not have a reasonable expectation to be available to support the export Self Schedule. The Scheduling Coordinator for the designated resource and the Scheduling Coordinator for the export Self-Schedule shall designate a resource to support such export only if the resource is expected to have sufficient available capacity to support the export quantity throughout the entire hour. For Variable Energy Resources, this requirement can only be satisfied if the resource's forecasted

output for each of the applicable four (4) fifteen (15) minute intervals at the time of bid submission is for Generation that is equal to or greater than the Self Schedule export quantity. The designated capacity must be the deliverable capacity of a resource with Full Capacity Deliverability Status, Partial Capacity Deliverability Status, or Interim Deliverability Status that is shown on the CAISO's NQC list.

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Section 31

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31.4 CAISO Market Adjustments To Non-Priced Quantities In The IFM

All Self-Schedules are respected by SCUC to the maximum extent possible and are protected from curtailment in the Congestion Management process to the extent that there are Effective Economic Bids that can relieve Congestion. If all Effective Economic Bids in the IFM are exhausted, resource Self-Schedules between the resource's Minimum Load as defined in the Master File, or if applicable, as modified pursuant to Section 9.3.3, and the first Energy level of the first Energy Bid point will be subject to adjustments by the CAISO Market optimization based on the scheduling priorities listed below. This functionality of the optimization software is implemented through the setting of scheduling parameters as described in Section 27.4.3 and specified in Section 27.4.3.1 and the Business Practice Manuals. Through this process, imports and exports may be reduced to zero, Demand Bids may be reduced to zero, Price Taker Demand (LAP load) may be reduced, and Generation may be reduced to a lower operating limit (or Regulation Limit) (or to a lower Regulation Limit plus any qualified Regulation Down award or Self-Provided Ancillary Services, if applicable). Any Self-Schedules below the Minimum Load level are treated as fixed Self-Schedules and are not subject to these adjustments for Congestion Management. The provisions of this section shall apply only to the extent they do not conflict with any MSS Agreement. In accordance with Section 27.4.3.5, the resources submitted in valid TOR, ETC or

Converted Rights Self-Schedules shall not be adjusted in the IFM in response to an insufficiency of Effective Economic Bids. Thus the adjustment sequence for the IFM from highest priority (last to be adjusted) to lowest priority (first to be adjusted), is as follows:

- (a) Reliability Must Run (RMR) Generation pre-dispatch reduction;
- (b) Day-Ahead TOR Self-Schedules reduction (balanced demand and supply reduction);
- (c) Day-Ahead ETC and Converted Rights Self-Schedules reduction; different ETC priority levels will be observed based upon global ETC priorities provided to the CAISO by the Responsible PTOs;
- (d) Internal Transmission Constraint relaxation for the IFM pursuant to Section 27.4.3.1;
- (e) Self-Schedules of CAISO Demand reduction subject to Section 31.3.1.3; exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports; and Self-Schedules of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity;
- (f) Self-Schedules of exports at Scheduling Points not explicitly sourced by non-Resource Adequacy Capacity, except those exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports as set forth in Section 31.4(d);
- (g) Day-Ahead Regulatory Must-Run Generation and Regulatory Must-Take Generation reduction;
- (h) Other Self-Schedules of Supply reduction.

* * * * *

31.5.5 Selection and Commitment of RUC Capacity

Capacity that is not already scheduled in the IFM may be selected as RUC Capacity through the RUC process of the DAM. The RUC optimization will select RUC Capacity and produce nodal RUC Prices by minimizing total Bid cost based on RUC Availability Bids and Start-Up, Minimum Load Bids and Transition Costs. RUC will not consider Start-Up, Minimum Load Bids, or Transition Costs for resources already committed in the IFM. The RUC Capacity of a resource is the incremental amount of capacity selected in RUC above the resource's Day-Ahead Schedule. The resource's Day-Ahead Schedule plus its RUC Capacity comprise the resource's RUC Schedule. The CAISO will only issue RUC Start-Up Instructions to resources committed in RUC that must receive a Start-Up Instruction in the Day-Ahead in order to be available to meet Real-Time Demand. RUC Schedules will be provided to Scheduling Coordinators even if a RUC Start-Up Instruction is not issued at that time. RUC shall not Shut Down resources scheduled through the IFM and RUC will not commit a Multi-Stage Generating Resource to a lower MSG Configuration that is unable to support the Energy scheduled in the IFM. If the RUC process cannot find a feasible solution given the resources committed in the IFM, the RUC process will adjust constraints as described in Section 31.5.4 to arrive at a feasible solution that accommodates all the resources committed in the IFM, and any necessary de-commitment of IFM committed units shall be effectuated through an Exceptional Dispatch.

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Section 34

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34.12.1 Increasing Supply

The scheduling priorities as defined in the RTM optimization to meet the need for increasing Supply as reflected from higher to lower priority are as follows:

- (a) CAISO Forecast of CAISO Demand; exports explicitly identified in a Resource

Adequacy Plan backed by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports; or Self-Schedules for exports at Scheduling Points backed by Generation from non-Resource Adequacy Capacity or from non-RUC Capacity;

- (b) Day-Ahead RUC schedules that are Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity;
- (c) Real-Time Market Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity; and
- (d) Contingency Only Operating Reserve if activated by Operator to provide Energy (as indicated by the Contingency Flag and the Contingency condition).

34.12.2 Decreasing Supply

The scheduling priorities as defined in the RTM optimization to meet the need for decreasing Supply as reflected from higher to lower priority are as follows:

- (a) Non-Participating Load increase;
- (b) Reliability Must Run (RMR) Schedule (Day-Ahead manual pre-dispatch or Manual RMR Dispatches or Dispatches that are flagged as RMR Dispatches following the MPM, for Legacy RMR Units and Exceptional Dispatch for RMR Resources process);
- (c) Transmission Ownership Right (TOR) Self-Schedule;
- (d) Existing Rights (ETC) Self-Schedule;
- (e) Regulatory Must-Run and Regulatory Must-Take (RMT) Self-Schedule;
- (f) Participating Load increase;
- (g) Day-Ahead Supply Schedule; and
- (h) Self-Schedule Hourly Block.

These dispatch priorities as defined in the RTM optimization may be superseded by operator actions and procedures as necessary to ensure reliable operations.

34.12.3 [Not Used]

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Appendix A

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- [Not Used]

Attachment F – Marked Tariff (June 1, 2022)
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021

Section 30

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30.5.1 **General Bidding Rules**

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- (y) A Scheduling Coordinator submitting Bids to the RTM is not required to submit a Self-Schedule Hourly Block, a Variable Energy Resource Self-Schedule, an Economic Hourly Block Bid, or an Economic Hourly Block Bid with Intra-Hour Option, and may instead choose to participate in the RTM through Economic Bids or Self-Schedules.
- (z) ~~[Not Used] For a Wheeling Through Self-Schedule to be eligible as a Priority Wheeling Through for a given month, the Scheduling Coordinator must notify the CAISO of the MW quantity of the power supply contract MW supporting the export Self-Schedule of the Priority Wheeling Through transaction and confirm it meets the eligibility requirements to support a Priority Wheeling Through. The Scheduling Coordinator must provide such information to the CAISO (1) by June 29, 2021 for the months of July and August 2021, and (2) by 45 days prior to the applicable month for all months thereafter.~~
- (aa) A Scheduling Coordinator for a CAISO Balancing Authority Area resource will indicate through a resource parameter as prescribed in the Business Practice Manual that it has sold capacity to an out-of-balancing authority area load serving entity, and no CAISO Load Serving Entity has a right to such capacity. If the Scheduling Coordinator does not indicate this status, the resource cannot be a designated resource for an export Self-Schedule at Scheduling Points backed by non-Resource Adequacy Capacity. The CAISO will notify a Scheduling Coordinator hourly, to the extent practicable, that its resource, which is flagged to support an export, is designated by another entity to support export Self-Schedules at Scheduling Points backed by non-Resource Adequacy Capacity. Upon receiving the notice, the Scheduling Coordinator for the designated resource shall notify the CAISO if it does not have a contractual commitment to support

such export Self-Schedule or does not have a reasonable expectation to be available to support the export Self Schedule. The Scheduling Coordinator for the designated resource and the Scheduling Coordinator for the export Self-Schedule shall designate a resource to support such export only if the resource is expected to have sufficient available capacity to support the export quantity throughout the entire hour. For Variable Energy Resources, this requirement can only be satisfied if the resource's forecasted output for each of the applicable four (4) fifteen (15) minute intervals at the time of bid submission is for Generation that is equal to or greater than the Self Schedule export quantity. The designated capacity must be the deliverable capacity of a resource with Full Capacity Deliverability Status, Partial Capacity Deliverability Status, or Interim Deliverability Status that is shown on the CAISO's NQC list.

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Section 31

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31.4 CAISO Market Adjustments To Non-Priced Quantities In The IFM

All Self-Schedules are respected by SCUC to the maximum extent possible and are protected from curtailment in the Congestion Management process to the extent that there are Effective Economic Bids that can relieve Congestion. If all Effective Economic Bids in the IFM are exhausted, resource Self-Schedules between the resource's Minimum Load as defined in the Master File, or if applicable, as modified pursuant to Section 9.3.3, and the first Energy level of the first Energy Bid point will be subject to adjustments by the CAISO Market optimization based on the scheduling priorities listed below. This functionality of the optimization software is implemented through the setting of scheduling parameters as described in Section 27.4.3 and specified in Section 27.4.3.1 and the Business Practice Manuals. Through this process, imports and exports may be reduced to zero, Demand Bids may be reduced to

zero, Price Taker Demand (LAP load) may be reduced, and Generation may be reduced to a lower operating limit (or Regulation Limit) (or to a lower Regulation Limit plus any qualified Regulation Down award or Self-Provided Ancillary Services, if applicable). Any Self-Schedules below the Minimum Load level are treated as fixed Self-Schedules and are not subject to these adjustments for Congestion Management. The provisions of this section shall apply only to the extent they do not conflict with any MSS Agreement. In accordance with Section 27.4.3.5, the resources submitted in valid TOR, ETC or Converted Rights Self-Schedules shall not be adjusted in the IFM in response to an insufficiency of Effective Economic Bids. Thus the adjustment sequence for the IFM from highest priority (last to be adjusted) to lowest priority (first to be adjusted), is as follows:

- (a) Reliability Must Run (RMR) Generation pre-dispatch reduction;
- (b) Day-Ahead TOR Self-Schedules reduction (balanced demand and supply reduction);
- (c) Day-Ahead ETC and Converted Rights Self-Schedules reduction; different ETC priority levels will be observed based upon global ETC priorities provided to the CAISO by the Responsible PTOs;
- (d) Internal Transmission Constraint relaxation for the IFM pursuant to Section 27.4.3.1;
- (e) ~~The export Self-Schedule of a Priority Wheeling Through~~; Self-Schedules of CAISO Demand reduction subject to Section 31.3.1.3; exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports; and Self-Schedules of exports at Scheduling Points explicitly sourced by non-Resource Adequacy Capacity;
- (f) Self-Schedules of exports at Scheduling Points not explicitly sourced by non-Resource Adequacy Capacity, except those exports explicitly identified in a Resource Adequacy Plan to be served by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports as set forth in Section

- 31.4(d), ~~and the export Self-Schedule of a non-Priority Wheeling Through;~~
- (g) Day-Ahead Regulatory Must-Run Generation and Regulatory Must-Take Generation reduction;
 - (h) Other Self-Schedules of Supply reduction, ~~and the import Self-Schedule of a Priority Wheeling Through; and~~
 - ~~(i) The import Self-Schedule of a non-Priority Wheeling Through.~~

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31.5.5 Selection and Commitment of RUC Capacity

Capacity that is not already scheduled in the IFM may be selected as RUC Capacity through the RUC process of the DAM. The RUC optimization will select RUC Capacity and produce nodal RUC Prices by minimizing total Bid cost based on RUC Availability Bids and Start-Up, Minimum Load Bids and Transition Costs. ~~If RUC cannot schedule sufficient capacity to meet the RUC Procurement Target, a RUC Award or RUC Schedule will be issued to imports providing RA Capacity for the full amount of their RA Capacity.~~ RUC will not consider Start-Up, Minimum Load Bids, or Transition Costs for resources already committed in the IFM. The RUC Capacity of a resource is the incremental amount of capacity selected in RUC above the resource's Day-Ahead Schedule. The resource's Day-Ahead Schedule plus its RUC Capacity comprise the resource's RUC Schedule. The CAISO will only issue RUC Start-Up Instructions to resources committed in RUC that must receive a Start-Up Instruction in the Day-Ahead in order to be available to meet Real-Time Demand. RUC Schedules will be provided to Scheduling Coordinators even if a RUC Start-Up Instruction is not issued at that time. RUC shall not Shut Down resources scheduled through the IFM and RUC will not commit a Multi-Stage Generating Resource to a lower MSG Configuration that is unable to support the Energy scheduled in the IFM. If the RUC process cannot find a feasible solution given the resources committed in the IFM, the RUC process will adjust constraints as described in Section 31.5.4 to arrive at a feasible solution that accommodates all the resources committed in the IFM, and any necessary de-commitment of IFM committed units shall be effectuated

through an Exceptional Dispatch.

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Section 34

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34.12.1 Increasing Supply

The scheduling priorities as defined in the RTM optimization to meet the need for increasing Supply as reflected from higher to lower priority are as follows:

- (a) CAISO Forecast of CAISO Demand; ~~the export Self-Schedule of a Priority Wheeling Through;~~ exports explicitly identified in a Resource Adequacy Plan backed by Resource Adequacy Capacity explicitly identified and linked in a Supply Plan to the exports; or Self-Schedules for exports at Scheduling Points ~~in the RTM~~ backed by Generation from non-Resource Adequacy Capacity or from non-RUC Capacity;
- (b) Day-Ahead RUC schedules that are Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity; ~~RUC Schedules that are Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity, or the RUC Schedules that are the export Self-Schedules of non-Priority Wheeling Through;~~
- (c) Real-Time Market Self-Schedules of exports at Scheduling Points not backed by Generation from non-Resource Adequacy Capacity ~~or non-RUC capacity, or the Real-Time Market Self-Schedules that are the export Self-Schedules of a non-Priority Wheeling Through;~~ and
- (d) Contingency Only Operating Reserve if activated by Operator to provide Energy (as indicated by the Contingency Flag and the Contingency condition).

34.12.2 Decreasing Supply

The scheduling priorities as defined in the RTM optimization to meet the need for decreasing Supply as reflected from higher to lower priority are as follows:

- (a) Non-Participating Load increase;
- (b) Reliability Must Run (RMR) Schedule (Day-Ahead manual pre-dispatch or Manual RMR Dispatches or Dispatches that are flagged as RMR Dispatches following the MPM, for Legacy RMR Units and Exceptional Dispatch for RMR Resources process);
- (c) Transmission Ownership Right (TOR) Self-Schedule;
- (d) Existing Rights (ETC) Self-Schedule;
- (e) Regulatory Must-Run and Regulatory Must-Take (RMT) Self-Schedule;
- (f) Participating Load increase;
- (g) Day-Ahead Supply Schedule; and
- (h) Self-Schedule Hourly Block; ~~and~~
- ~~(i) Import Self-Schedule of a non-Priority Wheeling Through.~~

These dispatch priorities as defined in the RTM optimization may be superseded by operator actions and procedures as necessary to ensure reliable operations.

34.12.3 [Not Used]

~~In the event an Intertie is constrained in the import direction by a scheduling limit or Path 26 is constrained in the north-south direction, when HASP cannot meet CAISO Forecast of CAISO Demand or fully accommodate a Priority Wheeling Through transaction, the CAISO will perform a post-HASP process to pro-rata allocate available transmission capacity between CAISO Load and Priority Wheel Through transactions, as described in the Business Practice Manual. The CAISO Load pro-rata share will be based on the lower of each applicable Resource Adequacy Resource's Real-Time Energy Bid quantity or its shown Resource Adequacy Capacity. The Priority Wheeling Through pro-rata share for each Self-Schedule will be based on the lowest of (1) 110 percent of the submitted Day-Ahead Market Self-Schedule of the Priority Wheeling Through transaction, (2) the submitted Real-Time Market Self-Schedule of the Priority Wheeling Through transaction, or (3) the Priority Wheeling Through quantity requested 45-~~

~~days in advance of the month. The available transmission capacity the CAISO awards to Priority Wheeling Through transactions in the post-HASP process cannot exceed the Priority Wheeling Through quantity the CAISO calculates in this pro rata allocation. Energy scheduled via the post-HASP process will be settled as Exceptional Dispatch Energy pursuant to Section 11.5.6.1, as applicable.~~

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Appendix A

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- [Not Used] Priority Wheeling Through

~~A Self-Schedule that is part of a Wheeling Through transaction consistent with Section 30.5.4 that is supported by (1) a firm power supply contract to serve an external load serving entity's load throughout the calendar month and (2) monthly firm transmission the external load serving entity has procured under applicable open access tariffs, or comparable transmission tariffs, for Hours Ending 07:00 through 22:00, Monday through Saturday excluding NERC holidays, from the source to a CAISO Scheduling Point.~~

Attachment G – Revised Final Proposal
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021



Market Enhancements for Summer 2021 Readiness

Revised Final Proposal

April 14, 2021

Prepared by

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Market Enhancements for Summer 2021 Readiness: Revised Final Proposal

Table of Contents

1. Executive Summary	4
2. Background	7
Root Cause Analysis Summary of Findings.....	8
3. Changes from the Final Proposal and Stakeholder Comments.....	9
4. Proposed Market Enhancements	10
Export, Load, and Wheeling Priorities.....	10
EIM Coordination and Resource Sufficiency Test Review.....	24
Market Incentives for Imports during Tight System Conditions.....	28
Real-time Scarcity Price Enhancements.....	32
Reliability Demand Response Dispatch and Real-time Price Impacts	34
Management of Storage Resources during Tight System Conditions	35
Other Items	39
5. EIM Governing Body Role	40
6. Stakeholder Engagement, Implementation Plan & Next Steps	42
Appendices.....	44
Implications of Penalty Parameters on Wheels	44
Interaction between EIM Imports and the CAISO Capacity Requirement in the Bid Range Capacity Test	52
Business Practice Manual Changes to Penalty Prices to Support FERC Order No. 831	53

1. Executive Summary

This revised final proposal describes the CAISO's proposed market enhancements to prepare for this upcoming summer in light of the performance of the CAISO markets during last summer's heat events. The proposed changes are in response to the findings in the CAISO/CPUC/CEC Root Cause Analysis¹ of last summer's controlled load shedding, the CAISO's own analysis, and stakeholder concerns.

The CAISO's objectives for these enhancements are to:

- Equitably balance the reliability of serving CAISO balancing authority area load with the reliability of exports, while providing open access to the CAISO transmission system.
- Better ensure each balancing authority area participates in the EIM with sufficient resources.
- Provide improved incentives for supply to be available during tight system conditions.

These proposed enhancements are focused on changes that will be feasible for the CAISO and stakeholders to implement by summer 2021.² The CAISO plans to address potential longer-term changes in upcoming stakeholder processes.

Despite the fast timeline of this initiative, stakeholders have provided significant timely and relevant input, which has shaped this draft final proposal.

This draft final proposal proposes the following enhancements:

Export, load, and wheeling priorities: In the Root Cause Analysis, the CAISO analyzed and discussed the implications of the scheduling priorities the CAISO market places on serving CAISO balancing area load relative to exports from the CAISO balancing authority area. In this draft final proposal, the CAISO proposes several changes.

The CAISO proposes to modify its market's penalty parameters to reconsider the scheduling priority given to exports supported by non-RA supply contracted to serve load outside the CAISO balancing authority, and wheel through self-schedules across the CAISO balancing authority area relative to CAISO load. The CAISO proposes the changes related to wheel through self-schedules will be temporary tariff changes that will be replaced by a process under development for external entities to obtain firm transmission for wheeling on a forward basis.

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.aiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf>

² The CAISO is currently targeting implementing these market changes on June 1, 2021.

The CAISO also proposes to build upon the business practice manual changes it made on September 5, 2020 to use the CAISO day-ahead market's residual unit commitment process to distinguish high priority from low priority exports purchased in the day-ahead market.

These enhancements will equitably balance the reliability of serving CAISO balancing authority area load with the reliability of exports, while providing open access to the CAISO transmission system.

EIM coordination and resource sufficiency test review: The CAISO proposes enhancements to the resource sufficiency evaluation to reflect each balancing authority area's resources required to meet their net load uncertainty. The CAISO also proposes changes to better reflect each resource's actual available capacity and other changes to more accurately model transfers between balancing authority areas. The EIM's resource sufficiency evaluation is designed to ensure each balancing authority area participating in the EIM provides sufficient resources to reliably serve its load.

These enhancements will better ensure each balancing authority area participates in the EIM with sufficient resources. Although not include in this draft final proposal, the CAISO commits to continue to explore with stakeholders potential changes to the ramifications for failing the resource sufficiency evaluation, such as potential financial consequences, shortly after the completion of this initiative. This may lead to further changes as soon as this summer if feasible and appropriate.

Import market incentives during tight system conditions: The CAISO proposes provisions for bid cost make-whole payments for real-time market hourly block economic imports that provide energy during tight system conditions. These provisions will only be triggered under pre-specified tight supply conditions. This will provide improved incentives for import supply to be available during tight system conditions because the current settlement rules may pay imports less than bid, and this risk can be exacerbated under tight supply conditions.

Real-time scarcity price enhancements: The CAISO proposes an enhancement to improve market pricing when system conditions are very tight and the CAISO is arming load to meet its contingency reserve requirements. This enhancement will price energy at the market's applicable energy bid cap that is from generation the CAISO is releasing from contingency reserves to serve load. The current market rules can decrease market prices when this occurs. This pricing policy appropriately reflects that the CAISO is short supply under these conditions and will provide improved incentives for supply to be available during tight system conditions.

Reliability demand response dispatch and real-time price impacts: The CAISO is proposing enhancements that will improve market pricing when reliability demand response resources are dispatched. Reliability demand response resources are intended to be used immediately

prior to or during emergency conditions in the CASIO balancing authority area. The Root Cause Analysis indicated that CAISO system operators manually dispatched these resources outside of the market optimization, which results in suppressed market prices. The proposed enhancements will result in the ability for the market's real-time pre-dispatch process to dispatch these resources, which will reduce their manual dispatch and allow them to set fifteen-minute market prices.

Management of storage resources during tight system conditions: The CAISO is proposing several enhancements to how its market will dispatch storage resources in phase 1 of its Resource Adequacy Enhancements stakeholder initiative.³ These enhancements are primarily discussed in that initiative but are also summarized in this draft final proposal as the CAISO proposes to implement enhancements to the CAISO's "minimum state of charge" proposal along with other changes proposed in this draft final proposal prior to this summer. The minimum state of charge requirement ensures that storage resources have enough state of charge on the tightest days to meet day-ahead discharge schedules during peak hours.

The CAISO is proposing significant modifications to the minimum state of charge requirement in the Resource Adequacy Enhancements initiative's final proposal to minimize interfering with storage's real-time market participation.⁴ The CAISO is also proposing the minimum state of charge requirement will be a temporary measure, with a two-year sunset period, while the CAISO and its stakeholders develop a market mechanism with proper market incentives to ensure energy availability for the system.

Other items: OASIS report, Interconnection enhancements, RAIM: The CAISO set aside a topic for miscellaneous items proposed by stakeholders during the scoping phase of this initiative. The CAISO will move forward with two of the three topics considered. First, the CAISO will implement an enhancement to its Open Access Same-time Information System (OASIS) to publish gross import and export schedules by intertie. Second, the CAISO will implement business practice manual and tariff changes to enhance the independent study interconnection process to provide CAISO additional capacity for summer 2021. Finally, the CAISO considered implementing changes to the Resource Adequacy Availability Incentive Mechanism (RAAIM) but decided not to pursue any changes based on implementation complexity and other issues such as implementing changes in the middle of an RA operating year when RA contracting is already complete.

³ CAISO Resource Adequacy Enhancements stakeholder initiative.

<https://stakeholdercenter.caiso.com/StakeholderInitiatives/Resource-adequacy-enhancements>.

⁴ California ISO. Resource Adequacy Enhancements Final Proposal – Phase 1. February 17, 2021

<http://www.caiso.com/InitiativeDocuments/ResourceAdequacyEnhancements-Phase1FinalProposal.pdf>.

System market power mitigation: In response to stakeholder concerns regarding the numerous changes this summer and concerns that both the CAISO and market participants have limited bandwidth to implement changes for summer 2021 implementation, the CAISO determined that the changes it previously proposed to introduce this summer were of greater priority. Consequently, it plans to focus on market enhancements that incent supply and ensure the CAISO can operate the grid reliably during constrained conditions. Given that there is no evidence that suppliers exerted system-level market power during the very tight conditions last summer, nor during other parts of the year, the CAISO believes it is more beneficial to devote its and stakeholders' limited resources to focus on the other important changes described in this proposal. Accordingly, the CAISO no longer proposes to proceed with efforts to implement the system market power mitigation measures it developed in 2020 as part of a separate stakeholder process.

The CAISO remains committed to ensuring its markets carefully balance robust pricing signals that appropriately signal scarcity conditions with adequate consumer protection measures against the exercise of market power. As such, it will continue to apply a thoughtful, deliberative, data-driven review of system-level competitive conditions in the CAISO balancing authority area. Although there was an increase in system-level pivotal supplier test failures in Q3 2020 relative to previous years, market prices have remained very competitive, even during the August heat wave.⁵ The CAISO will continue to monitor for evidence of suppliers exercising system-level market power and will take measures to address system-level market power if appropriate. The CAISO's current system market power mitigation proposal will be reconsidered and further developed if necessary in conjunction with the comprehensive scarcity pricing initiative later this year.

2. Background

A historic heat wave affected the western United States for several consecutive days in mid-August 2020, causing energy supply shortages that led to two rotating power outages in the CAISO footprint on August 14 and 15. These events were documented in the CAISO/CPUC/CEC Final Root Cause Analysis.⁶ The CAISO initiated this expedited initiative in response to these

⁵ California ISO Department of Market Monitoring. Report on system and market conditions, issues and performance: August and September 2020. November 24, 2020.

<http://www.caiso.com/Documents/ReportonMarketConditionsIssuesandPerformanceAugustandSeptember2020-Nov242020.pdf>

⁶ 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>

events and is committed to the development of actions to prevent supply gaps in advance of summer 2021.

Where appropriate, the policy changes proposed in this stakeholder initiative aim to be responsive to findings in the Final Root Cause Analysis. The following section summarizes the primary findings of the Final Root Cause Analysis.

Root Cause Analysis Summary of Findings

On January 13, 2021, the CAISO, CPUC, and CEC produced a Final Root Cause Analysis of two rotating outages in the CAISO footprint on August 14 and 15, 2020. The Final Root Cause Analysis finds that the three major causal factors contributing to the August outages were as follows:

1. **The climate change-induced extreme heat wave experienced across the western United States resulted in demand for electricity exceeding existing electricity resource adequacy and planning targets.** The extreme heat wave experienced in August was a 1-in-30 year weather event in California. In addition, since extreme heat wave extended across the western United States, resources in neighboring areas were strained.
2. **In transitioning to a reliable, clean, and affordable resource mix, resource planning targets have not kept pace to ensure sufficient resources that can be relied upon to meet demand in the early evening hours.** This made balancing demand and supply more challenging during the extreme heat wave. The rotating outages both occurred after the period of gross peak demand, during the “net demand peak,” which is the peak of demand net of solar and wind generation resources. With today’s new resource mix, behind-the-meter and front-of-meter (utility-scale) solar generation declines in the late afternoon at a faster rate than demand decreases. These changes in the resource mix and the timing of the net peak have increased the challenge of maintaining system reliability, and this challenge is amplified during an extreme heat wave.
3. **Some practices in the day-ahead energy market exacerbated the supply challenges under highly stressed conditions.** A subset of energy market practices contributed to the inability to obtain or prioritize energy to serve CAISO load in the day-ahead market that could have otherwise relieved the strained conditions on the CAISO grid on August 14 and 15. The practices that obscured the tight physical supply conditions included under-scheduling of demand in the day-ahead market by load serving entities or their scheduling coordinators and convergence bidding reflecting financial supply positions. In addition, the combination of existing real-time scheduling priorities and a previously implemented market enhancement inadvertently caused the CAISO’s markets to fail to account for the obscuring effects of under-scheduling and convergence bidding during August’s stressed operating conditions.

3. Changes from the Final Proposal and Stakeholder Comments

The CAISO appreciates the wide array of comments received from a large segment of market participants and stakeholders. It is a testament to the close engagement of the stakeholder community on this initiative, which is vital to its success. The CAISO has carefully considered all stakeholder input in developing this revised final proposal. The CAISO has made every effort to balance the diverse viewpoints of its stakeholders while adhering to principles of sound market design and utility practice. Table 1 summarizes the changes reflected in this revised final proposal.

Table 1: Changes from Final Proposal and Reasons for Proposed Changes

Topic	Change from Final Proposal	Reason for Proposed Change
Export, Load, and Wheeling Priorities	The Master File flag that allows a resource to be a designated resource to support a PT export is by default “No”, not eligible to support a PT export.	Corrected language of prior proposal.
Export, Load, and Wheeling Priorities	Revised the requirement for PT wheel eligibility from requiring the existence of a contract to serve load outside the CAISO balancing authority area as of the filing date of the proposed tariff changes with FERC to rather require such a contract by June 29, 2021, for July and August 2021, and 45 days prior to the month for subsequent months. The designation of the maximum PT wheel MW quantity and LSE procurement of monthly firm transmission to CAISO border will be required on this same timeline.	In response to stakeholder comments that requirements for CAISO imports and PT wheels were not balanced. Eligibility aligns with the 45 day in advance monthly showing requirement of RA supply. The requirement for LSE procurement of monthly firm transmission shows an external LSE’s dependence on using the CAISO system to routinely serve its load, demonstrating a similar level of dependence and commitment as CAISO load serving entities.
Export, Load, and Wheeling Priorities	The PT wheel quantities used in the post-HASP pro-rata allocation will be based on the lowest of 1) 110 percent of the submitted day-ahead market PT wheel self-schedule, 2) the submitted real-time market PT wheel self-schedule, or 3) the PT wheel	In response to stakeholder concerns that if the bulk PT wheels are scheduled in the real-time and not the day-ahead, the day-ahead market solution would be unreliable and potentially result in an infeasible real-time market.

	quantity requested 45-days in advance of the month.	
Export, Load, and Wheeling Priorities	The post-HASP pro rata allocation will use the total amount of RA import bids (including self-schedules) in the real-time market, and not the maximum of the total RA imports in the real-time and RUC imports, as previously proposedd.	In response to stakeholder comments that the previous proposal would prioritize CAISO imports beyond RA commitments.
Export, Load, and Wheeling Priorities	Changed sunset date for wheel through provisions from December 31, 2021 to May 31, 2022.	In response to stakeholder comments, provides additional time to address longer-term design changes prior to summer 2022.
Export, Load, and Wheeling Priorities	Described changes to outage and derate process that scheduling coordinators need to follow for resources that have sold both RA supply and non-RA supply to support a PT export.	In response to stakeholder concerns, ensures accurate accounting of capacity between RA supply and non-RA supply.

4. Proposed Market Enhancements

Export, Load, and Wheeling Priorities

Issues

Based on the Root Cause Analysis and related discussions and analysis, the CAISO has determined it is appropriate to modify the relevant priorities the CAISO market places on serving CAISO balancing authority area load relative to exports from and wheeling schedules across the CAISO balancing authority area. Consequently, the CAISO proposes the changes outlined in this section to improve CAISO balancing authority area reliability, while maintaining open access to its transmission system. The CAISO recognizes it is part of a broader electric system and market in the west and believes it is appropriate to provide comparable “firmness” of exports other balancing authority areas provide.

The CAISO seeks to address the following issues related to load, export, and wheeling scheduling priorities in its day-ahead and real-time markets:

- **Build upon CAISO business practice manual changes made on September 5, 2020 to increase the use of the residual unit commitment process to distinguish high priority**

exports from low priority exports. Following the August heat events, the CAISO changed its scheduling and tagging processes because they were not appropriately accounting for the CAISO load forecast relative to integrated forward market schedules, particularly the amount of virtual supply scheduled in the integrated forward market. This caused the scheduling and tagging processes to erroneously determine the system could physically support more exports than it actually could.

On September 5, 2020, the CAISO changed two rules in the CAISO business practice manual to resolve this issue. First, the CAISO clarified the RUC process will use schedules from the scheduling run instead of schedules from the pricing run. The CAISO determined it is more effective to use the RUC's scheduling run to ensure export curtailments are reflected correctly. Second, the CAISO clarified it will use RUC schedules for exports, instead of integrated forward market schedules, to determine the day-ahead export amounts that can be tagged, and if not re-bid in, inserted as self-schedules into the real-time market. That is, the RUC schedule would determine the quantity market participants should tag when the export e-Tag is submitted in the day-ahead timeframe. This initiative builds upon these changes to ensure export schedules are physically feasible to ensure more reliable market outcomes.

- **Modify the scheduling priority of exports not supported by contracted non-RA supply relative to CAISO load.** The CAISO Department of Market Monitoring's report on the August heat events⁷ showed significant quantities of self-scheduled exports were not supported by contracted-for, non-RA supply. This increased the overall demand that had to be met in the real-time market because exports not supported by physical supply were passed from the RUC commitment process into the real-time market, and they were not subsequently curtailed in real-time hours when CAISO load was curtailed. The changes proposed in this initiative ensure the market will appropriately curtail lower priority exports so CAISO real-time load is served rather than exporting energy from resource adequacy capacity during tight system conditions. The proposed changes still ensure exports from resources contracted to serve load outside of the CAISO balancing authority area receive the same priority as the CAISO's own load. This is to ensure the CAISO market's priorities for supporting exports is consistent with the practices of other balancing authority areas in the west.
- **Differentiate the scheduling priority of high priority and low priority wheel through self-schedules across the CAISO balancing authority area and develop a post-HASP**

⁷ California ISO Department of Market Monitoring. Report on system and market conditions, issues and performance: August and September 2020, p.2. November 24, 2020.
<http://www.caiso.com/Documents/ReportonMarketConditionsIssuesandPerformanceAugustandSeptember2020-Nov242020.pdf>

process to equitably allocate import capability between high priority wheels and imports needed to meet CAISO load. Today, all self-scheduled wheels effectively have higher scheduling priority than CAISO load. If there is congestion at the intertie scheduling point or internal congestion, the market sees the cost to curtail the wheel as including both the penalty price of curtailing the export and the penalty price of curtailing the import. The use of penalty prices alone is insufficient to equitably allocate import capability and internal transmission use between wheels and imports to serve native load. The CAISO proposes a process to be performed after HASP in the event an import limit is binding and the power balance constraint was relaxed in HASP. These changes would be temporary and would only remain in effect until **May 31, 2022**.

Export and Load Priority Workshop January 12, 2021

The CAISO recognizes its market functions in the context of the broader western interconnection and seeks to provide assurance it will deliver exports comparable to what other balancing authority areas in the west provide. To better understand other balancing authority areas' practices, the CAISO conducted a stakeholder workshop on January 12, 2021 to discuss its market's priorities for serving load relative to export schedules and to discuss other balancing authority areas' practices. Idaho Power Company shared its practices as a representation of the general practices across the western interconnection.⁸ However, the CAISO also understands that these practices are not necessarily documented in other balancing authority areas' Open Access Transmission Tariffs. Based on the Idaho Power Company presentation and accompanying discussion, the CAISO understands that other balancing authority areas decide whether to honor export schedules relative to serving their own load depending on whether the situation involves transmission limitations or an energy shortage.

If transmission is constrained, the CAISO understands other balancing authority areas will curtail schedules in reservation priority order, including transmission schedules supporting exports from the balancing authority area, to resolve the transmission constraint. These curtailments occur in NERC transmission reservation priority order, under the balancing authority area's Open Access Transmission Tariff. Deliveries on non-firm transmission service are curtailed before deliveries on firm transmission service, which are curtailed last. Accordingly, export transmission schedules are subject to potential curtailment depending upon the transmission service priority utilized for the export schedule.

If an energy shortage occurs and the load serving function of the balancing authority area has entered into a firm power contract (where delivery can contractually be interrupted for

⁸ Idaho Power Company. Export and Load Schedules presentation at the CAISO workshop. January 12, 2021. <http://www.aiso.com/InitiativeDocuments/IdahoPowerPresentation-MarketEnhancements-Summer2021Readiness-Jan122021Workshop.pdf>

reliability reasons) from its own resources, it will not interrupt that firm power delivery. For example, it was noted a balancing authority area's load serving function would generally seek not to interrupt power deliveries because interrupting the export could adversely affect the receiving balancing authority area and potentially cause cascading outages across other balancing authority areas, particularly if the energy shortage affects the larger western footprint.⁹

Similarly, the CAISO understands balancing authority areas generally will not interrupt exports from third-party, non-affiliated generators that are not committed to serve the balancing authority area's own load during an energy shortage because the balancing authority area does not have rights to that generator's capacity. One exception is that if, in real time, the third-party generator supporting an export is not generating (e.g., due to forced outage) or is under-generating compared to its transmission exporting schedule, the balancing authority area may curtail the schedules to a level commensurate with generator production to avoid exacerbating the energy shortage and associated imbalance.

Current CAISO Market Scheduling Priorities for Exports, Load, and Wheels

Scheduling coordinators may self-schedule load, exports, and/or wheels in the CAISO markets. The CAISO only has one category of transmission not associated with existing rights – new firm use.¹⁰ The CAISO does not require transmission reservations to manage the priority of schedules to address system constraints. The CAISO manages schedules on its grid through the day-ahead and real-time markets and applies scheduling priorities defined in its tariff to conduct curtailments of self-schedules (i.e., price taker bids) in its markets. The CAISO markets honor these self-schedules if there is sufficient generation and transmission capacity to support them. If there is insufficient supply or binding transmission constraints, the CAISO markets will curtail self-schedules to clear the market. The market software determines the priority order in which the various types of self-schedules are curtailed using market parameters known as “penalty prices”.¹¹ These penalty prices are set to specific values to (1) determine the conditions under which a constraint may be relaxed or a self-schedule may be curtailed and (2) establish the market prices when these events happen.

In the day-ahead market, self-schedule curtailments can also occur in the residual unit commitment (RUC) process after the day-ahead integrated forward market is run. The RUC process ensures there is sufficient physical supply to meet the CAISO forecast of CAISO demand. Under normal circumstances, the RUC process commits additional capacity to ensure

⁹ Additionally, a supplier's reputation may be damaged if it interrupts firm power export contracts because out-of-BAA parties may not be willing to contract in the future if the supplier does not honor the export.

¹⁰ CAISO tariff section 23.

¹¹ Although self-schedules with the same scheduling priority may be designated the same penalty prices, they may or may not be curtailed equally due to congestion, loss factors, etc.

there are sufficient resources available to serve load in real time. When there is insufficient capacity, the RUC process either curtails integrated forward market export schedules or, at the extreme, does not schedule sufficient supply to meet the CAISO balancing authority area's load forecast. The RUC process determines what portion of the day-ahead schedules are physically feasible based on power balance and intertie constraints.

In the day-ahead market, the scheduling priority of exports relative to load depends on whether the exporting scheduling coordinator designates a resource with non-RA capacity as supporting the export. If a scheduling coordinator identifies an export self-schedule as supported by non-RA capacity, that export receives equal scheduling priority as CAISO self-scheduled load in IFM and the CAISO load forecast in RUC. These exports are referred to as "Price Taker (PT)" exports. Any export self-schedules that do not identify non-RA capacity supporting the export will still be price takers, but they will have lower scheduling priority than CAISO self-scheduled load and demand forecast. These exports are referred to as "Lower Price Taker (LPT)" exports. That means if there is insufficient supply or binding transmission constraints, these LPT exports will only clear if there is sufficient supply to first serve self-scheduled CAISO load or demand forecast and PT exports. This ensures CAISO resource adequacy capacity cannot be used to support exports when it is needed to serve CAISO load. Finally, if there is sufficient supply to clear all self-scheduled day-ahead export and load self-schedules, economic load and export bids will be considered.

The CAISO uses a validation process to ensure a resource supporting a PT export is eligible to be designated. When a scheduling coordinator submits a PT export, it provides the self-schedule MW amount and identifies a supporting resource. The CAISO validates that the designated resource has sufficient non-RA supply participating in the market to support the export by comparing the resource's upper economic limit (i.e., the highest operating level in the resource's energy bid) to the resource's designated resource adequacy capacity. Any MW quantity exceeding the designated resource's available non-RA capacity will be given LPT priority. This validation only occurs in the day-ahead market; the CAISO does not re-verify the non-RA capacity in the real-time market if it is scheduled in RUC because all RUC exports receive the same real-time priority.¹² In addition, the validation process does not consider outages, commitment status, or deliverability of the designated resource.

Currently, if export and load self-schedules and economic bids are cleared in the integrated forward market and deemed physically feasible in the RUC process, they receive the highest level of priority (including over CAISO real-time load) when self-scheduled in the real-time

¹² The CAISO does verify incremental PT exports submitted in the real-time market are supported by non-RA capacity above the designated resource's RUC schedule.

market.¹³ The market respects that high priority level in real time regardless of what priority the export was considered (i.e., PT, LPT, economic) in the day-ahead market. Effectively, this means the CAISO's market parameters currently prioritize the delivery of exports deemed physically feasible from the day-ahead market even if in that interval CAISO determines it must shed load in the CAISO balancing authority area because system conditions have changed.

Scheduling coordinators can submit incremental self-scheduled exports in the real-time market that are in addition to any day-ahead schedule. If these real-time self-scheduled exports designate a supporting non-RA resource, they receive equal priority as CAISO load in real-time and a higher priority than any new LPT exports submitted in real time (but lower priority than feasible day-ahead exports). Consistent with day-ahead market priorities, new LPT export schedules in the real-time market have higher priority than any economic export bids.

In addition to self-scheduling load and exports, scheduling coordinators can also self-schedule wheeling transactions through the CAISO system. Wheel through self-schedules consist of both an import self-schedule and an export self-schedule and can be specified between any two scheduling points in the CAISO system. A constraint in the market exists to ensure wheel through transactions are kept balanced (i.e., the import quantity equals the export quantity). This constraint respects the penalty factors associated with curtailment of both the import self-schedule and the export self-schedule. These penalty factors are additive. Combined, they give self-scheduled wheel throughs a higher scheduling priority in the market than both PT exports and load.¹⁴ Scheduling coordinators can also submit wheel throughs using economic bids, with both the import and export legs providing economic bids. If there is sufficient supply to support all self-schedules, wheels and exports with economic bids compete for the remaining transmission capacity.

Figure 1 summarizes these day-ahead and real-time market scheduling priorities, listed in order of highest priority to lowest priority.

¹³ During the August heat wave, any export cleared in the integrated forward market received higher scheduling priority than CAISO load in the real-time market. The CAISO implemented an emergency BPM change on September 5, 2020 that modified its process to give this high scheduling priority only to day-ahead exports determined to be physically feasible in the RUC process. This means that exports scheduled in the integrated forward market but curtailed in the RUC process will have a lower scheduling priority than CAISO load in the real-time market.

¹⁴ In the event imports are self-scheduled and create congestion at the intertie scheduling point, the penalty price to relax a self-scheduled import is additive to the load scheduling priority in IFM and the load forecasted priority in RUC.

Figure 1: Current Market Scheduling Priorities

- **Day-Ahead Market**
 1. SS Wheel
 2. PT Export & Load
 3. LPT Export
 4. Economic Export & Economic Wheel
- **Real-Time Market**
 1. SS Wheel
 2. RUC Export
 3. PT Export & Load
 4. LPT Export
 5. Economic Export & Economic Wheel

Proposals and Rationale

Proposed Scheduling Priorities for Exports and Load

The CAISO proposes the following scheduling priorities for export and load schedules:

- **PT exports will continue to have equal priority to CAISO load in all markets.** The same policy exists today but this is a change from the straw proposal that proposed PT exports have higher priority than load in all markets. Several stakeholders opposed providing PT exports higher priority. Stakeholders also requested additional validation steps to ensure non-RA resources have available energy to support the transaction. Validation of designated supply currently does not consider outages, commitment status, or deliverability. In addition, there is not a direct link between the supporting resource's output and the export quantity. Implementing the necessary validation rules to confirm the generation is available and generating is complex, and the CAISO is unable to implement by summer 2021. However, the CAISO is further defining what providing "non-RA supply" in subsequent sections.
- **PT exports must re-declare a supporting resource in its real-time market bid to maintain its PT status.** Today, there is no requirement a scheduling coordinator re-declare a supporting resource in the real-time market because all exports that have received a RUC schedule automatically have a higher scheduling priority than load in

real-time. Having the scheduling coordinator re-declare a supporting resource ensures the market can verify that in real time there is sufficient non-RA generation bid into the market to support the high priority export. If a supporting resource is not designated in the real-time market bid, the export will be assigned lower real-time market priority than PT exports but higher priority than new LPT exports submitted in the real-time market to encourage forward contracting and scheduling of exports.

- **LPT and economic exports that receive a day-ahead market schedule will have a lower priority than CAISO load.** This change is foundational to ensure lower priority exports (i.e., exports not backed by non-RA supply) will be appropriately curtailed by the market to minimize the export of RA capacity dedicated to CAISO load during tight system conditions. Unlike the current practice where all exports that receive a RUC schedule automatically have a higher scheduling priority than load in real-time, only PT exports that have secured capacity from a non-RA resource will receive high priority in the real-time market. This change is appropriate because the CAISO cannot determine when clearing the day-ahead market if the export is supported by RA or non-RA supply. Unlike other balancing authority areas in the west, the CAISO determines schedules through a market optimization and therefore cannot determine if available system capacity is not needed to serve CAISO load until after the hour ahead scheduling process (HASP) is completed. After the HASP, LPT and economic hourly block schedules cannot be curtailed by the market optimization because the schedules are held fixed in subsequent market runs. The CAISO can provide similar treatment to exports supported by non-RA supply as other balancing authority areas in the west by providing equivalent scheduling priority to CAISO load. This respects that non-RA capacity is contracted with a load serving entity outside of the CAISO balancing authority area, similar to the treatment RA resources from specified resources in the source balancing authority area are provided to CAISO RA imports.
- **LPT exports and economic exports that are deemed feasible in RUC and are self-scheduled into the real-time market will receive higher priority than new LPT exports and economic exports bidding in the real-time market.** The market will honor any export deemed feasible in RUC to the extent possible over new exports submitted in the real-time market to encourage forward scheduling of exports. That means if there are supply insufficiencies, incremental exports submitted in the real-time market will be curtailed before exports backed by a day-ahead RUC schedule.
- **The CAISO will notify the scheduling coordinator of the designated resource when its resource supports a PT export, and will add a tariff rule stating that by allowing the resource to be designated, the scheduling coordinator of the resource attests the generation has been forward contracted with an external load serving entity.** This allows the CAISO to ensure designated resources are under contract to serve load in

another balancing authority area. Capacity under contract to CAISO load serving entities cannot support a high priority export. This proposed tariff rule seeks to address the concern of resources designating capacity above their net qualifying capacity (NQC) to support an export. Variable energy resources and other use-limited resource types may have upper economic limits that differ greatly from their NQC capacity shown for resource adequacy purposes. For example, a 100 MW solar resource may have only 20 MW of NQC shown on a resource adequacy supply plan even though a load serving entity has procured the entire resource. Such a resource could potentially submit bids up to 100 MW depending on its forecasted energy. Designating capacity above a resource's NQC to support an export is unfair because (1) although the additional MW of capacity cannot be shown on a resource adequacy plan, a CAISO load-serving entity may have contracted for the entire resource, (2) resource performance both above and below NQC are used to determine the NQC of the resource for RA purposes, and (3) the resource owner could double sell its capacity if its designated capacity to support an export overlaps with its RA must-offer obligations under the CAISO tariff. The CAISO will rely on the aforementioned tariff rule because developing a process whereby the CAISO would validate actual contractual arrangements between exporters and internal resource owners would be too complex. The CAISO is creating a new Master File flag that the resource scheduling coordinator should select if it is ~~unable~~ to attest to the rules above, ~~which will prevent the resource by being designated by a scheduling coordinator of an export.~~ By default, the Master File flag is set to "No", which indicates it is not able to be a designated resource for a PT export.

- **The CAISO will add a tariff rule stating that by allowing the resource to be designated, the scheduling coordinator of the resource attests that the resource is capable at the time of bid submission of supporting an hourly block schedule in the relevant operating hour equal to the PT export quantity.** Certain resource types may be unable to sustain their fixed MW quantity over the entire course of a block hourly schedule. Self-schedule bids can only clear the day-ahead market and real-time market as a block hourly schedule. Such export schedules should not have a high priority as they could cause the CAISO to support the export from other supply to the detriment of other demand because the designated resource is unable to sustain an hourly block schedule. A variable energy resource not contracted to meet resource adequacy can meet this attestation if the forecast of the resource can support the export quantity in all 15-minute intervals. For example, assume the forecast for interval 1 is 50MW, interval 2 is 45MW, interval 3 is 55MW and interval 4 is 60MW, this resource could support a 45MW PT export.
- **Scheduling coordinators of energy only resources will be excluded from being designated to support a PT export.** These resources have not completed a deliverability

assessment in the generator interconnection process and thus cannot ensure deliverability. Because such resources cannot sustain an hourly block schedule if there is local congestion, the resource should not be designated to support a high priority export.

- **PT exports must designate a resource internal to the CAISO.** Exporters cannot designate an import to support a PT export. These transactions can bid properly as a self-schedule wheel through. The CAISO is clarifying that only generating resources can be a designated resource.
- **Designated resources must participate in RUC up to the export self-scheduled quantity.** If a supporting resource does not receive an IFM schedule equal to or greater than the corresponding PT export, the supporting resource must submit a RUC availability bid up to the export self-scheduled quantity. If virtual supply or bid-in load clears below the CAISO forecast, additional physical resources will be committed in RUC. If a scheduling coordinator of the designated supporting resource submits a RUC bid quantity and price in excess of the PT export quantity, the portion up to the PT export quantity will be set to \$0.00/MWh. The portion above the PT export quantity will be set to the submitted RUC availability bid price.

This rule ensures that resources supporting a PT export and resource adequacy resources supporting CAISO load are considered equally when evaluating the resources needed to meet overall demand (the CAISO load forecast and PT exports). Otherwise, designated resources could bid high to avoid being committed to serve their share of demand. It would also not be equitable to allocate RUC costs to CAISO load serving entities driven by non-zero RUC bids submitted for a resource designated to support an export. The implementation of the RUC changes may not be implemented on July 1, 2021 in the event additional implementation resources are needed to implement the load, wheel, and PT export scheduling priorities.

- **If the supporting resource for a PT export does not receive a RUC schedule, the scheduling coordinator must rebid the resource in the real-time market for the export to maintain PT priority.** This ensures the real-time market has sufficient bids to support the export if system conditions change between day-ahead and real-time. Without a RUC schedule, a designated resource would otherwise have no obligation to offer in the real-time market. If the export does not rebid in real-time with a designated resource, the export's real-time scheduling priority will be equivalent to a day-ahead LPT export or economically bid export (i.e., lower priority than CAISO load but higher priority than new LPT exports) up to its RUC award.
- **If a designated resource receives a RUC schedule, real-time bids for the designated resource will be generated even if the scheduling coordinator does not re-bid the**

export. This rule currently applies to any resource receiving a RUC schedule because all resources with a RUC award have a real-time must-offer obligation.

- **Clarify how outages affect RA and non-RA capacity on a resource that has been designated to support a PT export.** The scheduling coordinator for the resource will notify the CAISO whether and to what extent the outage affects RA capacity and any contracted non-RA capacity. The scheduling coordinator will promptly notify the CAISO of any changes to this information. The CAISO will incorporate this information into determining RA substitute capacity requirements. When a scheduling coordinator notifies the CAISO of a forced outage that constitutes only a partial derate of the resource, it shall indicate the amount of the derate and how the derated capacity should be allocated among RA capacity and capacity designated to support a self-schedule of exports at scheduling points explicitly sourced by non-resource adequacy capacity. If a resource adequacy resource goes on a forced outage, until the scheduling coordinator provides the information requested above, the CAISO shall determine if the Master File flag is set to “Yes” indicating the resource can be a designated resource for a PT export. If the scheduling coordinator has indicated capacity from its resource adequacy resource is backing a PT export, the CAISO will allocate the derated capacity pro rata between the RA capacity and the remainder of the resource’s capacity up to its PMax.
- **PT status in real-time can be provided through two means:** (1) the lower of the designated resource’s RUC schedule or day-ahead export RUC schedule because the CAISO automatically generates bids for RUC awards and (2) a designated resource bid into the real-time market with available non-RA capacity above the resource’s RUC schedule. The same scheduling priority in real-time applies in both situations. Table 2 provides numerical examples to help explain these points. Export A is a 100MW export self-schedule with Generator A as a designated supporting resource. Generator A bids 80MW in the day-ahead market. It receives an 80MW schedule in IFM but is curtailed to 60MW in RUC. That means Export A can only receive 60MW of day-ahead PT priority and the remaining 40MW is day-ahead LPT priority. However, in the real-time market, Generator A provides 120MW of bids and Export A increases their bid quantity to 140MW. If a designated resource bids into the real-time market above its RUC schedule, that quantity can be used to support a PT export. The remaining 20MW of Export A’s bid that is not supported by Generator A has scheduling priority of a new LPT bid submitted in the real-time market (i.e., lower scheduling priority than load and day-ahead exports). The remaining examples follow a similar logic.

Table 2: Export Priority Examples

Resource	DAM Bid	Supporting Resource	DAM Priority	IFM Schedule	RUC Schedule	RTM Bid	Supporting Resource	RTM Priority
Export A	100	Generator A	80 DAPT 20 DALPT	100	100	140	Generator A	60 DAPT 60 RTPT 20 RTLPT
Generator A	80			80	60	120		
Export B	100	Generator B	80 DAPT 20 DALPT	100	100	140	Generator B	60 DAPT 10 RTPT 30 DALPT 40 RTLPT
Generator B	80			40	60	70		
Export C	100	Generator C	80 DAPT 20 DALPT	100	100	140	Generator C	60 DAPT 60 RTPT 20 RTLPT
Generator C	80			0	60	120		

Note: The scheduling priorities are DAPT = RTPT = Load/Demand > DALPT > RTLPT

Proposed Scheduling Priorities for Wheels

The CAISO proposes the following scheduling priorities for wheels:

- Establish high priority and low priority self-scheduled wheel throughs.** Currently, all self-scheduled wheel throughs have higher priority than PT exports and serving native load from imports and internal generation that have not self-scheduled. The CAISO proposes that the new low priority wheels will have the penalty price for their import leg set to \$0 and the penalty price for the export leg set equivalent to LPT exports. The CAISO proposes to use the same penalty prices as ~~currently~~ implemented for high priority wheels. As a result, the import leg of the wheel will be equivalent to self-scheduled imports and the export leg of the wheel bid will be equivalent to PT exports **and CAISO load**. In order to qualify as a high priority wheel, a contract **must be entered into to serve load** outside the CAISO balancing authority area **for the month**. ~~must be entered into prior to the filing date of these proposed changes with FERC.~~ The scheduling coordinator must notify the CAISO 45 days ahead of the month the MW quantity of the wheel **for the month** and confirm that **the load serving entity** has procured monthly **firm peak transmission service to serve the contract** to the CAISO boundary from an external balancing authority area. **For July and August 2021, the scheduling coordinator must notify the CAISO by close of business June 29, 2021.**¹⁵ This demonstrates the **external load serving entity is relying on** using use the CAISO system to serve load by wheeling through the CAISO system. The scheduling coordinator will then need to establish an export system resource in the Master File so that the wheel

¹⁵ The timing of the FERC filing will not allow for 45 days advance notice for July and August.

can receive high priority in the market. During the April 14, 2021 stakeholder call, several parties suggested the CAISO should add a day-ahead must-offer obligation for PT wheels given the concern that if RUC is unaware of actual PT wheels in real-time that this could cause reliability concerns. The CAISO does not believe a day-ahead must-offer obligation can fully address these concerns because an additional rule would be needed that limited the amount of incremental PT wheels that could be scheduled in the real-time market. Although RA imports must offer into the day-ahead market and they do not have a real-time must-offer obligation absent a RUC schedule. RA imports can voluntarily submit real-time bids in excess of their RUC schedule. The RA import bids that are submitted into the real-time market are included in the post-HASP allocation. Not allowing PT wheels to submit incremental schedules would be inconsistent with RA imports being allowed to submit incremental real-time schedules above its RUC schedule. However, it is the CAISO's expectation that PT wheels will participate in the day-ahead market at a quantity necessary to meet the external entity's resource adequacy needs met by the PT wheel for the vast majority of the hours of the contract. If the PT wheels fail to participate in the day-ahead market, the CAISO will have missed the opportunity to address the impact of these schedules in the day-ahead. This could result in unreliable day-ahead schedules and would force the CAISO to have to address the infeasibilities in the real-time during which the CAISO has fewer options. Therefore, to ensure that the bulk of the PT wheels will be scheduled in the day-ahead market, the post-HASP pro-rata process for PT wheels will be based on the lesser of 1) 110 percent of the submitted day-ahead market PT wheel self-schedule, 2) the submitted real-time market PT wheel self-schedule, or 3) the PT wheel quantity requested 45-days in advance of the month.

- These changes would be temporary and would only remain in effect until **May 31, 2022**. Absent a subsequent FERC filing by the CAISO, starting June 1, 2022 the penalty price for the import leg of any wheel through self-schedule would be equal to self-scheduled imports and the export leg of any wheel through self-schedule will be equal to CAISO load. The requirement that economic wheel through transactions bid the import leg greater than or equal to \$0/MWh will also be eliminated. The CAISO will refile these proposed changes or other enhancements developed through the longer term stakeholder process in the event the CAISO believes they are needed beyond **May 31, 2022**.
- **Create a new process after HASP to equitably allocate import and internal transmission to high priority wheels and native load.** The use of penalty prices alone will be insufficient to equitably allocate import capability and internal transmission between high priority wheels and CAISO load. Low priority exports may clear HASP in the event high priced imports or internal generation are needed to meet native load. In

this post-HASP process, all low priority wheels will be set to 0 MW prior to the allocation between higher priority wheels and native load. The CAISO will then apply a pro rata allocation method for allocating transmission capacity among ~~import RUC self-schedules~~, RA import bids or self-schedules, and high priority wheeling self-schedules on an intertie that is constrained in the import direction by a scheduling limit, when the HASP optimal solution shows uneconomic adjustments among said schedules or load. The CAISO will also apply a similar pro rata allocation method for allocating southbound transmission capacity on Path 26, among ~~RUC self-schedules~~, RA import bids or self-schedules and high priority wheeling self-schedules when Path 26 is constrained in the north-south direction, and when the HASP optimal solution shows uneconomic adjustments among said schedules and/or load. The additional imports and internal generation that did not clear HASP will be scheduled in merit order. **These changes would be temporary and would only remain in effect until May 31, 2022. The CAISO may refile these proposed changes or other enhancements developed through the longer term stakeholder process in the event the CAISO believes they are needed beyond May 2022.**

Figure 2 summarizes the proposed scheduling priorities, listed from highest to lowest, beginning summer 2021.

Figure 2: Proposed Market Scheduling Priorities

- **Day-Ahead Market (RUC)**
 1. PT Wheel
 2. PT Export & Load
 3. LPT Export & LPT Wheel
 4. Economic Export & Economic Wheel
- **Real-Time Market**
 1. PT Wheel
 2. PT Export & Load
 3. RUC Export w/o Gen & RUC LPT Wheels
 4. LPT Export & LPT Wheels
 5. Economic Export & Economic Wheel

Additional detail on the implications of this proposal on wheels can be found in the Appendix.

EIM Coordination and Resource Sufficiency Test Review

Issues

The Western Energy Imbalance Market (EIM) has provisions for a resource sufficiency evaluation to ensure each balancing authority area participating in the EIM provides sufficient resources to reliably serve its load to prevent inappropriate “leaning” on the capacity procured by other balancing authority areas. The market freezes transfers at their previous level in the event a balancing authority area fails the resource sufficiency evaluation.

One component of this evaluation is the bid range capacity test. This test is applied to all EIM balancing authority areas at T-75, T-55 and T-40 to the hour, and is used to validate that a balancing authority area possesses sufficient capacity to meet its load and export obligations. As currently implemented, a failure of the bid range capacity or the flexible ramping capacity components of the resource sufficiency evaluation will result in an EIM balancing authority area’s EIM transfer limit being fixed at the results of the most recently passed interval.

The Final Root Cause Analysis stated that the CAISO balancing authority area only failed the more restrictive flexible ramping sufficiency portion of the resource sufficiency evaluation for less than two hours on each August 14 and 15. The CAISO balancing authority area did not fail the resource sufficiency evaluation's bid range capacity test. During this period, the CAISO experienced multiple hours of energy emergency, including two separate firm load-shedding events. The ability for a balancing authority area to pass the bid range capacity test during these emergency conditions indicate there may be shortcomings in either the design or implementation of the test.

During its review of the August 2020 events, the CAISO identified two defects relating to the implementation of the bid range capacity test. The first defect related to resource rerates and derates not being reflected in the capacity available for the test. The second defect related to inadvertent double counting of "mirror resources," which the CAISO market uses to model transfers between balancing authority areas. The events of September 6 between the Arizona Public Service and the CAISO balancing authority areas highlighted additional areas of potential improved coordination between EIM balancing authority areas.

The August 2020 events also pointed to the potential need to revise the consequences for failing the resource sufficiency evaluation. Some stakeholders contend it is inequitable to allow transfers without additional consequences when a balancing authority area fails the resource sufficiency evaluation, particularly when the balancing authority area is unable to meet its own load.

A theme in the comments provided by stakeholders is that additional enhancements to the resource sufficiency evaluation are needed to ensure it accurately captures whether a balancing authority area in the EIM is providing sufficient resources to serve its load without leaning. A wide range of stakeholders support the CAISO facilitating further discussions to ensure the resource sufficiency evaluation meets this objective. Although, additional enhancements are not feasible to implement in the short time available to develop and implement enhancements prior to summer 2021, the CAISO plans to explore additional enhancements in a separate stakeholder process starting in the near future.

Multiple stakeholders contend that the current penalty of freezing incremental transfers is not sufficient to prevent balancing authority areas participating in the EIM from leaning. Stakeholders highlighted in their comments that systemic leaning may be the result of forward capacity procurement decisions for a balancing authority area, with the failure of the resource sufficiency evaluation being a symptom of these decisions. They maintain that it is imperative for the CAISO to continue to work with stakeholders to develop further measures to increase disincentives against leaning and promote more equitable market participation. Some have suggested that a significant financial penalty should be assessed when transfers occur into a

balancing authority area during periods when it is short on resources and fails the resource sufficiency evaluation.

Although the CAISO does not believe it is feasible to develop a penalty proposal on the implementation timeline of this initiative, the CAISO plans to continue stakeholder discussions regarding design of a financial penalty or similar recourse for failing the resource sufficiency evaluation in a separate stakeholder process starting soon. This recourse could be in the form of a capacity payment outside of the market from a balancing authority area that fails the resource sufficiency evaluation to the balancing authority area or areas that are the source of the transfers. The CAISO would seek to implement any proposed changes resulting from these discussions later in summer 2021 if feasible and appropriate.

Additional detail on how the bid range capacity test is applied to the CAISO balancing authority area can be found in the Appendix.

Proposal

The CAISO proposes to enhance the resource sufficiency evaluation by making the following changes to its bid range capacity test that will:

- Account for resource derates and rerates.
- Ensure imports represented through mirror resources are not double counted.
- Include load uncertainty within each balancing authority area's bid range capacity requirement.

Accounting for resource's derates will better reflect expected capacity the CAISO balancing authority area has available. Not double counting mirror system resources will ensure that the import capacity available to the CAISO balancing authority area in the resource sufficiency evaluation is accurate. Corrections of these identified software defects will ensure the resource sufficiency evaluation is applied consistent with the CAISO tariff.

Net load uncertainty is currently part of the CAISO market's calculation of the quantity of flexible ramping product to procure. Uncertainty is defined as each balancing authority area's calculated flexible ramping requirement minus the diversity benefit created by EIM participation. The quantity of flexible ramping product to procure for load uncertainty is determined using a histogram based on historic data that measures the error in the net load forecast during each 15-minute interval in the upcoming hour. With the implementation of the flexible ramping product refinements,¹⁶ the uncertainty calculation is being updated to be

¹⁶ CAISO Flexible Ramping Product Enhancements stakeholder initiative.
<https://stakeholdercenter.caiso.com/StakeholderInitiatives/Flexible-ramping-product-refinements>

estimated by a quantile regression that considers expected forecast of loads and variable energy resources.

The inclusion of uncertainty within the bid range capacity test is reasonable to prevent a balancing authority area inadvertently leaning on the EIM to address its uncertainty. The uncertainty requirement will be added to the existing bid range capacity test requirements. The CAISO recognizes that its inclusion raises the requirements for a balancing authority area to pass the test. Nonetheless, this change is appropriate given that each balancing authority is ultimately responsible for meeting its load, including the uncertainty in its net load. The inclusion of the uncertainty requirement within the bid range capacity test does not remove the economic decision to procure uncertainty on a demand curve. An EIM entity accessing EIM supply without procuring their uncertainty requirement effectively leans on the EIM to the extent that the EIM has lower priced supply than the procurement targets specified in the demand curve. Including uncertainty in the capacity test eliminates this opportunity for leaning.

As part of this initiative's straw proposal, the CAISO proposed the principle of not including any capacity in the bid range capacity test that would not be operationally available within the time horizon of the test. While on its surface this principle appears straightforward, its application is significantly nuanced. Appropriately applying this principle would have to address cold and warm startup times for offline resources, cycling resources whose start-up and minimum run times exceed the current CAISO real-time market optimization horizon, as well as offline resources that have received an advisory startup instruction. Further consideration would have to be given to resources whose offline status or existing multi-state generator configuration was based on an economic decision previously made by the EIM optimization. Given these complexities, the CAISO does not believe this principle is implementable by the summer of 2021, but plans to further discuss this principle in a future initiative.

In addition to the changes identified above, the CAISO is also proposing the following changes to improve EIM entity coordination, based on lessons learned from the events of last summer:

- Retain the last solved advisory real-time dispatch (RTD) results as a basis to set transfers should an EIM entity run out of advisory RTD intervals while in contingency operation.
- Update mirror system resources to have auto-mirroring enabled for transactions between the CAISO and the other EIM balancing authority areas.¹⁷

¹⁷ The EIM auto-match functionality automatically matches an EIM entity's intertie schedule change outside the market clearing of the real-time market because of changes to interchange e-tags at designated EIM interties or scheduling points with matching changes to an associated EIM non-participating resource EIM base schedule.

- Revise the penalty price parameters associated with the adjustment of EIM energy transfers submitted as base schedules (i.e., “Base ETSRs” and intertie schedules).

While in contingency operations, the net transfers into the contingency balancing authority area will no longer be optimized by the real-time market. RTD will continue to optimize only the internal participating resources of the EIM balancing authority area. The net EIM transfers into the balancing authority area are instead set during each RTD run, to the results of the advisory RTD solution prior to the balancing authority area entering into contingency operations. Should the contingency operation extend beyond the advisory horizon of the last pre-contingency RTD run, the net EIM transfers will default to 0 MW. This can result in large area control error (ACE) deviations, which can in turn lead to potential reliability risk to the balancing authority area.

The auto-mirror feature facilitates the mirroring of intertie schedules with the CAISO balancing authority area at CAISO intertie scheduling points from system resources in an EIM balancing authority area. Enabling the auto-mirroring functionality is appropriate as it removes manual action undertaken by the EIM entity to update their system resources to reflect intertie awards at CAISO scheduling points. This requirement will apply to cleared interchange transactions between the CAISO and the EIM entity scheduling coordinator.

During the events of September 6, the CAISO experienced high levels of north-to-south congestion that resulted in unintended interactions between the real-time market’s power balance constraint slack variable, loss penalty factors, and constraint shift factors. A condition arose where a mirror resource’s locational marginal price exceeded the export protection penalty price. As a result, a mirror resource with Arizona Public Service was cut to 0 MW as part of the optimal solution. Effectively, an adjustment to an intertie schedule was determined to be the optimal solution prior to the relaxation of a congestion-based constraint modeled within the CAISO balancing authority area. To prevent this from occurring again, the CAISO is proposing to review and make changes to ensure penalty prices are set to appropriate values relative to each other such that base transfer schedules (base ETSRs) and EIM interchange schedules are not subject to economic adjustment due to congestion within another balancing authority area.

Market Incentives for Imports during Tight System Conditions

Issues

The CAISO’s current import settlement rules may at times create disincentives for suppliers to offer hourly block economic import supply to the CAISO real-time market. The CAISO’s real-time market clears hourly block economic import bids based on prices from the hour-ahead scheduling process (HASP). However, the CAISO settles these offers at fifteen-minute market

(FMM) prices. Because the CAISO market does not provide any sort of make-whole payment to hourly block economic imports, suppliers can be at risk of being paid less than their bid price.

This may be a marginal disincentive for suppliers to offer imports to the real-time market. The risk of being paid less than bid price can be especially acute during stressed system conditions. This is a concern because the Final Root Cause Analysis pointed out during the summer events the CAISO balancing authority area needed energy in excess of its resource adequacy capacity. During tight system conditions, CAISO system operators take out-of-market measures to ensure reliability. These measures include upward adjustments to the load forecast in HASP and making out-of-market import purchases. These measures tend to suppress FMM prices relative to HASP prices.

For example, on August 16, the CAISO made out-of-market purchases of imported energy and encouraged additional import bids. The HASP price for hour ending 19 used to clear hourly block import bids at the NOB intertie was \$262. However, the FMM prices used to settle the imports averaged -\$149. The negative FMM prices resulted from the out-of-market purchases creating congestion in the FMM, which was not reflected in HASP. Consequently, suppliers were actually charged to deliver needed imports.

In the DMM's Q3 2020 Report on Market Issues and Performance, they analyzed the compensation of hourly block economic imports after the August 2020 events. Their analysis calculated hourly block economic imports' revenues compensation at FMM prices compared to their compensation at HASP prices. They found that although on net, of the hours analyzed, FMM revenues exceeded potential revenues at HASP prices, even though HASP prices were higher than FMM prices in some hours during this period. Therefore, they suggested a bid cost recovery or pay-as-bid option could be warranted during high demand hours.¹⁸

Proposal

The CAISO believes that under normal operating conditions it continues to be appropriate to clear hourly block imports and exports in the HASP and settle them at FMM prices without provisions for a make-whole payment to bid price.¹⁹ However, as outlined above, during very tight system conditions, the benefits of provisions for an import bid make-whole payment likely exceed the drawbacks. Consequently, the CAISO proposes provisions for bid cost make-whole payments for real-time market hourly block economic imports during tight system conditions.

¹⁸ The Department of Market Monitor Q3 2020 Report on Market Issues and Performance, Special Issues, page 114. <http://www.caiso.com/Documents/2020ThirdQuarterReportonMarketIssuesandPerformance-Feb4-2021.pdf>

¹⁹ The CAISO's Order 764 stakeholder process discusses further the reasons the market currently does not pay or guarantee the HASP price. http://www.caiso.com/Documents/Nov26_2013_TariffAmendment-Real-TimeMarketDesignEnhancementsRelated-Order764_ER14-480.pdf

The CAISO proposes that the imports eligible for a bid make-whole payment include:

- Real-time market import amounts that are incremental to any import amount scheduled in the day-ahead market.
- Real-time market import amounts that are the result of an export scheduled in the day-ahead market and reduced by the real-time market.

Under this proposal, the CAISO will calculate an hourly make-whole payment as the positive difference between a scheduling coordinator's bid price and the hourly average FMM locational marginal price for each of the applicable hours in which the CAISO identifies tight system conditions will exist.

The CAISO proposes to define tight system conditions as hours for which:

- The CAISO issues an alert notice by 3p.m. the day before an operating day that states the CAISO anticipates an operating reserve deficiency for specified hours, or
- The CAISO issues a warning notice or emergency notice during an operating day that states the CAISO anticipates or is experiencing an operating reserve deficiency during specified hours.²⁰

For example, on August 13, 2020 there was an alert notice issued for hours 1700-2100 on August 14, 2020. In the real-time on August 14, 2020, the CAISO issued a warning notice for hours 1200-2359, as well as Stage 2 and Stage 3 emergencies for hours 1520-2100 and 1836-2038 respectively.²¹ The CAISO's proposal to apply the make-whole payment settlement rule to hourly block economic imports would have applied to hours 1200-2359 on August 14, 2020.

Alternatively, on August 18, 2020 there was an alert notice issued for hours 1700-2000 on August 19, 2020. In the real-time on August 19, 2020, the CAISO did not issue a warning notice nor an emergency notice.²² The CAISO's proposal to apply the make-whole payment settlement rule to hourly block economic imports would have applied to hours 1700-2000 on August 19, 2020.

Imports that are not delivered and are subject to charges under the inertia deviation settlement rules will not be eligible for a make-whole payment. Additionally, imports that have

²⁰ More information on the definition of the alert, warning, and emergency operational notifications can be found at <http://www.caiso.com/Documents/SystemAlertsWarningsandEmergenciesFactSheet.pdf>

²¹ More information on the alerts, warnings, and emergencies issued for 2020 can be found at <http://www.caiso.com/Documents/AWE-Grid-History-Report-1998-Present.pdf#search=stage%201>

²² More information on the alerts, warnings, and emergencies issued for 2020 can be found at <http://www.caiso.com/Documents/AWE-Grid-History-Report-1998-Present.pdf#search=stage%201>

their settlement prices adjusted under the HASP reversal rule for not submitting an e-tag will not be eligible for a make-whole payment.²³

The examples below illustrate the CAISO's proposed approach for providing bid cost make-whole payments for real-time market hourly block economic imports during tight system conditions.

Example A:

Assume tight system conditions based on the criteria described and assume the following:

- A supplier submits an import bid priced at \$100/MWh for 0-50 MW, and \$150/MWh for 50-100 MW.
- HASP prices on the applicable intertie are greater than the import bid price and HASP schedules a 100 MW import based on the import bid.
- FMM prices decrease relative to HASP prices and average \$90/MWh for the four FMM intervals in the hour.
- The CAISO market would calculate the make-whole payment as:
 - $50 \text{ MW} * (\$100 - \$90/\text{MWh}) + 50 \text{ MW} * (\$150 - \$90/\text{MWh}) = \$3,500$, which equates to \$35/MWh

Example B:

Assume tight system conditions have been identified based on the criteria and assume the following:

- A supplier with 100 MW export scheduled in the day-ahead market rebids the export in the real-time market at \$100/MWh.
- HASP prices on the applicable intertie are greater than the export bid price and HASP reduces the export schedule to 0 MW, making it effectively a 100 MW real-time market import.
- FMM prices decrease to an average of \$90/MWh for the four FMM intervals in the hour.
- The CAISO market would calculate the make-whole payment as:
 - $100 \text{ MW} * (\$100 - \$90/\text{MWh}) = \$1,000$, which equates to \$10/MWh.

In the past, there has been concern about make-whole payments because of the potential for overlapping import and export bids from the same scheduling coordinator with an accompanying make-whole payment for the import. The concern is that the settlement of an

²³ The following CAISO Tariff sections outline the intertie deviation settlement and HASP reversal rules: 11.31 - Under/Over Delivery Charge for Deviations from Intertie Awards and 11.32 - Measures to Address Intertie Scheduling Practices.

overlapping import and export could net to zero yet the scheduling coordinator receives an accompanying make-whole payment for the import while delivering zero net incremental energy to the CAISO.

However, the CAISO believes the risk of this scenario occurring is minimal because of the limited periods of time that the make-whole provisions will apply. In addition, export bids are unlikely to clear in the real-time market during tight system conditions. Real-time market economic export bids have a lower priority than CAISO load and it is unlikely they will clear when CAISO issues notices signaling the need for more supply. Additionally, the CAISO plans to monitor bidding activity associated with the periods in which the make-whole payment rule is in effect. The CAISO proposes that it have the authority to suspend the make-whole payment provisions if there are adverse market outcomes resulting from the rule.

The CAISO proposes to allocate uplift costs from the make-whole payments to CAISO measured demand (CAISO balancing authority area metered demand and exports).

In response to the CAISO's straw proposal for this initiative, a number of stakeholders suggested various import settlement methodologies that were based on HASP prices. The CAISO determined that any option using HASP prices is infeasible to implement by summer 2021, as it would require extensive system and process changes. The CAISO plans to explore further pricing enhancements in the scarcity pricing initiative planned for later this year. Potential options could include settlement at HASP prices during system emergencies or development of an hour-ahead market run.

Real-time Scarcity Price Enhancements

Issue

Current practices may lower energy prices during tight supply conditions

When the CAISO meets its real-time demand requirement with generation it had originally reserved to meet its contingency reserve requirements, the market may produce lower energy prices at a time when it should be signaling very tight supply conditions with high prices.

When the CAISO is in a Stage 2 energy emergency, it is allowed to use generators providing contingency reserves to serve demand and meet its contingency reserve requirement by arming load. CAISO generally enters into a Stage 2 energy emergency with the intent to begin "arming load" to meet reserve requirements. Once in a Stage 2 energy emergency, CAISO operators begin "arming load." "Arming load" is a process where CAISO system operators inform load-serving entities to make all preparations necessary to be able to drop load in a controlled manner if a generation contingency were to occur. The load-serving entities inform the CAISO system operators of how much load they are able to arm and works with the CAISO

system operators to determine an appropriate quantity. CAISO system operators then use the market software to release the contingency reserves for use as energy.

After the CAISO system operators perform these actions, the market software uses the underlying resource energy bids to clear demand. This additional supply at bid cost may decrease prices during a time when real-time prices should increase to reflect the very tight supply conditions.

Proposal

When arming load to meet contingency reserve requirements, the CAISO proposes to release both contingent and non-contingent operating reserves at the bid cap price rather than at bid cost. This will set prices at the offer cap when there is insufficient generation supply to meet both energy and contingency reserve requirements. This pricing policy should attract more supply to the market and this pricing outcome will appropriately signal the tight supply condition.

The CAISO will price the released reserves at the bid-cap price that is applicable at that time. For instance, during the bid-cap pricing now applicable, the released reserves will have a \$1,000/MWh bid. Once CAISO's proposed policies from its FERC Order 831 – Import Bidding and Market Parameters initiative²⁴ are effective, the released reserves will have an energy bid price of \$2,000/MWh when (1) there is a submitted and cost-verified energy bid from a resource-specific resource greater than \$1,000/MWh or (2) a CAISO-calculated “maximum import bid price,” used to screen the costs of imports, is greater than \$1,000/MWh.

The \$1,000/MWh or \$2,000/MWh released reserve energy bids will set market prices only when the market clears those bids in merit-order, i.e., after exhausting any other available cheaper supply.

The CAISO no longer proposes to scale real-time penalty prices to \$2,000/MWh during tight supply conditions. In the previous draft of this proposal, the CAISO proposed to scale real-time penalty prices relative to a \$2,000/MWh power balance constraint penalty price when the day-ahead market cleared above \$800/MWh or operators issue alerts or warnings. This policy would have complex market interactions that the CAISO should take more time to consider.

²⁴ CAISO FERC Order 831 – Import Bidding and Market Parameters stakeholder initiative.
<https://stakeholdercenter.caiso.com/StakeholderInitiatives/FERC-Order-831-Import-bidding-and-market-parameters>

Reliability Demand Response Dispatch and Real-time Price Impacts

Issues

Reliability Demand Response Resources (RDRRs) are intended to be used immediately prior to or during emergency conditions, at the discretion of CAISO system operators.²⁵ The CAISO system operators have the ability either to enable RDRR for optimal dispatch within the market, or to manually dispatch RDRR. As currently implemented, RDRR resources are either unable to or inefficient in setting market prices. When manually dispatched, RDRRs do not set the marginal energy price. When manually dispatched out of merit, its reduction in load can suppress prices, which in turn may result in fewer economic imports clearing into the CAISO. RDRRs are currently only dispatched in RTD, whose advisory horizon extends approximately 65 minutes. RDRRs are allowed a maximum of a 40-minute startup time and a maximum of a 1-hour minimum run time. When only considered in RTD, the startup and minimum run time often extends beyond the optimization horizon, leading to the potential for inefficient market dispatch.

As identified in the Final Root Cause Analysis, RDRRs were manually dispatched by CAISO system operators on August 14 and 15. The reason RDRRs are dispatched manually rather than through the market is driven by two separate issues with how reliability demand response is implemented.

RDRRs are modeled and dispatched as a generating resource within the CAISO's market. However, their production is reflected as less load. To ensure the impact of RDRRs are preserved, its dispatch operating target (DOT) needs to count as an addition to the load forecast used by the real-time market. If it is not accounted for, then the market optimization will see less load, and respond by clearing less imports or reducing output of physical resources on the system. Accounting for RDRR production in the real-time market load forecast is currently a manual process performed by CAISO system operators. As currently implemented, the CAISO has hundreds of individual resources associated to RDRR programs. Allowing the market to optimally dispatch RDRRs would result in system operators having to coordinate the load forecast adjustments based on the dispatch of hundreds of resources during a system emergency. RDRR resources are often manually dispatched due to the difficulty associated with this task.

RDRRs typically have a maximum run time of four hours, with some allowing multiple starts within a day for a total daily run time of five hours. Given their limited use, CAISO system

²⁵ California Public Utilities Commission. Decision 10-06-034. June 24, 2010. https://docs.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/119815.htm

operators prefer to ensure that RDRRs are dispatched at a time when their four-hour maximum run time and subsequent return to normal load levels does not inadvertently add load during system conditions that are similar to or worse than when they were originally dispatched. For example, RDRRs dispatched optimally by the market at 3PM could return to normal load levels at 7PM near the net load peak. For this reason, CAISO system operators tightly control through manual dispatch when these resources are utilized during an emergency event.

Proposal and Rationale

The CAISO is proposing to dispatch RDRRs in real-time pre dispatch (RTPD) so they can be optimally dispatched within a longer horizon. Ensuring that the optimization horizon at a minimum captures the RDRR startup and maximum minimum run times will increase the efficiency of the market dispatch.

The CAISO is also proposing to allow RDRRs to register as 5-, 15-, or 60-minute dispatchable to better reflect their resource's parameters. For resources registered as 15-minute dispatchable, the CAISO is proposing they be allowed to set the marginal energy price in the fifteen-minute market whether they are registered as continuous or discrete. Resources registered as 5-minute dispatchable will be able to set the marginal energy price in RTD. This change is accomplished by reflecting discrete resources as discrete in the scheduling run, but treating them as continuous in the pricing run. RDRRs registered as 60-minute dispatch that clear in HASP will receive a fifteen-minute market schedule and will settle at the corresponding locational marginal price during each fifteen-minute market interval. This is consistent with how all hourly block energy resources are currently treated within the CAISO markets. These changes will allow the price signals created by the market to better reflect the operational value of RDRRs. Allowing the market to optimally dispatch RDRRs when prices indicate that they are needed will remove the price suppression effect created by their out-of-merit manual dispatch, which in turn will allow more economic imports to clear. Furthermore, allowing the market to dispatch RDRRs when the expected price in HASP or the price in the FMM exceeds 95% of the soft bid cap will ensure conventional resources and proxy demand response (PDR) resources are utilized prior to this emergency product when it is economic to do so.

The CAISO is also proposing to update its systems to account for RDRRs within its load forecast, removing the need for manual load forecast adjustments by CAISO system operators. This will be accomplished by adding the dispatched RDRR quantity to the load forecast for future intervals for the duration of time RDRRs are dispatched.

Management of Storage Resources during Tight System Conditions

The CAISO anticipates that about 1,800 MW of storage will be available for dispatch on its system by summer 2021. This is a significant increase from the current 550 MW of storage

available for dispatch and the roughly 200 MW of storage available during summer 2020. Nearly all of this new capacity is a result of an authorization of 3,300 MW new resource adequacy capacity by the California Public Utilities Commission (CPUC). The CPUC authorized this procurement over a three-year period with new capacity coming online beginning in 2021. Nearly all of the 3,300 MW of new procurement is 4-hour duration lithium-ion batteries and many of these storage devices will be located at new or existing solar facilities. Integrating these new resources will require updates to existing tools and development of new tools to ensure that the CAISO is able to effectively dispatch, optimize, and manage these resources.

Storage resources are fundamentally different from traditional gas resources in that they are unable to generate energy but instead store energy and move it from one time of the day to another. This works well in the CAISO system where energy tends to be abundant during the middle part of the day when solar is available but stretched thin during evening peak periods when renewables contribute very little and load is high. In previous stakeholder initiatives, the CAISO developed a model for storage resources that allows tracking of state of charge and positive (discharge) and negative (charge) dispatch instructions. In the fourth energy storage and distributed energy resource (ESDER 4) initiative, the CAISO developed policy to apply market power mitigation to storage resources and allowed scheduling coordinators to submit target end-of-hour state of charge thresholds for inclusion in the real-time market. The CAISO has scheduled development for these changes for the fall 2021 software release.²⁶

The CAISO is not proposing any new policy related to storage resources in this initiative. Instead, this initiative serves as a place to broadcast a complete picture of ongoing work to prepare the system for the new storage resources expected this summer. These changes include introduction of the minimum state of charge (MSOC) requirement, updates to the requirements for resources shown for regulation up and regulation down, and new tools for CAISO system operators to help manage storage resources. These changes are discussed in detail in the subsections below.

Minimum State of Charge

The CAISO proposes the minimum state of charge requirement as a component of the Resource Adequacy Enhancements (RAE) initiative.²⁷ This policy includes provisions to ensure that in the real-time market, storage resources are charged to a level that will ensure enough ability to deliver day-ahead discharge awards. This is critical for the CAISO because there is otherwise no

²⁶ CAISO Energy Storage and Distributed Energy Resources Phase 4 stakeholder initiative. <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Energy-storage-and-distributed-energy-resources>.

²⁷ CAISO Resource Adequacy Enhancements stakeholder initiative. <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Resource-adequacy-enhancements>.

mechanism to ensure that this energy is available in the real-time market and the energy may be critical to meeting peak net load periods.

The storage community expressed concern about the minimum state of charge requirement, and asked that the CAISO impose the requirement in a way to minimally impact the number of hours that the requirement would bind, and thus have a smaller impact on the ability for storage resources to participate in the real-time market. They also requested that the constraint be imposed on a limited number of days, again to reduce the overall impact that the requirement might have on a storage resource's ability to participate in the real-time market. Finally, the storage community requested that the CAISO develop a compensation mechanism for storage resources that are charged and held at a specific state of charge in the real-time market.

The CAISO is only proposing the minimum state of charge as a stopgap tool for storage management for critical periods this summer and next summer, and is only requesting approval to use this tool for two years. Second, the CAISO agrees that this tool only be imposed on the most critical days, and that this would only be triggered on days when the residual unit commitment process results in an insufficiency during a specific hour. This occurred on 23 days in 2020 (a very hot year), but only once in 2019 and once in 2018. The CAISO cannot offer any additional market compensation to storage resources that may be subject to the minimum state of charge requirement. Generally, rules for compensation can be very complicated and there is insufficient time to evaluate such rules through a stakeholder process. However, the CAISO contends that only resource adequacy storage resources would be subject to the minimum charge requirement. The resource adequacy program is a voluntary program and storage resources may elect not to show capacity through this program. If a resource owner elects not to show a storage resource as resource adequacy capacity, then the CAISO will not impose this requirement on the resource.

The CAISO maintains that a long-term solution to ensure state of charge from the storage fleet in the real-time market is necessary. The CAISO also agrees that resources providing these products to the CAISO are valuable and should receive compensation. The CAISO is committed to beginning a new stakeholder initiative, shortly after the conclusion of the summer 2021 readiness initiative, to address this concern. The CAISO will work to implement a solution from this new initiative upon sunset of the minimum state of charge requirement.

Changes to Regulation Requirements

The CAISO tariff requires that all resources awarded regulation are able to respond quickly and accurately to automatic generator control (AGC) signals from the CAISO and respond to signals

consistently for the period corresponding to the award.²⁸ This implies that storage resources providing regulation must have sufficient energy (i.e., state of charge) to respond to automatic generator control signals, including periods when a storage resource receives regulation up or regulation down awards.

The CAISO is planning to enforce a requirement that storage resources hold enough state of charge so that they will be able to respond to regulation signals at the awarded level for 30 minutes in the real-time market. This implies that if a storage resource receives a 10 MW award for regulation up, they will have at least 5 MWh of state of charge. Similarly, if the storage resource receives a 10 MW award for regulation down, they will be required to hold no more state of charge than 5 MWh below their maximum state of charge.²⁹ The CAISO will complete these changes through the typical proposed revision requires (PRR) process, which includes input from the stakeholder community. The CAISO plans to open a proposed revision request to capture these changes shortly but has not begun this process yet.

Enhancements to Operator Tools

It is critical that operations has visibility into the state of the storage fleet and has the ability to dispatch the storage fleet to specific levels if needed. There are still relatively few storage resources on the grid, and the CAISO will continue improving and evolving the suite of tools available to system operators for managing these resources as more becomes available and the system operators gain experience with operating and dispatching storage as a significant part of the fleet.

Prior to summer 2021, the CAISO will develop a new screen for the operations team so that they can visualize a system summary of the storage fleet including details for each online storage resource including: current state of charge, site telemetry values, and maximum/minimum operating limits for these resources. Additionally, this screen will show capacity and state of charge aggregated for the storage fleet at the transmission level.

Today, CAISO system operators have no way to send a storage resource an exceptional dispatch instruction to hold or attain a specific state of charge. System operators must monitor storage resources in real time and may run the risk of issuing traditional exceptional dispatches, to provide a specific MW value to the grid, that are infeasible due to actual states of charge for a storage resource. The CAISO will develop an internal tool that will accept a specific threshold or target state of charge for storage resources from system operators and move those resources to a specific state of charge value. System operators will have the ability to specify hours in

²⁸ CAISO Tariff section 8.4.1.1 specifies requirements for regulation services.

²⁹ Actual state of charge values could be somewhat higher, considering a round trip efficiency less than 1.0.

which these specific limits are issued to storage resources. This tool will help CAISO system operators manage storage resources in the real-time market.

Other Items

New OASIS Report

In response to a stakeholder request, the CAISO will implement an enhancement to its Open Access Same-time Information System (OASIS) to calculate and publish gross import and export schedules by intertie for the CAISO balancing authority area. This OASIS enhancement will report the import and export schedule breakdown by intertie and by direction for the day-ahead and real-time markets. This will allow market participants to view and download this information in the same manner as the current OASIS report on EIM transfers by intertie.

Independent Study Interconnection Enhancements

Issue

The CAISO has three interconnection request processes for transmission-connected resources: the annual cluster study process, the fast track process, and the independent study process. The independent study process is designed for interconnection customers that need to come online more quickly than the cluster study process, but for resources larger than the 5 MW limit imposed by the fast track process. Currently, the CAISO is aware of two issues that may mitigate independent study interconnection customers' ability to create capacity that load-serving entities can procure this summer. First, the CAISO's behind-the-meter expansion process caps expansions to the lesser of 125 percent of the existing capacity or 100 MW. Second, the independent study process was designed to prevent "queue-jumping" for deliverability,³⁰ and as such, requires independent study interconnection customers to participate as "energy only" until they can participate in the next cluster deliverability assessment. As such, even if deliverability is available and unused, the CAISO cannot allocate it to independent study interconnection customers on a temporary basis.

Proposal

First, the CAISO proposes to remove the cap on behind-the-meter expansions. The vast majority of expansions today are battery additions on variable energy resources, which are less likely to present the issues the cap was designed for. Removing the cap will allow variable energy resources to hold excess energy when demand is low and then discharge that energy during the system peak.

³⁰ Deliverability means the ability to delivery energy to load during peak conditions. Deliverability generally is a fundamental requirement to provide resource adequacy capacity.

Second, the CAISO proposes to empower itself to award available interim deliverability on a temporary basis. This will allow load-serving entities to shore up portfolios in tight summer months and it will maximize use of available deliverability capacity. Independent study interconnection customers could avail themselves of the deliverability until the interconnection customer the delivery network upgrades were constructed for comes online, or until the independent study interconnection customer can participate in the next deliverability assessment, receive its own permanent allocation, and has its delivery network upgrades constructed. This will ensure independent study interconnection customers can use available deliverability if they come online quickly while preventing queue jumping for deliverability.

Changes to Resource Adequacy Availability Incentive Mechanism (RAAIM)

The Resource Adequacy Availability Incentive mechanism (RAAIM) defines a standard for evaluating the performance of resource adequacy resources and creates performance incentives and non-availability charges for resource adequacy resources. Based on stakeholder feedback, the CAISO considered several RAAIM changes to be implemented this summer.

These potential changes included:

- Changing the availability assessment hours to include weekends and holidays
- Increasing the RAAIM penalty
- Eliminating certain RAAIM exemptions (e.g., for resources < 1 MW)

However, the CAISO has decided not to pursue RAAIM changes this summer for three reasons. First, RAAIM was not identified as a contributing factor to the August outages in the Final Root Cause Analysis. Second, the proposed changes involved significant implementation complexity that the CAISO felt could be better prioritized on other issues. Finally, some stakeholders commented they opposed the proposed changes because RA contracting is already complete and the changes would be implemented in the middle of an RA operating year.

5. EIM Governing Body Role

This initiative proposes to change CAISO market rules in order to incent supply during shortages and otherwise support the reliability of the transmission system during summer 2021, while ensuring equitable market outcomes. Each of the six elements³¹ of this initiative is severable for decisional purposes, meaning that if Management does not receive approval to file that element, they would nevertheless plan to file the remaining elements assuming they are

³¹ Note that “Management of Storage Resources during Tight System Conditions” and “OASIS Report” are not included because they do not include a policy/tariff change in this initiative.

approved. Staff believes the role of the EIM Governing Body in the approval of these individual elements of the initiative should be as explained below.

By way of background, the Charter for EIM Governance provides that the “EIM Governing Body will have advisory authority over any other rules that govern participation in the ISO’s entire real-time market, including rules that specifically govern the real-time market or rules that generally apply to any participation in ISO markets.” A proposed change to the rules of the real-time market, or rules that apply to participation in the market generally, falls within the primary authority of the EIM Governing Body if at least one of two conditions is satisfied: either the proposed new rule is EIM-specific in the sense that it applies uniquely or differently in the balancing authority areas of EIM Entities, as opposed to a generally applicable rule or, when a proposed market rules are generally applicable, if “an issue that is specific to the EIM balancing authority areas is the primary driver for the proposed change.”

Staff applies these rules to the individual elements of this initiative as follows:

- 1) **Export, Load, and Wheeling Priorities** would modify the tariff rules about the relative priority in the real-time market between CAISO balancing authority area load, wheel through self-schedules, and exports that are backed by non-RA resources under contract to serve load outside the CAISO balancing authority area.

Proposed classification: This element would fall within the Governing Body’s advisory role because it would change generally applicable rules of the real-time market, and because the primary driver for this change is not an issue specific to EIM balancing authority areas. The proposed rules will affect participation in EIM by changing the rules governing use of CAISO transmission.

- 2) **EIM Coordination and EIM Resource Sufficiency Test Review** would modify the tariff rules governing the EIM resource sufficiency evaluation to better account for resource availability, uncertainty about load, and related technical changes to ensure the resource sufficiency evaluation functions appropriately.

Proposed classification: This element falls within the primary authority of the Governing Body because some of the proposed new resource sufficiency rules are EIM-specific.

- 3) **Market Incentives for Imports during Tight System Conditions** would change tariff rules regarding the settlement of imports into the CAISO balancing authority area.

Proposed classification: Because this would not change rules that apply to the entire real-time market, rules that impose conditions on participation in any market timeframe, or rules that apply to EIM balancing authority areas specifically or uniquely,

this element falls outside the Governing Body's advisory role. This element does not affect participation in EIM.

- 4) **Real-Time Scarcity Pricing Enhancements** would change tariff rules about pricing when the CAISO balancing authority area meets its real-time demand requirement with supply that it had initially designated to meet contingency reserve requirements. The operating reserves would be released at the bid cap rather than at bid cost.

Proposed classification: This element would fall within the Governing Body's advisory role because it would change generally applicable rules of the real-time market, and because the primary driver for this change is not an issue specific to EIM balancing authority areas.

- 5) **Reliability Demand Response Dispatch and Real-Time Price Impacts** would change tariff rules about the dispatch of resources designated as reliability demand response so that these resources are included in real-time pre-dispatch, which will account for their startup and minimum run times.

Proposed classification: Because this would not change rules that apply to the entire real-time market, rules that impose conditions on participation in any market timeframe, or rules that apply to EIM balancing authority areas specifically or uniquely, this element falls outside the Governing Body's advisory role. It affects only California emergency demand response programs as they relate to resource adequacy for California and how these resources are dispatched.

- 6) **Independent Study Interconnection Enhancements** would change tariff rules regarding the interconnection procedures of the CAISO balancing authority area.

Proposed classification: Because this would not change rules that apply to the entire real-time market, rules that impose conditions on participation in any market timeframe, or rules that apply to EIM balancing authority areas specifically or uniquely, this element falls outside the Governing Body's advisory role.

These proposed classifications reflect the current state of this initiative, which may change. The CAISO encourages stakeholder comments, particularly if there is disagreement with a proposed classification. Please include in your written comments a justification for the alternative classification that would be more appropriate.

6. Stakeholder Engagement, Implementation Plan & Next Steps

The detailed schedule for stakeholder engagement is provided below.

Table 3: Stakeholder engagement and implementation development plan

Date	Milestone
Comments due – Revised draft tariff language**	April 15, 2021
Market Surveillance Committee meeting**	April 16, 2021
Stakeholder meeting – Revised draft tariff language**	April 19, 2021
EIM Governing Body Meeting**	April 19, 2021
CAISO Board of Governors Meeting**	April 21, 2021
FERC Filing**	April 28, 2021
Implementation*	June 1, 2021
Implementation**	July 1, 2021

*EIM coordination/resource sufficiency evaluation review; market incentives for imports; real-time scarcity pricing enhancements; reliability demand response dispatch and real-time price impacts; and independent study interconnection enhancements.

**Export, load and wheeling priorities

Stakeholders are encouraged to participate in the public conference calls to review the final proposal and draft tariff language, and submit written comments on these two documents by dates shown in table above. Please submit comments using the comments templates linked on the initiative webpage.³²

³² CAISO Market Enhancement for Summer 2021 Readiness stakeholder initiative.

<https://stakeholdercenter.caiso.com/StakeholderInitiatives/Market-enhancements-for-summer-2021-readiness>

Appendices

Implications of Penalty Parameters on Wheels

Existing Transmission Contracts (ETCs) and Transmission Ownership Rights (TORs) have the highest scheduling priority in the scheduling runs, even above CAISO load. In determining the Maximum Import Capability (MIC) allocation, this import capability is reserved for ETC/TOR use and is not allocated to CAISO load-serving entities to be used for RA imports. In the Congestion Revenue Right (CRR) allocation, ETC/TOR import capability is not included in the transmission limits used in the simultaneous feasibility test. Since the CAISO considers ETCs/TORs in both the MIC process and CRR process, they have the highest scheduling priority, which will not change for summer 2021.

For summer 2021, the CAISO is addressing wheels that could crowd out RA imports because the wheels were not considered in either the MIC allocation or the CRR process. The CAISO is unable to implement changes for summer 2021 that would allocate import capability to these wheels. The use of penalty prices alone is insufficient to providing the correct scheduling priority between wheels and CAISO load. Therefore, a process is needed after the hour ahead scheduling process is completed to equitably determine scheduling priority.³³

The following sections discuss the penalty prices for the scheduling run in the integrated forward market, residual unit commitment process, and the hour ahead scheduling process. When the market evaluates priorities, it considers both the cost of demand not served and the supply not needed. These are simplified examples focusing on imports versus wheels using import capability and showing just the implication from the penalty prices alone by assuming no impact of losses or other congestion.³⁴ After reviewing implications from the penalty prices, the post-HASP process is discussed.

Integrated Forward Market

The list below describes the penalty prices in IFM for various types of self-schedules.

- The penalty price for self-scheduled load, PT exports, and the export leg of PT wheel is \$1450.
- The penalty price for the export leg of LPT wheel is \$1150.
- The penalty price for a self-scheduled import and import leg of PT wheel is (\$400).

³³ The numbers in these examples are just illustrative. The actual penalty prices may differ but the relative priorities are what matter.

³⁴ The examples are based on the set of penalty parameters pegged to a bid cap of \$1000. The CAISO has included the business practice manual changes as an additional appendix to show the penalty parameters based on \$1000 and \$2000 bid caps under FERC order 831.

- The penalty price the import leg of a LPT wheel is \$0.

When the market evaluates priorities, it considers both the cost of demand not served and the cost of supply not needed. For example, the cost of not serving self-scheduled load by a self-scheduled import is \$1450 – (\$400) = \$1850. If an import self-schedules and is needed to meet self-scheduled load, the cost of not meeting load is \$1850. The cost of not meeting the PT wheel is also \$1850. The cost of the LPT wheel is \$1150. The import and PT wheel will clear IFM and the LPT wheel will not.

If an import submits a bid below \$0/MWh (for example -\$5) and it is needed to meet self-scheduled load, the cost of not meeting load is \$1455. The cost of not meeting the PT wheel is \$1850. The cost of not meeting the LPT wheel is \$1150. The PT wheel will clear IFM before the import. The import will clear IFM before the LPT wheel.

If an import submits a bid above \$300/MWh (for example \$310) and it is needed to meet self-scheduled load, the cost of not meeting load is \$1140. The cost of not meeting the PT wheel is \$1450. The cost of not meeting the LPT wheel is \$1150. The PT wheel will clear IFM before the LPT wheel. The LPT wheel will clear IFM before the import.

Residual Unit Commitment

Note that RUC clears based upon RUC availability bids, which have an offer cap of \$250 for non-RA resources. Resource adequacy resources and designated supporting resources for PT exports effectively bid \$0/MWh for RUC availability covering the RA obligation or the PT export quantity. As will be illustrated below, an import providing resource adequacy may not receive a RUC schedule when RUC is unable to meet the CAISO load forecast. If this occurs, after the RUC optimization, all resource adequacy imports will receive a RUC schedule in order to create a real-time must-offer obligation to allow the RUC shortfall to be addressed in the real-time market.

The list below describes the penalty prices in RUC for various types of self-schedules.

- The penalty price for the CAISO load forecast, PT export, and the export leg of PT wheel from IFM is \$1600.
- The penalty price for the LPT export and the export leg of LPT wheel from IFM is \$1350.
- The penalty price for an economically bid export from IFM is the IFM bid price plus \$300.
- The penalty price for self-scheduled imports and import leg of a PT wheel from IFM is (\$650).
- The penalty price for import leg of LPT wheel from IFM is \$0.

- The penalty price for economically bid imports from IFM is the minimum (energy bid price -\$250, or \$0).
- RA imports must submit a RUC availability bid of \$0/MWh.

If an IFM-cleared non-RA import that self-scheduled in IFM is needed to meet the CAISO load forecast, the cost of not meeting load is \$2250. The cost of not meeting the PT wheel is \$1600. The cost of not meeting the LPT wheel is \$1350. The import or the PT wheel will clear RUC, but both will clear before an LPT wheel.

If an IFM-cleared non-RA import that had an economic bid in IFM (for example \$100) is needed to meet the CAISO load forecast, the cost of not meeting load is \$1750. The cost of not meeting the wheel is \$2250. The PT wheel will clear RUC before the import. The import will clear RUC before the LPT wheel.

If an IFM-cleared non-RA import that had an economic bid in IFM (for example \$500) is needed to meet the CAISO load forecast, the cost of not meeting load is \$1600. The cost of not meeting the PT wheel is \$2250. The cost of not meeting the LPT wheel is \$1350. The PT wheel will clear RUC before the import. The import will clear RUC before the LPT wheel.

If an RA import that did not clear IFM is needed to meet the CAISO load forecast, the cost of not meeting load is \$1600. The cost of not meeting the PT wheel is \$2250. The cost of not meeting the LPT is \$1350. The PT wheel will clear RUC before the import. The import will clear RUC before the LPT wheel.

Hour Ahead Scheduling Process

Since wheels are hourly block schedules, HASP determines the real-time schedules.

The list below describes the penalty prices in HASP for various types of self-schedules.

- The penalty price for RUC PT exports, RT PT exports, and the export leg of PT wheel is \$1450.
- The penalty price for the power balance constraint above 300MW of regulation is \$1450.
- The penalty price for RUC LPT exports and the export leg of RUC LPT wheel is \$1150.
- The penalty price for the power balance constraint between 0MW and 300MW of regulation is \$1100.
- The penalty price for RT LPT exports and the export leg of RT LPT wheel is \$1050.
- The penalty price for a RUC self-schedule import and the import leg of RUC PT wheel (\$750).

- The penalty price for a real-time self-schedule import and real-time import leg PT wheel is (\$400).
- The penalty price for the import leg of an LPT wheel is \$0.

If a RUC import self-schedule is needed to meet the CAISO load forecast, the cost of not meeting load is \$2200. The cost of the RUC PT wheel is \$2200. The cost of not meeting the real-time PT wheel is \$1850. The cost of not meeting a RUC LPT wheel is \$1150. The cost of not meeting a real-time LPT wheel is \$1050. The load and RUC PT wheel will clear HASP before a real-time PT wheel. The real-time PT wheel will clear HASP before a RUC LPT wheel. The RUC LPT wheel will clear HASP before a real-time LPT wheel.

If a real-time import self-schedule is needed to meet the CAISO load forecast, the cost of not meeting load is \$1850. The cost of not meeting the RUC wheel is \$2200. The cost of not meeting a real-time PT wheel is \$1850. The cost of not meeting a RUC LPT wheel \$1150. The cost of not meeting a real-time LPT wheel is \$1050. The RUC wheels will clear HASP before load and real-time PT wheels. Load and real-time PT wheels clear HASP before RUC LPT wheels. RUC LPT wheels will clear HASP before real-time LPT wheels.

If a real-time import that economically bids less than \$300/MWh (such as \$200) is needed to meet the CAISO load forecast, the cost of not meeting load is \$1250. The cost of not meeting the RUC PT wheel is \$2200. The cost of not meeting a real-time PT wheel is \$1850. The cost of not meeting the RUC LPT wheel is \$1150. The cost of not meeting the real-time LPT wheel is \$1050. The RUC or RT wheel will be served before CAISO load. The RUC wheels will clear HASP before real-time PT wheels. Real-time PT wheels will clear HASP before load. Load will clear HASP before RUC LPT wheels. RUC LPT wheels will clear HASP before real-time LPT wheels.

If a real-time import that economically bids between \$300/MWh and \$400 (such as \$350) is needed to meet the CAISO load forecast, the cost of not meeting load is \$1100. The cost of not meeting the RUC PT wheel is \$2200. The cost of not meeting a real-time PT wheel is \$1850. The cost of not meeting the RUC LPT wheel is \$1150. The cost of not meeting the real-time LPT wheel is \$1050. The RUC wheels will clear HASP before real-time PT wheels. Real-time PT wheels will clear HASP before RUC LPT wheels. RUC LPT wheels will clear HASP before load. Load will clear HASP before real-time LPT wheels.

If a real-time import that economically bids greater than \$400/MWh (such as \$500) is needed to meet the CAISO load forecast, the cost of not meeting load is \$950. The cost of not meeting the RUC PT wheel is \$2200. The cost of not meeting a real-time PT wheel is \$1850. The cost of not meeting the RUC LPT wheel is \$1150. The cost of not meeting the real-time LPT wheel is \$1050. The RUC wheels will clear HASP before real-time PT wheels. Real-time PT wheels will

clear HASP before RUC LPT wheels. RUC LPT wheels will clear HASP before real-time LPT wheels. Real-time LPT wheels will clear HASP before load.

Administrative Process after HASP

The CAISO will apply a pro rata allocation method for allocating transmission capacity among ~~import RUC self-schedules~~, RA import bids³⁵ or self-schedules, and high priority wheeling self-schedules on an intertie that is constrained in the import direction by a scheduling limit, when the HASP optimal solution shows uneconomic adjustments among said schedules and/or load. The CAISO will also apply a similar pro rata allocation method for allocating southbound transmission capacity on Path 26, among ~~RUC self-schedules~~, RA import bids or self-schedules, and high priority wheeling self-schedules when Path 26 is constrained in the north-south direction, and when the HASP optimal solution shows uneconomic adjustments among said schedules and/or load. The additional imports and internal generation that did not clear HASP will be scheduled in merit order. If the HASP solution shows uneconomic adjustments and an intertie is binding, in the event a low priority wheel was scheduled in HASP, its schedule will be reduced to 0 MW in the administrative process.

The following examples demonstrate how the import capability is distributed between RA imports and PT wheels.

Example 1

Example 1 shows that the share of the import capability is divided pro rata between RA imports and PT wheels at the intertie scheduling point. **PT Wheel requested 45 days in advance for 200 MWs.**

Import limit: 300MW

Total RA Import Bids: 150MW

DA PT Wheel: 200 MW (assume 100 % scheduled in the day-ahead market)

RT Wheel: 200MW

PT Wheel eligible in pro-rata process: minimum (RT PT Wheel, 110* DA PT Wheel, 45 day PT wheel quantity) = min (200 MW, 220 MW, 200 MW) = 200 MW

HASP Solution, but is uneconomic: Import: 100MW, PT Wheel: 200 MW

³⁵ RA import bids include self-schedules of day-ahead awards and incremental bids above the day-ahead schedules. The RA imports bid can include both RUC awards that have a real-time must offer obligation and incremental bid voluntarily submitted in the real-time market.

Total Import MW = RA imports = 150MW

Pro rata allocation of 300MW will distribute between the import and PT wheel

Import allocation = $300 * [150 / (200 + 150)] = 128.5$ MW

PT Wheel allocation = $300 - \text{Import allocation} = 300 - 128.5 = 171.4$ MW

Example 1.1

Example 1.1 shows that the share of the import capability is divided pro rata between RA imports and PT wheels at the intertie scheduling point. **PT Wheel shown 45 days in advance for 200 MWs.**

Import limit: 300MW

Total RA Import Bids: 150MW

DA PT Wheel: 180MW (assume at least 90 % scheduled in the day-ahead market)

RT Wheel: 200MW

PT Wheel eligible in pro-rata process: minimum (RT PT Wheel, 110* DA PT Wheel, 45 day PT Wheel quantity) = min (200MW, 198 MW, 200 MW) = 198 MW

HASP Solution, but is uneconomic: Import: 100MW, PT Wheel: **198 MW**

Total Import MW = RA imports = 150MW

Pro rata allocation of 300MW will distribute between the import and PT wheel

Import allocation = $300 * [150 / (198 + 150)] = 129.3$ MW

PT Wheel allocation = $300 - \text{Import allocation} = 300 - 129.3 = 170.7$ MW

Example 1.2

Example 1 shows that the share of the import capability is divided pro rata between RA imports and PT wheels at the intertie scheduling point when PT Wheel schedules less than 95 percent in DA. PT Wheel shown 45 days in advance for 200 MWs.

Import limit: 300MW

Total RA Import Bids: 150MW

DA PT Wheel: 100 MW (assume 50 percent scheduled in DA)

RT PT Wheel: 200 MW

PT Wheel eligible in pro-rata process: minimum (200 MW, 110 MW, 200 MW) = 110 MW

HASP Solution, but is uneconomic: Import: 100MW, PT Wheel: 110 MW

Total Import MW = RA imports = 150MW

Pro rata allocation of 300MW will distribute between the import and PT wheel

Import allocation = $300 * [150 / (110 + 150)] = 173$ MW

PT Wheel allocation = $300 - \text{Import allocation} = 300 - 173 = 126$ MW

Example 2

~~Example 2 builds upon the previous example, but introduces total import RUC schedules to the determination of the CAISO share of the intertie scheduling point. Total import RUC schedules include both RA imports and non-RA imports that cleared the RUC optimization. The higher of the RUC import or RA imports determines the pro-rata share for CAISO.~~

~~Import limit: 250MW~~

~~Total Import RUC Schedule: 100MW~~

~~Total RA Import Bids: 90MW~~

~~PT Wheel: 200MW~~

~~HASP Solution, but is uneconomic: Import: 50MW, PT Wheel: 200 MW~~

~~Total Import MW = $\text{MAX}(90, 100) = 100$ MW~~

~~Pro-rata allocation of 250MW will distribute between the import and PT wheel~~

~~Import allocation = $250 * [100 / (200 + 100)] = 83$ MW~~

~~PT Wheel allocation = $250 - \text{Import allocation} = 250 - 83 = 167$ MW~~

Example 2

Example 2 builds upon the previous example 1s, but recognizes that CAISO's pro rata share should not exceed the import limit because the CAISO cannot access its full RA imports. This is

the proposed calculation of CAISO pro rata share of the import capability at the intertie scheduling point.

Import limit: 250MW

~~Total Import RUC Schedule: 100MW~~

Total RA Import Bids: 300 MW

PT Wheel: 200MW

HASP Solution, but is uneconomic: Import: 50MW, PT Wheel: 200 MW

Total Import MW = MIN(import limit, ~~Total RA Import Bids~~ ~~MAX(300,100)~~) = 250MW

Pro rata allocation of 250MW will distribute between the total import and PT wheel

Import allocation = $250 * [250 / (200 + 250)] = 139\text{MW}$

PT Wheel allocation = $250 - \text{Import allocation} = 250 - 139 = 111\text{MW}$

The administrative schedule adjustment process after HASP will also be applied for flowgate congestion, e.g., Path 26 north to south congestion, which results in uneconomic adjustments among generation/import schedules north of Path26 and high priority wheels southbound through Path26, and or under-generation power balance constraint relaxation because the load forecast south of Path 26 cannot be served. This administrative schedule adjustment for Path 26 north to south congestion is similar to the one applied for congested interties in the import direction if the problem is transformed as follows:

- The Import Limit is the Path26 north to south limit.
- The RA Bid/Self-Schedule is the sum of the RA bid capacity in HASP from all RA resources north of Path26 (generators, NGRs, and imports).
- The PT Wheel Self-Schedule is the sum of all PT Wheel Self-Schedules from wheels that cross Path26 in the north to south direction.
- The demand forecast of the PG&E TAC is subtracted from the RA Bid/Self-Schedule to yield the RA supply that competes with PT wheels for transmission capacity on Path26.

Overview of Operating Procedure when HASP is Infeasible

Although the HASP resulted in uneconomic adjustments, system operators will not automatically curtail PT wheel schedules, PT export schedules, and shed load. During the instruction review period, system operators will review the market results prior to releasing

curtailed PT wheel or PT export schedules. System operators can take actions to ensure load, PT wheel schedules and PT export schedules can be maintained. System operators will evaluate current load, forecasted load change for the HASP review hour, available generation capacity for the HASP review hour, import capability across interties and ability to meet contingency reserve obligations. If operators determine that PT wheel schedules and PT export schedules as submitted in HASP can be supported for that hour without firm load shed then schedules will be released regardless what was scheduled in HASP. For PT wheels, system operators will be provided with the PT wheel bid quantity, the HASP schedule and the post-HASP pro rata schedule. If system operators can take actions that enable the PT wheel to be supported, the PT wheel bid quantity will be released as the final schedule. If system operators have exhausted all actions and are unable to support the PT wheel, the post-HASP pro rata schedule will be released as the schedule. Any necessary actions to maintain reliability after this time will be performed by the system operators through emergency assistance.

Interaction between EIM Imports and the CAISO Capacity Requirement in the Bid Range Capacity Test

How EIM Transfers Impact Internal Resources

- When advisory EIM transfers into the CAISO balancing authority area (BAA) displace an internal resource, the CAISO's upward capacity requirement is increased. The CAISO's available bid range also increases because those same resources are still available.
- When advisory EIM transfers out of the CAISO BAA increases an internal resource's schedule, the CAISO's upward capacity requirement is decreased. Consequently, the CAISO's available bid range also decreases because those same resources are not available to meet CAISO load.

How EIM Transfers Impact Imports/Exports

- When advisory EIM transfers into the CAISO BAA reduces an hourly block import that cleared RUC, the CAISO's requirement increases by the displaced hourly block import. However, the CAISO is unable to count the cleared hourly block schedule toward the requirement. Consequently, no additional capacity is freed up to meet the requirement.
- When advisory EIM transfers into the CAISO BAA are not economic, HASP may clear more hourly block imports above RUC schedules to serve CAISO. This will decrease the CAISO capacity requirement and preserve internal CAISO generation capacity to pass the requirement.
- When advisory EIM transfers into the CAISO BAA allow an hourly block export out of the CAISO, the CAISO's capacity requirement is increased. However, there is not additional internal generation available to meet the capacity requirement.

- When advisory EIM transfers into the CAISO BAA allow for an advisory EIM transfers out of the CAISO BAA, the CAISO’s capacity requirement is unchanged.
- When advisory EIM transfers out of the CAISO BAA are not economic, the CAISO will support exports, only to the extent possible by their internal resources. This increases the CAISO’s capacity requirement.
- When advisory EIM transfers out of the CAISO BAA increase an hourly block import that cleared RUC, the CAISO’s capacity requirement is unchanged.
- When advisory EIM transfers out of the CAISO BAA decrease an hourly block export that cleared RUC, the CAISO’s capacity requirement is reduced. The CAISO available bid range also increases because existing resources remain available.

Business Practice Manual Changes to Penalty Prices to Support FERC Order No. 831

Market Parameter Values

This section provides the specific value settings for a set of ISO market parameters that are used for adjusting non-priced quantities in the market optimizations.

The parameter values are organized into three sections by market process: the Integrated Forward Market (IFM), the Residual Unit Commitment (RUC), and the Real Time Market (RTM). The parameters in these tables are also known in the jargon of mathematical optimization as “penalty factors,” which are associated with constraints on the optimization and which govern the conditions under which constraints may be relaxed and the setting of market prices when any constraints are relaxed. Importantly, the magnitude of the penalty factor values in the tables for each market reflect the hierarchical priority order in which the associated constraint may be relaxed in that market by the market software.

Integrated Forward Market (IFM) Parameter Values

Penalty Price Description	Scheduling Run Value ³⁶ Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value ³⁷ Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
Market energy balance	4900	1000	9800	2000	Market energy balance is the requirement that total supply equal the sum of total demand plus losses for the entire system. In the IFM energy

³⁶ Penalty values are negatively valued for supply reduction and positively valued for demand reduction.

³⁷ Penalty values are negatively valued for supply reduction and positively valued for demand reduction.

Penalty Price Description	Scheduling Run Value ³⁶ Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value ³⁷ Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
					balance reflects the clearing of bid-in supply and demand; in the MPM component of the DAM it reflects the scheduling of bid-in supply against the ISO demand forecast.
Transmission constraints: Intertie scheduling	5000	1000	10000	2000	Intertie scheduling constraints limit the total amount of energy and ancillary service capacity that can be scheduled at each scheduling point.
Gas-burn nomogram	5000	1000	10000	2000	In the scheduling run, the market optimization enforces gas-burn constraints up to a point where the cost of enforcement (the "shadow price" of the constraint) reaches the parameter value, at which point the constraint is relaxed.
Legacy Reliability Must-Run (LRMR) pre-dispatch curtailment (supply)	-6000	-150	-12000	-150	The ISO considers transmission constraints when determining LRMR scheduling requirements. After the ISO has determined the LRMR scheduling requirements, the market optimization ensures that the designated capacity is scheduled in the market.
Pseudo-tie layoff energy	-4000	-150	-8000	-150	Pseudo-tie layoff energy is scheduled under contractual arrangements with the Balancing Authority in whose area a pseudo-tie generator is located.
Transmission constraints: branch, corridor, nomogram (base case and contingency analysis)	5000	1000	10000	2000	In the scheduling run, the market optimization enforces transmission constraints up to a point where the cost of enforcement (the "shadow price" of the constraint) reaches the parameter value, at which point the constraint is relaxed.

Penalty Price Description	Scheduling Run Value ³⁶ Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value ³⁷ Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
Generation nomogram	5000	1000	10,000	2000	In the scheduling run, the market optimization enforces generation constraints up to a point where the cost of enforcement (the "shadow price" of the constraint) reaches the parameter value, at which point the constraint is relaxed.
Transmission constraints: Transformer	5000	1000	10000	2000	In the scheduling run, the market optimization enforces transmission constraints up to a point where the cost of enforcement (the "shadow price" of the constraint) reaches the parameter value, at which point the constraint is relaxed.
Extremely Long Commitment	3750	1000	7500	2000	When a resource is committed through the extra-long commitment (ELC) process, or if a second or third day commitment occurs in the RUC process, that commitment is protect with a priority.
Load Serving Generator	-1800	-150	-3600	-150	Load Serving Generator for supply receive higher priority than Economic Bids at the bid floor.
RA Capacity	0	0	0	0	Priority for RA submitted into RUC
Transmission Ownership Right (TOR) self schedule	5900, -5900	1000, -150	11800, -11800	2000 or -150	A TOR Self-Schedule will be honored in the market scheduling in preference to enforcing transmission constraints.
Existing Transmission Contract (ETC) self schedule	5100 to 5900, -5100 to -5900	1000, -150	10200 to 11800, 10200 to 11800	2000, -150	An ETC Self-Schedule will be honored in the market scheduling in preference to enforcing transmission constraints. The typical value is set at \$5500, but different values from \$5100 to \$5900 are possible if the instructions to the ISO establish differential priorities among

Penalty Price Description	Scheduling Run Value ³⁶ Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value ³⁷ Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
					ETC rights. For some ETC rights the ISO may use values below the stated scheduling run range if that is required for consistency with the instructions provided to the ISO by the PTO.
Converted Right (CVR) self schedule	5500, -5500	1000, -150	11000, -11000	2000 or -150	A CVR Self-Schedule is assigned the same priority as the typical value for ETC Self-Schedules.
Ancillary Service Region Regulation-up and Regulation-down Minimum Requirements	2500	250	5000	250	In the event of bid insufficiency, AS minimum requirements will be met in preference to serving generic Self-Scheduled demand, but not at the cost of overloading transmission into AS regions.
Ancillary Service Region Spin Minimum Requirements	2250	249	4500	249	Spinning reserve minimum requirement is enforced with priority lower than regulation up minimum requirement in scheduling run.
Ancillary Service Region Non-Spin Minimum Requirements	2000	248	4000	248	Non-spin reserve minimum requirement is enforced with priority lower than spin minimum requirement in scheduling run.
Ancillary Service Region Maximum Limit on Upward Services	1500	250	3000	250	In the event of multiple AS regional requirements having bid insufficiency, it is undesirable to have multiple constraints produce AS prices equaling multiples of the AS bid cap. An alternative way to enforce sub-regional AS requirements is to enforce a maximum AS requirement on other AS regions, thereby reducing the AS prices in the other regions without causing excessive AS prices in the sub-region with bid insufficiency.

Penalty Price Description	Scheduling Run Value ³⁶ Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value ³⁷ Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
Energy Limit for daily constraint quantities	1500	250	3000	500	Energy limitation constraint used for total daily minimum or maximum limitation for quantities
Regulation Mileage UP and down minimum requirement	1000	1000	2000	2000	In the event of mileage bid insufficiency, mileage minimum requirements will be relaxed in preference to serving generic Self-Scheduled demand, but not at the cost of overloading transmission into AS regions.
Convergence bid nodal group constraints	750	750	1500	1500	Nodal group constraints used for DC to AC power flows convergence
Minimum Online Capacity (MOC) constraint	0	0	0	0	Minimum online capacity for reliability constraints
Self-scheduled CAISO demand and self-scheduled exports using identified non-RA supply resource	1800	1000	3600	2000	Pursuant to section 31.4, the uneconomic bid price for self-scheduled demand in the scheduling run exceeds the uneconomic bid price for self-scheduled supply and self-scheduled exports not using identified non-RA supply resources.
Self-scheduled exports not using identified non-RA supply resource	1050	1000	2100	2000	The scheduling parameter for self-scheduled exports not using identified non-RA capacity is set below the parameter for generic self-schedules for demand.
Regulatory Must-Run and Must Take supply curtailment	-1350	-150	-2700	-150	Regulatory must-run and must-take supply receive priority over generic self-schedules for supply resources.
Price-taker supply bids	-1100	-150	-2200	-150	Generic self-schedules for supply receive higher priority than Economic Bids at the bid floor.
Conditionally qualified Regulation Up or	-405	NA	-810	NA	Conversion of AS self-schedules to Energy pursuant to section 31.3.1.3 received higher priority to maintaining

Penalty Price Description	Scheduling Run Value ³⁶ Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value ³⁷ Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
Down self-provision					the availability of regulation, over spinning and non-spinning reserve.
Conditionally qualified Spin self-provision	-400	NA	-800	NA	Conversion of AS self-schedules to Energy pursuant to section 31.3.1.3 receives higher priority to maintaining the availability of spinning reserve, over non-spinning reserve.
Conditionally qualified Non-Spin self-provision	-395	NA	-790	NA	This penalty price for conversion of self-provided non-spinning reserves balances the maintenance of AS self-schedules with ensuring that the conversion to energy occurs before transmission constraints are relaxed.
Conditionally unqualified Reg Up or Down self-provision	-195	NA	-390	NA	In instances where AS self-provision is not qualified pursuant to the MRTU tariff, the capacity can still be considered as an AS bid, along with regular AS bids. The price used for considering unqualified AS self-provision is lower than the AS bid cap, to allow it to be considered as an Economic Bid.
Conditionally unqualified Spin self-provision	-170	NA	-340	NA	Same as above.
Conditionally unqualified Non-Spin self-provision	-155	NA	-310	NA	Same as above.

Residual Unit Commitment (RUC) Parameter Values

Penalty Price Description	Scheduling Run Value	Pricing Run Value	Comment
Transmission constraints: Intertie scheduling	1250	250	The Intertie scheduling constraint retains higher relative priority than other RUC constraints.
Market energy balance - under procurement	1600	250	The RUC procurement may be less than the Demand forecast if the CAISO has committed all available generation and accepted intertie bids up to the intertie capacity.
Transmission constraints: branch, corridor, nomogram (base case and contingency analysis)	1250	250	These constraints affect the final dispatch in the Real-Time Market, when conditions may differ from Day-Ahead.
Gas-burn nomogram	1250	250	In the scheduling run, the market optimization enforces gas-burn constraints up to a point where the cost of enforcement (the “shadow price” of the constraint) reaches the parameter value, at which point the constraint is relaxed.
Maximum energy limit in RUC schedule	1500	250	Limits the extent to which RUC can procure energy rather than unloaded capacity to meet the RUC target. For MRTU launch the limit will be set so that the total energy scheduled in the IFM and RUC will be no greater than 99% of the RUC target unless this limit is relaxed in the RUC scheduling run.
Limit on quick-start capacity scheduled in RUC	250	0	Limits the amount of quick-start capacity (resources that can be started up and on-line within 5 hours) that can be scheduled in RUC. For MRTU launch the limit will be set to 75%.
Day-Ahead energy schedules resulting from the IFM run	250	0	These values preserve schedules established in IFM in both the RUC scheduling run and pricing run.
Market energy balance - over procurement	200	0	Market energy balance when the RUC procurement may be more than the Demand forecast.
Export RUC priority adder	50	0	Export adder priority for IFM schedules
RA capacity	0	0	Priority for RA submitted into RUC

Real Time Market Parameters

Penalty Price Description	Scheduling Run Value Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
Energy balance/Load curtailment and Self-Scheduled exports utilizing non-RA capacity	1450	1000	2900	2000	Scheduling run penalty price is set high to achieve high priority in serving forecast load and exports that utilize non-RA capacity. Energy bid cap as pricing run parameter reflects energy supply shortage.
Transmission constraints: Intertie scheduling	1500	1000	3000	2000	The highest among all constraints in scheduling run, penalty price reflects its priority over load serving. Energy bid cap as pricing run parameter reflects energy supply shortage.
Gas-burn nomogram	1500	1000	3000	2000	Scheduling run penalty price will enforce gas-burn constraints up to a re-dispatch cost of \$1500 per MWh. Energy bid cap as pricing run parameter consistent with the value for energy balance relaxation under a global energy supply shortage
Legacy Reliability Must-Run (LRMR) pre-dispatch curtailment (supply)	-6000	-150	-12000	-150	The ISO considers transmission constraints when determining LRMR scheduling requirements. After the ISO has determined the LRMR scheduling requirements, the market optimization ensures that the designated capacity is scheduled in the market.
Pseudo-tie layoff energy	-1500	-150	-3000	-150	Energy bid floor is used as the pricing run parameter for any type of energy self-schedule.
Transmission constraints: branch, corridor, nomogram (base case and contingency analysis)	1500	1000	3000	2000	Scheduling run penalty price will enforce internal transmission constraints up to a re-dispatch cost of \$ of congestion relief in \$1500 per MWh. Energy bid cap as pricing run parameter consistent with the value for

Penalty Price Description	Scheduling Run Value Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
					energy balance relaxation under a global energy supply shortage.
Real Time TOR Supply Self Schedule	-5900	-150	-11800	-150	A TOR Self-Schedule will be honored in the market scheduling in preference to enforcing transmission constraints.
Real Time ETC Supply Self Schedule	-5100 to -5900	-150	10200 to -11800	-150	In RTM the range of penalty prices for different ETCs supply self-schedules are much higher in magnitude than generic supply self-schedules but lower than TOR. Energy bid floor is the pricing parameter for all energy supply self-schedules.
Ancillary Service Region Reg-Up and Reg-Down Minimum Requirements	1450	250	2900	250	Scheduling run penalty price is below the one for transmission constraint. Pricing run parameter is set to the AS market bid cap to reflect AS supply shortage.
Ancillary Service Region Spin Minimum Requirements	1400	249	2800	249	Scheduling run penalty price is lower than the one for regulation-up minimum requirement. Pricing run parameter is set to the AS market bid cap to reflect AS supply shortage.
Ancillary Service Region Non-Spin Minimum Requirements	1350	248	2700	248	Scheduling run penalty price is lower than the one for spin minimum requirement. Pricing parameter is set to the AS market bid cap to reflect AS supply shortage.
Ancillary Service Region Maximum Limit on Upward Services	1200	248	2400	248	Scheduling run penalty price is lower than those for minimum requirements to avoid otherwise system-wide shortage by allowing sub-regional relaxation of the maximum requirement. AS market bid cap as pricing

Penalty Price Description	Scheduling Run Value Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
					run to reflect the otherwise system-wide shortage.
Self-scheduled exports not using identified non-RA supply resource	1150	1000	2300	2000	Scheduling run penalty price reflects relatively low priority in protection as compared to other demand categories. Energy bid cap as pricing run parameter to reflect energy supply shortage.
Final IFM Supply Schedule	-1000	-150	-2000	-150	Scheduling run penalty price is much higher in magnitude than supply generic self-schedule but lower than ETCs. Energy bid floor is the pricing parameter for all energy supply self-schedules.
Regulatory Must-Run and Must Take supply curtailment	-1400	-150	-2800	-150	Scheduling run penalty price reflects the higher priority of regulatory must-run and must-take supply received over generic self-schedules for supply resources. Energy bid floor is the pricing parameter for all energy supply self-schedules.
Price-taker supply bids	-400	-150	-800	-150	Generic self-schedules for supply receive higher priority than Economic Bids at the bid floor.
Qualified Load Following self-provision Up or Down	-8500	0	-17000	0	Scheduling run penalty price reflects the highest priority among all categories of AS self-provision. AS bid floor is used as the pricing parameter for any type of AS self-provision.
Day ahead conditionally qualified Reg Up or Down Award	-7750	0	-15500	0	Scheduling run penalty price is higher than the penalty price for energy balance constraint to reflect higher in priority over energy. AS bid floor is pricing parameter for any type of AS self-provision.
Day ahead conditionally	-7700	0	-15400	0	Scheduling run penalty price is lower than the one for

Penalty Price Description	Scheduling Run Value Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
qualified Spin Award					Reg-up. AS bid floor is pricing parameter for any type of AS self-provision.
Day ahead conditionally qualified Non-spin Award	-7650	0	-15300	0	Scheduling run penalty price is lower than the one for Spin. AS bid floor is pricing parameter for any type of AS self-provision.
Conditionally qualified Reg Up or Down Real Time self-provision (RTUC only)	-405	0	-810	0	Scheduling run penalty price allows the conversion of AS self-schedules to Energy to prevent LMP of local area from rising so high as to trigger transmission constraint relaxation. AS bid floor is pricing parameter for any type of AS self-provision.
Conditionally qualified Real Time Spin self-provision (RTUC only)	-400	0	-800	0	Scheduling run penalty price is below the one for regulating-up. AS bid floor is pricing parameter for any type of AS self-provision.
Conditionally qualified Real Time Non-Spin self-provision (RTUC only)	-395	0	-790	0	Scheduling run penalty price is below the one for spin. AS bid floor is pricing parameter for any type of AS self-provision.
Conditionally unqualified Reg Up or Down Real Time self-provision (RTUC only)	-195	0	-390	0	In scheduling run, AS self-provision not qualified in pre-processing can still be considered as an AS bid with higher priority in the Energy/AS co-optimization along with regular AS bids. AS bid floor is pricing parameter for any type of AS self-provision.
Conditionally unqualified Spin Real Time self-provision (RTUC only)	-170	0	-340	0	Same as above.
Conditionally unqualified Non-Spin Real Time	-155	0	-310	0	Same as above.

Penalty Price Description	Scheduling Run Value Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
self-provision (RTUC only)					
System power balance constraint	1100, -155	1000, -155	2200, -155	2000, -155	To reflect the role regulation plays in balancing the system for undersupply conditions when economic bids are exhausted, the ISO allows the system power balance constraint to relax by as much as the seasonal regulation requirement. For over-supply conditions, when economic bids are exhausted, the ISO allows the system power balance constraint to relax to about 10% of the seasonal regulation requirement. The prices are selected to allow for coordinated dispatch of bids that may exist at or near the bid cap, or at or near the bid floor.
Power Balance constraint for individual EIM areas	1100, -750	1000, -150	2200, -750	2000, -150	Subject to the FERC order granting waiver of tariff sections 27.4.3.2 and 27.4.3.4, and consistent with Section 10.1.6 of the BPM for Energy Imbalance Market, which implement the price discovery mechanism overriding the pricing parameters and yielding the last economic signal under constraint relaxation. The scheduling run parameter is set to -750 for the individual EIM areas to coordinate the relaxation of the EIM power balance constraint during over-generation conditions relative to congestion on non-EIM constraints.
EIM Upward Available Balancing Capacity Range	1200 through 1050	Bid in Prices Range for EIM Participating resource	2400 through 2100	Bid in Prices Range for EIM Participating	The Penalty Price Range used for the Available Capacity Range prices to maintain the economic merit order reflected in the energy

Penalty Price Description	Scheduling Run Value Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
		and DEB for EIM Non-Participating		resource and DEB for EIM Non-Participating	bid prices of the allocated energy bid portions
EIM Downward Available Balancing Capacity	-250 through -350	Bid in Prices Range for EIM Participating resource and DEB for EIM Non-Participating	-500 through -700	Bid in Prices Range for EIM Participating resource and DEB for EIM Non-Participating	The Penalty Price Range used for the Available Capacity Range prices to maintain the economic merit order reflected in the energy bid prices of the allocated energy bid portions
EIM Transfer Constraint	1500	1000	3000	2000	Penalty price and pricing parameter consistent with the transmission constraint;
Administrative Flexible Ramp Down Price Floor	-75	-75	-75	-75	Downward Demand Curve Price Cap
Administrative Flexible Ramp Up Price Ceiling	247	247	247	247	Upward Demand Curve Price Cap
EIM Incremental, Flow and EIM Area total Flow	1500	0	3000	0	Penalty price and pricing parameter consistent with the EIM Entitlement Rate of Change constraint;
HASP AS resource protection of energy bid range	8000	1000	16000	2000	Penalty price used for protection of AS range on energy bid curve for HASP AS resources
Exceptional Dispatch	5800	1000	11600	2000	Priority to exceptional dispatches made by operators
Load Serving Generator	1800	1000	3600	2000	Load Serving Generator for supply receive higher priority than Economic Bids at the bid floor.
Exceptional Dispatch for Tie Generators	1600	1000	3200	2000	Priority to exceptional dispatches made by operators for Tie generators
EIM Base scheduled exports	1550	1000	3100	2000	EIM base scheduling priority for export when tagged schedules do not exist

Penalty Price Description	Scheduling Run Value Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
Tagged Quantity for exports	1550	1000	3100	2000	Inter-tie tagged priority for exports. Higher priority than load in real time.
Export self-schedule with RUC schedule	1500	1000	3000	2000	In HASP market an export resource supported with RUC schedule
Export self-schedule with supporting resource and no RUC schedule	1450	1000	2900	2000	In HASP market , a high priority export supported with a non RA resource
EIM Base scheduled imports	-1250	-150	-2500	-150	EIM base scheduling priority for import when tagged schedules do not exist
Tagged Quantity for imports	-1250	-150	-2500	-150	Inter-tie tagged priority for imports. Higher priority than over-generation energy slack
Import self-schedule with RUC schedule	-1200	-150	-2400	-150	In HASP market a RUC scheduled import self-schedule priority. Higher priority than over-generation energy slack
Import self-schedule with no RUC schedule	-1100	-150	-2200	-150	In HASP market a real time submitted self-schedule with no RUC schedule priority. Higher priority than over-generation energy slack
Contingent operating reserves release for energy	1000	1000	2000	2000	Operator released contingent operating reserves can only be dispatched at the pricing Cap
Hourly Proxy Demand resource	1000	1000	2000	2000	Protection for hourly awarded proxy demand resource in markets after HASP
MSS load following instructions	360	360	720	720	For meter sub systems (MSS) load following instruction with in the designated load following capacity
MSS load following down capacity	-8000	-150	-16000	-150	For meter sub systems (MSS) load following down capacity reservation

Penalty Price Description	Scheduling Run Value Based on \$1000 Cap	Pricing Run Value Based on \$1000 Cap	Scheduling Run Value Based on \$2000 Cap	Pricing Run Value Based on \$2000 Cap	Comment
MSS load following up capacity	8000	1000	16000	2000	For meter sub systems (MSS) load following down capacity reservation

Attachment H – Memo and Presentation
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021



Memorandum

To: ISO Board of Governors

From: Anna McKenna, Interim Vice President of Market Policy and Performance

Date: April 19, 2021

Re: **Decision on market enhancements for summer 2021 readiness – load, export and wheeling priorities**

This memorandum requires Board action.

EXECUTIVE SUMMARY

Management proposes changes to the ISO market rules regarding the priorities the market places on serving ISO load, exports, and transactions wheeling through¹ the ISO system when the market encounters constraints and must manage price-taker bids.² These changes result from an expedited stakeholder initiative the ISO conducted in response to last summer's supply shortages to prepare for summer 2021. Management believes the proposed enhancements fairly balance the need to serve load in the ISO balancing authority area (BAA) reliably and provide open access transmission service.

First, Management proposes that price-taker exports not explicitly backed by capacity designated solely to serve external load, referred to as low-priority recallable exports, awarded day-ahead market schedules will have a lower priority than ISO load in the real-time market. The ISO will continue to provide price-taker exports explicitly backed by capacity designated to serve external load, referred to as high-priority non-recallable exports, equal priority to ISO load in the real-time market. However, under today's practices a low-priority recallable export scheduled in the day-ahead market has a higher priority than load in the real-time market. This creates the possibility that a low-priority recallable export is served by ISO resource adequacy capacity, which is

¹ Wheeling through schedules are schedules for energy flowing into and out of the ISO BAA transmission system to serve load outside the ISO BAA. Market participants submit wheeling through transactions to the ISO market as paired import and export as price-taker bids or economic bids. The market schedules both the import and export leg for the same amount.

² A price-taker bid or a self-schedule is a market bid a scheduling coordinator submits to the ISO that indicates a quantity in MWhs but does not specify a price. This indicates the scheduling coordinator is a price-taker. Essentially, price-taker bids or self-schedules are requests the market schedule the transaction irrespective of the market price. In the real-time market, price-taker bids or self-schedules are also day-ahead market schedules for which the market participant has not re-submitted an economic bid.

intended to serve ISO internal load. This proposal removes this unintended outcome and further aligns the market rules with Federal Energy Regulatory Commission precedent that exports supported by ISO resource adequacy capacity are essentially non-firm, recallable sales.

Second, Management proposes several rule changes regarding the designation of capacity backing high-priority non-recallable exports. These changes will better ensure capacity sold to ISO load serving entities is not backing high-priority non-recallable exports. Further, they will ensure designated capacity backing high-priority non-recallable exports is available and physically capable of sustaining the export in real-time so the ISO does not have to support the export using its resource adequacy capacity.

Finally, Management proposes to establish different scheduling priorities in the day-ahead and real-time market for two categories of wheeling through transactions— a priority price-taker wheel and a non-priority price-taker wheel. If the market exhausts economic bids, the market optimization may have to adjust price-taker bids also known as self-schedules based on the scheduling priorities in the tariff. Scheduling priorities are a factor when the market cannot find a feasible solution. This occurs when there is insufficient supply to meet overall demand on the ISO grid, including exports, or when imports and price-taker wheels compete for transmission capacity. The adjustment process can, among other things, reduce imports, exports, wheels, and demand bids. Management proposes that in such circumstances priority price-taker wheels will have the same priority as ISO load and high-priority non-recallable exports. Non-priority price-taker wheels will have a lower priority.

Management proposes to define a priority price-taker wheel as a wheeling through self-schedule backed by a firm power supply contract to serve an external load serving entity's load for the entire month and corresponding monthly firm transmission to the ISO border. The scheduling coordinator for the priority price-taker wheel must notify the ISO it meets these requirements 45 days prior to the applicable month. This aligns with the deadline for ISO load serving entities to make their monthly resource adequacy showings. The proposed requirements demonstrate an external entity depends on and is committed to using the ISO transmission to serve its load similar to ISO load serving entities.

Management also proposes that when the transmission system is constrained and priority price-taker wheels are competing with other schedules (e.g. resource adequacy imports), the ISO will conduct a real-time market schedule adjustment process to allocate transmission capacity pro rata. The proposed wheeling through scheduling priority changes will sunset May 31, 2022. The ISO will be considering longer-term solutions to address these issues. Management believes this interim solution is balanced and fair, particularly given stakeholders' polarized positions. It offers reasonable native load protections, while recognizing certain external BAAs may be relying on wheeling through the ISO to serve their load this summer.

Management is presenting these proposed changes to the EIM Governing Body under its advisory role on April 19, 2021.

Moved, that the ISO Board of Governors approves the proposals for load, exports, and wheel through market scheduling priorities as described in the memorandum dated April 19, 2021; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposal described in the memorandum, including any filings that implement the overarching initiative policy but contain discrete revisions to incorporate Commission guidance in any initial ruling on the proposed tariff amendment.

BACKGROUND

A historic heat wave affected the western United States for several consecutive days in mid-August 2020, causing energy supply shortages that led to two rotating power outages in the ISO footprint on August 14 and 15. The *Final Root Cause Analysis: Mid-August 2020 Extreme Heat Wave* report documents these events.³

The ISO initiated an expedited stakeholder initiative in response to these events to prepare for summer 2021, prevent supply shortfalls, and more fairly address supply shortfalls if they occur. This stakeholder initiative, *Market Enhancements for Summer 2021 Readiness*, produced several market enhancements and an interconnection rule enhancement the ISO Board of Governors approved in March. Management deferred seeking board approval on a final set of enhancements regarding the priorities the market uses to schedule ISO load, exports, and price-taker wheels, so it would have more time to work with stakeholders to finalize its proposal. This memorandum addresses these enhancements.

PROPOSAL

Based on analysis of last August's events, Management proposes three sets of market rule changes regarding the priorities the ISO market places on serving ISO load and honoring price-taker exports and wheels.

Management believes these changes will more fairly allocate supply if the ISO market cannot meet both ISO load and scheduled exports. They will also more fairly allocate transmission capacity when there is insufficient transmission capacity in the real-time to accommodate both wheeling through schedules, imports, and other energy flows.

³ 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.

The following describes these changes.

Export priority

Management proposes that low-priority recallable exports receiving a day-ahead market schedule will have a lower priority than ISO load in the real-time optimization. Today, all exports receiving a schedule the day-ahead market automatically have a higher scheduling priority than load in real-time based on what is found to be feasible in the residual unit commitment process of the day-ahead market, even though they may be supported by resource adequacy capacity dedicated to serve ISO load.

The residual unit commitment process cannot preclude ISO resource adequacy supply from supporting a low-priority recallable export. This can result in allowing the day-ahead market to use ISO resource adequacy capacity to support low-priority recallable export. Because conditions may change, the ISO may need the ISO resource adequacy capacity to meet ISO load in the real-time market, even if it did not find it needed such capacity in the day-ahead market. Management's proposal ensures that in real-time the ISO can use ISO resource adequacy capacity to serve internal load if necessary. The proposed change appropriately affords low-priority recallable exports supplied through the market a lower priority than ISO load in the real-time to better ensure supply used to serve these exports does not come from ISO resource adequacy capacity.

The proposed change is foundational to ensure the real-time market will curtail low-priority recallable exports to avoid the export of ISO resource adequacy capacity during tight system conditions. The proposal also still ensures high-priority non-recallable exports that have secured capacity solely designated to serve external load in advance receive a real-time market priority equal to ISO load.

Designation of capacity for high-priority non-recallable exports

The ISO market rules provide price-taker exports supported by capacity designated to serve external load, *i.e.*, high-priority non-recallable exports, the same priority as serving ISO load (and a higher priority than low-priority recallable exports).

Management proposes several rule changes regarding high-priority non-recallable exports. These changes will better ensure capacity in the ISO BAA backing these exports (1) was not sold to a ISO load serving entity, even if it is not shown on a load serving entity's resource adequacy plan in a given month, and (2) is actually available and physically capable of supporting the high-priority non-recallable export schedule in the real-time market. The changes also include tariff clarifications to account for derates of resources that have part of their capacity supporting high-priority non-recallable exports.

These rule changes will require the scheduling coordinator for a resource designated as backing a high-priority non-recallable export to confirm it has sold the capacity only to the exporter and not to an ISO load serving entity. In addition, the rule changes will specify that the designated capacity must be deliverable.

Management proposes to require the scheduling coordinator for a high-priority non-recallable export and the scheduling coordinator for the designated capacity backing it to coordinate to ensure the high-priority non-recallable export does not exceed the amount the designated resource can support. The rule changes will also specify that if the designated resource is a variable energy resource, the high-priority non-recallable export quantity can be no greater than the resource's forecasted output.

Management also proposes the designated resources supporting a high-priority non-recallable export must participate in the residual unit commitment process up to the high-priority non-recallable export self-scheduled quantity. This requirement is comparable to the requirement that ISO resource adequacy capacity participates in the residual unit commitment process and ensures the capacity designated to serve the high-priority non-recallable export is committed in the residual unit commitment process if necessary. Similar to ISO resource adequacy capacity, the designated resource will be required to participate in the residual unit commitment process at a \$0.00/MWh bid up to the high-priority non-recallable export scheduled quantity. Absent this requirement ISO resource adequacy resources could end up supporting the high-priority non-recallable export instead of the resource that was designated to support it.

In addition, Management proposes that the scheduling coordinator for capacity designated to serve a high-priority non-recallable export must submit energy bids to the real-time market for any capacity backing the export that did not receive a day-ahead market energy schedule. This rule is necessary to ensure the designated resource is available to meet the high-priority non-recallable export, which is intended for external load.

Finally, Management proposes tariff clarifications regarding the treatment of resource derates when only a portion of a resource's capacity is ISO resource adequacy capacity. Derates can affect both a resource's capacity sold to ISO load serving entities and the capacity sold to external entities. The proposed clarifications provide that if a derate occurs, the ISO will allocate the derate to the resource's ISO resource adequacy capacity and non-ISO resource adequacy capacity based on the scheduling coordinator's guidance to the ISO. The proposal will allow the ISO to obtain the information necessary to allocate capacity derates properly and effectively among the various types of capacity. This will enable the ISO to accommodate prorated high-priority non-recallable export exports following unit derates.

Wheel-through price-taker transactions

Management proposes several market rule changes regarding price-taker wheeling through schedules. Management proposes to establish two categories of wheel-

through price-taker schedules: a priority price-taker wheel and a non-priority price-taker wheel. Priority price-taker wheels would have the same scheduling priority in the ISO market as import self-schedules needed to serve ISO load. Non-priority price-taker wheels would have a lower scheduling priority than ISO load and priority price-take wheels.

Management also proposes a pro rata schedule adjustment process that would be conducted after the hour-ahead scheduling process runs in the real-time if the hour-ahead scheduling process run was infeasible. This pro rata schedule adjustment process would allocate constrained transmission capacity between the priority price-taker wheels and imports designated as ISO resource adequacy imports.

Wheeling through schedules can affect the ISO's ability to serve native load when they use constrained transmission capacity. The higher priority currently afforded to wheeling through schedules through the ISO market parameter settings is a particular concern if high demand/tight supply conditions occur across the West this summer. Wheeling through transactions not only could limit imports from serving ISO load, they could limit resource adequacy resources in Northern California from serving internal load. This priority is not required under the ISO tariff. Consistent with the treatment of low-priority non-recallable exports discussed above, Management will modify the ISO market parameters to no longer provide wheel through transactions higher priority than ISO load.

Other BAAs have processes under their Open Access Transmission Tariff frameworks to allow entities to procure transmission capacity in excess of that needed to serve their native load. The ISO operates under a nodal market framework that bundles energy and transmission scheduling together. Because of this, the ISO does not have forward transmission reservations or a process to release priority-scheduling rights to wheeling through transactions that would limit them to the capacity exceeding the amount the ISO needs to serve its native load. The ISO also would have to incorporate this into its transmission planning process.

Management has committed to starting a new stakeholder initiative to consider such a process, but it cannot implement any more extensive changes by summer 2021. Consequently, Management proposes interim changes to its existing market structure to allocate transmission capacity more fairly among ISO native load and wheeling through self-schedules and serving ISO load. Stakeholders indicated that some external entities, particularly in the southwest, have already entered into power supply arrangements to serve their load, and they have planned to deliver that energy by wheeling through the ISO BAA.

Management believes its interim proposal balances the needs and concerns stakeholders have expressed and provides a workable and necessary framework for the ISO operate reliably given the conditions it faces in summer 2021. Management proposes that a priority price-taker wheel (1) must be supported by a monthly firm power supply contract to serve load outside the ISO BAA, and (2) the load serving entity

must have procured monthly peak period firm transmission to the ISO boundary. The scheduling coordinator for the priority price-taker wheel would have to make this showing by 45 days prior to each month (or by June 29, 2021 for July and August 2021 due to the timing of the tariff amendment filing). A firm contract to serve load outside the ISO coupled with procured firm transmission to the ISO border demonstrates an external entity depends on using ISO transmission to serve its load similar to ISO load serving entities. The 45-day notice requirement aligns with ISO load serving entities' monthly resource adequacy showing requirement.

Although the market parameters will be set to provide priority price-taker wheels equal priority to serving ISO load, the market optimization does not ensure a pro rata adjustment of priority price-taker wheels and resource adequacy imports to serve ISO load. An administrative process is necessary to ensure the pro rata adjustments of these equal priority schedules. Consequently, Management also proposes a pro rata schedule adjustment process that the ISO will execute after completion of the hour-ahead scheduling process. This process will be triggered if either the hour-ahead scheduling process cannot meet demand or if it reduces priority price-taker wheels. The process will allocate intertie transmission capacity pro rata between ISO resource adequacy imports and priority price-taker wheels based on the amounts of ISO resource adequacy import bids submitted in the real-time market on an intertie and the priority price-taker wheels. Any ISO resource adequacy import capacity incremented through the administrative process will be treated as exceptional dispatches, which ensure they will at least recovery their bid price. Further, Management proposes that the quantity of price-taker wheels in the pro rata allocation process will be limited by the amount submitted in the day-ahead market. It is necessary for the scheduling coordinators to submit their priority price-taker wheels in the day-ahead market so that the ISO can better evaluate its reliability requirements in the day-ahead, while allowing flexibility to revise them in the real-time market.

To ensure all ISO resource adequacy imports are considered in the real-time, Management proposes an additional market rule change that will schedule all ISO resource adequacy imports in the real-time market in the event the residual unit commitment processes is infeasible and indicates ISO may not be able to meet load in the real-time. This will ensure all resource adequacy import supply is available for the ISO to consider in the pro rata allocation process.

The ISO will use a similar pro rata allocation methodology to allocate Path 26 transmission between northern and southern California if priority price-taker wheels compete with energy flows needed to serve ISO load. This is necessary to prevent priority price-taker wheels from completely preventing resource adequacy resources in Northern California from serving the ISO load that has paid for their capacity.

Additionally, the ISO will develop procedures for system operators to review any priority price-taker wheels that are reduced by the pro rata allocation process. These procedures will identify actions system operators could take that would allow them to increase or restore otherwise reduced wheel-through self-schedules.

Finally, because Management intends the priority price-taker wheels approach as an interim measure until it can develop and implement longer-term measures, Management proposes the tariff provisions specifying these measures expire on May 31, 2022.

POSITIONS OF THE PARTIES

There is widespread stakeholder agreement the ISO needs to conduct a stakeholder process to develop a longer-term process for external entities to obtain scheduling rights for wheeling through schedules on a forward basis. Management believes interim measures are critical given the problems the ISO could face in summer 2021. However, the interim measures are contentious and stakeholders have disparate views about them depending on whether they are ISO load serving entities or external entities that plan to wheel energy across the ISO BAA.

External entities generally maintain the interim measures do not provide a level playing field and unduly favor allocating transmission capacity to serve ISO load. Conversely, stakeholders representing California load serving entities stress that FERC transmission principles allow BAAs to prioritize setting aside capacity to serve native load over making transmission available to external entities to use for wheeling through transactions. They generally maintain that Management's proposal does not go far enough to protect ISO native load. They also note external entities may be able to "cherry-pick" using the ISO transmission system in just the most critical hours, thus displacing imports needed to serve load in those hours, and paying only transmission charges in just a few hours. On the other hand, ISO load serving entities depend entirely on using the ISO system and pay transmission charges in all hours of the month to serve their load. The proposed firm transmission requirement for priority price-taker wheels indicates an external load serving entity's commitment and dependence on using ISO transmission to serve its load, somewhat similar to ISO load serving entities dependence on ISO transmission.

Management believes its proposed interim approach is a balanced way to deal with emergency conditions that may occur this summer. Also, Management believes its proposed requirements will ensure external entities will regularly wheel through the ISO to serve their load and not to just use ISO transmission in the few critical hours when ISO native load most needs to use the system.

One entity opposes eliminating the higher real-time market scheduling priority afforded exports deemed feasible in the residual unit commitment process over serving ISO load. It states the proposal will prevent it from depending on these imports. As described earlier, Management believes this approach is necessary because the RUC process cannot ensure resource adequacy supply will not be used to support an export. If external entities desire a priority equal to ISO native load they should designate non-resource adequacy capacity to support their export. FERC has recognized exports supported capacity designated to serve external load should have a higher priority than exports supported by ISO resource adequacy capacity.

Some stakeholders believe the proposed rules regarding the capabilities of resources supporting high-priority non-recallable exports do not provide sufficient validation to ensure a resource can support such export. They also believe there should be additional validation based on actual variable energy resource output. Management's proposed rules are limited to those the ISO can feasibly implement by this summer. Management plans to develop further enhancements in a subsequent stakeholder initiative.

A more detailed summary of stakeholder comments is included as Attachment A.

The Department of Market Monitoring supports Management's proposals as incremental improvements that should enhance the ISO balancing authority area's reliability in Summer 2021.

The Market Surveillance Committee in their draft opinion support Management's proposals as reasonable, fair interim measures until more comprehensive changes can be implemented. The Market Surveillance Committee's draft opinion is included as Attachment B. They plan to vote on adopting their opinion on April 16, 2021.

CONCLUSION

Management requests the ISO Board of Governors approve Management's load, export, and wheel-thorough scheduling proposals described in this memorandum. They represent fair, reasonable measures that will better ensure the ISO BAA's reliability while reasonably accommodating external entity's need to also use the ISO transmission system.



Decision on Market Enhancements for Summer 2021 Readiness – Export, Load, and Wheeling Priorities

Greg Cook

Executive Director, Market and Infrastructure Policy

Board of Governors Meeting

General Session

April 21, 2021

Management proposes three sets of changes to the market scheduling priorities for exports and wheel-through self-schedules relative to ISO load

1. Change how exports cleared in the day-ahead residual unit commitment process are prioritized relative to ISO load in the real-time market
2. Enhance requirements for designating non-resource adequacy capacity backing high priority export schedules
3. Change market prioritization of wheel-through self-schedules

Management proposes to no longer prioritize exports clearing the day-ahead market over serving ISO load

- Residual unit commitment process does not ensure resource adequacy capacity needed to serve ISO load in real-time could be supporting exports clearing day-ahead that had not designated capacity to serve external load
- Propose to enforce the two classes of export schedules all the way through the real-time market:
 - exports backed by capacity designated to serve external load (*i.e.*, non-recallable exports) have a higher priority, same as ISO load
 - exports not backed by capacity designated to serve external load (*i.e.*, recallable exports) have a lower scheduling priority than ISO load

Management proposes enhancements to the rules specifying non-resource adequacy capacity to back high priority exports

- Identify resources that can be designated to support high-priority exports
- Resources identified as supporting high priority exports must confirm a load-serving entity outside of the ISO has a right to the capacity
- Resource will be notified if designated to support a high-priority export to ensure it can meet its obligations
- Variable energy resources can be designated to back high priority exports if export quantity is no greater than the lowest fifteen-minute forecasted output for the hour

Management proposes clarifications to how outages are applied to partial resource adequacy resources that may back a high priority export

- If a scheduling coordinator notifies the ISO of a contract term that specifies how outages are applied to the resource adequacy and non-resource adequacy portion of the capacity, those terms will be reflected in the outage distribution
- If not specified, the ISO will apply a pro-rata distribution of the outage against the resource adequacy and non resource adequacy capacity

Management proposes changes to the prioritization of wheel-through self-schedules

- Currently, wheel-through self-schedules cleared in the residual unit commitment process have a higher scheduling priority than imports or internal generation needed to serve ISO load
 - Wheel-throughs consist of balanced import and export legs
 - Wheel-throughs can use transmission capacity that is needed by resource adequacy supply to serve ISO load
- Change priorities so that high-priority wheel-through self-schedules have the same priority as serving load with self-scheduled supply

Management proposes to differentiate high-priority and low-priority wheels

- High-priority wheels are available for external load serving entities that are planning on using the ISO system to meet their reliability needs
- High priority wheels are established by:
 - Notifying the ISO 45 days prior to the month the MW quantity of the wheel
 - Attesting that they have secured firm transmission to the ISO border for the month for the hours of their contract to serve load
- Proposed changes would expire May 31, 2022

Management proposes a new process to equitably allocate transmission if the ISO's hour-ahead scheduling process is infeasible

- Pro rata allocation between resource adequacy supply bidding into the hour-ahead scheduling process and high-priority wheels bidding into the hour-ahead scheduling process
 - Wheel quantity limited by day-ahead schedule
- Pro rata allocation applies to binding intertie constraints and binding constraints on Path 26
- Operator judgment ultimately determines what schedules are supported

Stakeholders concerned about proposed changes

Topic & Level of Contention	Concern	Management Response
Residual unit commitment export priority rules - Medium	Day-ahead market results should carry through with priority into the real-time market	Residual unit commitment is unable to ensure that RA supply will not be used to support an export making it unavailable to support ISO load, which is inconsistent with the RA real-time must offer obligation
High-priority export attestation rules – Medium	ISO does not have sufficient validation to ensure a resource can support a high-priority export, including validation based on variable energy resources output	Agree validation is insufficient which is why attestation rules are needed. Longer-term solution will develop improved validation rules to address concerns from both sides

Stakeholders concerned about proposed changes

Topic & Level of Contention	Concern	Management Response
Outage distribution between RA capacity and high-priority export capacity - Low	This issue was not addressed in Final Proposal	Agree that reducing high-priority export capacity before RA capacity when a unit is de-rated is not equitable. Included tariff clarifications to address
Wheel-through priority - High	External: goes too far and restricts open access Internal: does not go far enough to protect ISO load	Proposal provides a balanced approach to address emergency conditions that may occur this summer. This is an interim approach that will be replaced once the ISO implements a process to allow forward procurement of wheeling capability

Management requests the Board approve the proposed export, load, and wheeling priority changes

- Changes fairly allocate limited supply during emergency events when the ISO market cannot meet both ISO load and scheduled exports
- Changes fairly allocate transmission capacity when there is insufficient transmission capacity to accommodate both wheel-through schedules and imports/other energy flows

Attachment I – Market Surveillance Committee Opinion
Load, Exports & Wheeling Tariff Amendment
California Independent System Operator Corporation
April 28, 2021

Opinion on Market Enhancements for Summer 2021 Readiness

James Bushnell, Member
Scott M. Harvey, Member
Benjamin F. Hobbs, Chair

Members of the Market Surveillance Committee of the California ISO

Final of April 16, 2021

1. Introduction and Summary

The Market Surveillance Committee has been asked to comment on elements of the summer readiness initiative.¹ The initiative is in response to the events of August 2020,² and its purpose is to implement changes to market rules and procedures that are practical to implement in the near-term to help ensure grid reliability during the upcoming summer high load period.³ The initiative is recommending changes to several features of the ISO markets. In previous opinions we have commented on changes to such elements as scarcity pricing, resource sufficiency evaluation, and management of battery storage.⁴ In this opinion we focus on the last remaining major issue: the treatment of export and wheel-through transactions in the CAISO balancing authority area during extreme operating conditions through adjustments to load scheduling priorities.

In preparation for this Opinion, the MSC held public meetings that included agenda items addressing the heat wave events of August 2020 on October 9, 2020 and November 13, 2020. The MSC then reviewed the elements of the Summer 2021 readiness initiative with stakeholders and ISO staff in a public meeting held on February 11, 2021.

In the next section, we provide background on the proposal, including discussions of issues concerning prioritization of transactions by an individual CAISO, inconsistencies in transmission capacity allocation among different BAs, how CAISO energy market bid caps and inadequate

¹ *Market Enhancements for 2021 Summer Readiness: Final Proposal*. California Independent System Operator. March 19, 2021. <http://www.caiso.com/InitiativeDocuments/FinalProposal-MarketEnhancements-Summer2021Readiness.pdf>

² See California Independent System Operator, California Public Utilities Commission, and California Energy Commission, *Root Cause Analysis, Mid-August 2020 Extreme Heat Wave, Final Report*, January 13, 2021 www.caiso.com/Documents/Final-Root-Cause-Analysis-Mid-August-2020-Extreme-Heat-Wave.pdf

³ See <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Market-enhancements-for-summer-2021-readiness>

⁴ J. Bushnell, S. M. Harvey, and B.F. Hobbs, *Opinion on Market Enhancements for Summer 2021 Readiness*, Market Surveillance Committee of the California ISO, March 8, 2021, www.caiso.com/Documents/MSCOpiniononMarketEnhancementsfor2021SummerReadiness-Mar8_2021.pdf; J. Bushnell, S. M. Harvey, and B.F. Hobbs, *Opinion on Resource Adequacy Enhancements Phase I: Minimum State of Charge Requirements*, Market Surveillance Committee of the California ISO, March 23, 2021, www.caiso.com/Documents/FinalMSCOpiniononresourceadequacyenhancementsphase1MSOC-Mar23_2021.pdf

scarcity pricing can exacerbate problems in transmission allocation, and finally a discussion of challenges faced in crafting this proposal. Then in the following sections, we discuss specific issues addressed in the proposal concerning two types of transactions: exports from internal resources (Section 3) and self-scheduled wheel-throughs (Section 4). A summary concludes this Opinion.

2. Background

Transfer capability for imports and exports among balancing authorities (BAs) in the western North America markets is a scarce and often valuable resource. Over time, a complex set of administrative rules and market-based methods have evolved to allocate this capacity among competing uses. The complexities of implementing these rules to prioritize capacity among different uses sometimes leads to unanticipated and inefficient consequences within a BA, while different rules in different markets leads to contradictions and concerns about inconsistent treatment across BAs. In particular, in the CAISO in August 2020, prioritization among classes of exports and CAISO load may have contributed to the need to curtail CAISO loads. The multiple and sometimes contradictory sets of rules among different BAs have made it difficult to propose CAISO rule changes that are consistent with precedent and practice throughout the rest of the west and the philosophy of open access and can also be implemented prior to summer 2021. In this section, we first discuss each of these two general issues. We then also point out how certain features of the CAISO markets, in particular its bid cap and the incomplete nature of its present scarcity pricing mechanisms, exacerbate the problems that can arise from unclear prioritization within the CAISO and inconsistencies among BAs. Finally, this section closes with a brief summary of the general thrust of the ISO proposal and the objectives it needs to balance.

We consider first the general issue of potential unintended effects of within-CAISO prioritizations of imports, exports, and wheel-throughs. This prioritization is implemented through explicit rules as well as implicitly through constraint violation penalties in the market scheduling procedures. One contributing factor to stressed system conditions in August was the relatively high level of exports that cleared the day-ahead market and as a consequence, under the rules in place at the time received priority above real-time load. An appreciable portion of these exports were not explicitly supported by non-RA resources within the CAISO. Department of Market Monitoring calculations, portrayed in Figure 3.38 of the DMM report, indicate that gross exports during hour ending 19 and 20 on August 14 exceeded 3000 MW. In the evening peak hours studied by DMM over the period August 12 through 17, DMM concludes that the majority of exports were supported by spot purchases in the IFM, while 1000 MW or less of the exports were linked to resources without any resource adequacy (non-RA) obligations to CAISO Load Serving Entities (LSEs) and hence might have been supported by the output of a resource under contract to another BA.⁵ Changes in RUC and subsequently in real-time bidding rules, which were implemented before the September heatwave, appear to have largely eliminated the risk of the export of power bought in the IFM but supported by CAISO RA resources that were

⁵ See CAISO Department of Market Monitoring, *Report on System and Market Conditions, Issues and Performance: August and September 2020*, pp. 47-51, particularly Figures 3.38 and 3.39.

needed to avoid shedding CAISO load, while allowing exports supported by the resources of other BAs located within the CAISO footprint, during the heatwave ending September 6.⁶

Concerning the second general issue of the multiplicity of approaches among BAs for allocating inter-BA transfer capability, the rules and market procedures that each BA uses reflects their history, resource mix, and location, within the constraints of FERC open access requirements. Each set of rules strikes a balance between meeting the reliability needs of native load and the potential benefits to load resulting from greater transmission sales or sales of excess generation at market-based rates.

The CAISO is in a somewhat different position because it does not have a generation affiliate that can make firm power sales at market-based rates, and its transmission rate design does not provide for long-term sales of firm transmission at regulated rates per megawatt over a month or year. Instead, the CAISO tariff charges for transmission use on a per megawatt-hour basis, when it is actually used. The CAISO needs to take measures that better ensure that customers of CAISO LSEs gain access to the reliability benefits provided by the generation and transmission capacity owned or contracted for to meet Resource Adequacy (RA) requirements, while also enabling resources--either those located within the CAISO or those in other BAs wanting to use ISO transmission capability--to sell power to LSEs located in other BAs. Conversely, LSEs within the CAISO benefit from being able to buy power and enter into resource adequacy contracts with resources located in BAs external to the CAISO. Moreover, the data indicates to us that there is much more CAISO RA capacity located outside the CAISO than there is RA contracted to other BAs located within the CAISO, so CAISO LSEs enjoy substantial benefits from the application of FERC open access requirements to the West.

As we discuss below, there are important differences between the paradigms and time horizons used by CAISO for planning and marketing both transmission and generation and those paradigms adopted by other western BAs. The seams between these paradigms were tested in August 2020, and the experiences of that week exposed the need to reconcile the two systems as much as possible as quickly as possible.

LSEs within the CAISO should recognize the important short and long-term benefits of the CAISO being seen as a reliable and consistent trading partner within the western grid. When a BA blocks the use of generation or transmission resources under contract with neighboring BAs, it undermines the ability of all BAs to rely upon resources located within another's footprint to diversify resource portfolios and reduce reliability risks, and could violate FERC open-access principles. BAs outside of the CAISO should recognize that CAISO entities have in many ways gone farther in making their full network resources available to all western grid participants than any other BA in the West. Load within CAISO, like the load of other western BAs, is entitled to use its transmission system to deliver power from designated resources to network load using network transmission service. The CAISO, in proposing these measures, seeks to remain faithful to the principle of providing open access to its transmission system while retaining its ability to use its transmission system and designated network resources to meet local planning and reliability needs. Unfortunately, any transition in the management of CAISO resources will

⁶ Ibid, pp. 53-55.

create a conflict between the benefits of any adjustments, no matter how justified, and the reasonable expectations of stakeholders who have been making resource plans under the current protocols.

The third general issue concerns CAISO market rules that can compound difficulties in securing needed imports. It is important to recognize the economic incentives that underpin the demand for both energy imports and exports in the CAISO system. A key element is the level of the CAISO's bid cap and associated scarcity values applied to its pricing.⁷ During the August 2020 heatwave, prices of some bilateral transactions reached levels above the CAISO bid cap, implying that buyers outside of the CAISO were willing to pay more for power than the CAISO market's maximum prices. When these high load conditions arise, it creates demand to both export power from the CAISO system and to wheel power from lower priced regions (in this case the Pacific northwest) through the CAISO to higher priced regions such as the desert southwest. As long as it is possible for LSEs outside of California to substantially outbid LSEs in California for scarce power, there will be unavoidable additional pressure placed on both the energy supply and the transmission capacity of the CAISO system. The measures developed in this initiative seek to better assure that energy from resources with RA contracts to CAISO LSEs does not get implicitly or explicitly exported if those exports would require shedding of CAISO firm load. However, it should also be recognized that any benefits of low settlement prices during CAISO scarcity conditions come at the expense of being potentially unable to attract sufficient resources to ensure reliable supply, especially if those needs exceed RA capacity. The relatively low level of the CAISO scarcity prices will also limit the effectiveness of some of the proposed changes relating to wheel-throughs if CAISO RA resources offer supply into the CAISO market at economic prices. The need for special wheel-through rules for constrained import interfaces would be greatly reduced if CAISO prices, and as a consequence the congestion cost of wheels, rose to higher levels during load shedding or near load shedding conditions.

Turning to the CAISO proposal, it modifies the effective priorities of various categories of price taking export and wheel-through transactions relative to using energy or transmission to meet CAISO load. Mechanically this is accomplished through changes to the penalty parameters used in the scheduling run of the market software used to schedule wheel-throughs, imports, and exports. If demand for supply or transmission exceeds the available capacity at the bid cap, penalty parameters are applied to allocate the available capacity across categories of price-taking transactions. Transactions with lower penalty parameter costs will be cut before those with higher penalty parameter costs, after adjustment for the transactions' relative impact on the binding constraints. The proposal also tightens the criteria required for certain export transactions to qualify as priority price-taking exports (PT exports) and creates a new category of high priority price-taking wheel-through transactions (PT wheels). There is no analogous market-based process in other western BAs as they do not clear a day-ahead market in a market engine, but instead enter into firm energy sales on a discretionary basis at market-based rates.

⁷ For a detailed discussion of penalty values and their role in determining prices during scarcity see J. Bushnell, S.M. Harvey, and B.F. Hobbs, *Opinion on Revisions to Import Bidding and Market Parameters for Compliance with FERC Order 831*, Market Surveillance Committee of the CAISO, September 9, 2020, www.caiso.com/Documents/MS-OpiniononFERC831ImportBiddingandMarketParameters-Sep9_2020.pdf

As we discuss below, the CAISO's challenge in this process is to identify the transmission and generation resources necessary to provide reliable service to its network load, and those transmission resources that can be made available for use by other BAs to transmit economy energy transactions without degrading expected network reliability. The task is further complicated by the extent to which neighboring BAs have assumed a continuation of current protocols when planning for their own resource needs. In the context of generating capacity, a reasonable principle would be that CAISO treat exports from its internal resources contracted as RA (or equivalent) to outside BAs equivalently to how it expects outside BAs to treat capacity under California RA contracts that is located outside of California. One difficulty in applying this principle is defining what types of contracts and arrangements should be viewed as the equivalent of California RA capacity. Unlike transmission operators in other BAs, the CAISO does not have a merchant arm that enters into long-term sales of firm power at a market-based price that is in excess of incremental cost. Within the CAISO BA, such long-term sales of firm power can only be made by individual generation owners with generation located within the CAISO BA that they do not show to meet CAISO RA requirements. Any exports cleared in the CAISO day-ahead market supported by CAISO RA are necessarily spot sales made at incremental cost, not discretionary long-term sales of capacity at negotiated market-based prices.

Identifying the class of generation resources to be granted high priority for export is indeed difficult, but we note that the current proposal would give not allow *any* export transaction, other than those associated with legacy transmission ownership or contract rights, to have priority over serving California load, but would put serving exports supported by non-RA capacity on par with serving California load.

The CAISO's general challenge in the context of transmission products is to provide a reasonable framework for external BAs to make use of the CAISO transmission system during extreme operating conditions despite not having requested or paid for firm transmission service on the CAISO system, within a CAISO transmission pricing design that does not have provisions for such payments. While the current CAISO approach can be construed as far more "open" than that found in neighboring BAs, it is an approach that has been in place for over a decade and commercial practices have adapted to it. Other than the carve-out for ETC and TORs, the CAISO system has not had a process for identifying and allocating the available transmission capacity (ATC) between native load, and the amount it can reliably market as firm transmission service for use by other BAs outside the day-ahead and real-time market processes. Moreover, the CAISO design does not establish a framework for defining a capacity benefit margin, a measure that is typically developed in the determination of ATC.⁸

In the following two sections, we discuss in turn the detailed issues associated with managing exports from internal resources (Section 3) and self-scheduled wheel-throughs (Section 4).

⁸ See, for example, the discussions of ATC calculation, capacity benefit markets and transmission reliability margins on the PJM OATT (www.pjm.com/markets-and-operations/etools/oasis/atc-information); see also PJM Manual 2 Transmission Service Request, March 29, 2021. We have not reviewed the OATTs of the many transmission providers participating in this stakeholder process but we expect they have similar provisions for taking account of firm imports in calculating ATC and have procedures for setting a capacity benefit margin.

3. Exports from Internal Resources

The ISO and CPUC have devoted enormous attention to the long-term forecasting of native load, counting of internal resource capacity, and policy regarding imports in developing the ISO's Resource Adequacy (RA) framework. The experiences in August exposed that the system lacked sufficient mechanisms to guarantee that resources contracted for, and shown, to meet the RA requirement, even if available as planned, would be reserved for use to serve CAISO load during extreme operating conditions such as those on August 14 and 15, 2020, and not used to support economic exports to neighboring control areas during times of extreme system stress when the CAISO is shedding load.

Outside of the CAISO, other western BAs make important distinctions between energy transactions considered firm and those that are non-firm. Export sales are subject to relatively strong screening criteria before being made as firm sales at market-based rates, rather than at incremental generating cost. Several transmission providers commented that they would not, as a general business practice, curtail firm exports to prevent a shortage of energy serving native load, even though standard contract terms and NERC procedures appear to give them the authority to do so.⁹ However, other BAs also make non-firm economy energy sales that are subject to curtailment. By contrast, the CAISO has no mechanism for making discretionary firm energy export sales at market-based rates. The CAISO is a transmission provider but does not have an affiliated generation arm able to make such market-based sales. Any firm power sales from resources within the CAISO need to be made by the resource owner, supported by capacity that has not been shown as CAISO RA. This reflects the historical evolution of transmission capacity allocation, where the firm/non-firm distinction is a legacy of pre-Order 888 and 2000 systems that have evolved over decades, while the CAISO system is based on the open access/spot market-based allocation championed by FERC in its standard market practice/wholesale market platform initiatives.

At present, the penalty parameters the CAISO applies in its market software when different types of transactions are curtailed establish relative priorities for those transactions when balance between supply and demand in the energy market cannot be achieved in the solution, even at the price cap (e.g. there are more price-taking transactions than can be scheduled without violating transmission or energy balance constraints) as can be the case during periods of system stress.

Prior to the August heatwave, the CAISO real-time interchange scheduling software placed high priority on transactions clearing its day-ahead integrated forward market (IFM) when demand exceeded supply at the price cap. The software changes implemented after the August heatwave provided that only export transactions clearing the Residual Unit Commitment (RUC) process would receive priority equivalent to or potentially greater than CAISO load. The new proposal would restrict this high priority to exports linked to specific non-RA resources, which we believe is consistent with the practices of other ISOs and BAs. It would also define the priority of

⁹ See Comments of Select EIM Entities on the CAISO's Market Enhancements for Summer 2021 Readiness Initiative January Stakeholders Workshops. January 20, 2021.
<https://stakeholdercenter.caiso.com/StakeholderInitiatives/DownloadFile/f9cbde71-08ca-4f84-b2dc-241217c93943>

exports from units within the CAISO that are under contract to a LSE in another BA to have priority status equivalent to native load.¹⁰

Exports cleared in the CAISO's day-ahead market, but not supported by non-RA capacity, are essentially equivalent to non-firm economy energy sales. They are financially firm, and the CAISO will commit and dispatch generation at a cost of up to its bid cap to enable a price taking export to flow in real-time, but they are subject to curtailment if the CAISO does not have enough capacity to meet ISO load at the price cap, \$1000/MWh (or \$2000/MWh under some conditions). This appears to us to be consistent with, or superior to, the practices of other BAs with respect to non-firm energy sales that they choose to make on a discretionary basis.

Differences arise with respect to firm energy sales. Some non-CAISO BAs state that they assign a higher priority to firm exports than even to their native load as a matter of business practice, although they are not under contractual obligation to do so.¹¹ However, none of these non-CAISO BAs appear to claim that they assign such a priority to non-firm economy energy sales. As explained above, the CAISO has no mechanism to make long term sales of firm power at market-based rates, since it is a transmission provider not a generation owner. Such long-term firm sales at market-based rates would have to be made by individual resource owners within the CAISO that have capacity that has not been shown to meet CAISO resource adequacy obligations, and is therefore available for sale on a long-term firm basis. The changes proposed by the CAISO would reduce the priority of exports backed by non-RA resources to be equivalent to, rather than higher than, the priority of CAISO load in both day ahead and real-time markets. This change appears to align CAISO standards with the contractual requirements, but not the more generous stated business practices, of other BAs. The change, by keeping priority exports equivalent to load, is also consistent with principles previously approved by FERC for the CAISO.¹²

Note that with the proposed changes, CAISO load, as reflected in its HASP and RTD forecasts, will receive higher priority than spot export energy purchased in the IFM that is not explicitly backed by an internal non-RA resource. This defines spot purchases made in the IFM to have "firmness" consistent with economy energy sold by other BAs.

It is conceivable that the CAISO's ability to curtail non-firm energy sales could somewhat reduce the incentive of CAISO LSEs to purchase their full load requirements in the IFM if they exceed what they have contracted with RA or internal non-RA resources. However, the risk of load shedding provides little incentive for individual LSEs to purchase power at high prices because responsibility for load shedding within the CAISO is not tied to the net short position of

¹⁰ *Final Proposal*, p. 17.

¹¹ "It is the general practice across the West that entities do not curtail firm exports as a result of lack of supply." Comments of Select EIM Entities. January 20, 2021, p. 1. <https://stakeholdercenter.caiso.com/Common/DownloadFile/62696ceb-02aa-4078-8fec-cff65f5ca7e1>.

¹² The FERC order states "We accept the modifications proposed by the CAISO, to treat export demand the same as CAISO demand, if that export demand is not served by capacity reserved for resource adequacy or RUC use." *California Indep. Sys. Operator Corp.*, 116 FERC, ¶ 61,274 at P 1282 (2006). http://www.caiso.com/Documents/September21_2006OrderConditionallyAccepting2_9_06MRTUfilinginDocketNos_ER06-615-000andER02-1656-027_etal_.pdf

individual LSEs. Indeed, some LSEs may know that they will not be called upon to shed load no matter how short they are in real-time. Under the proposal, shifting load from the IFM to the real-time markets would no longer reduce the priority attached to that internal load, and so might weaken incentives to CAISO LSEs to procure their full load requirements day-ahead.

The changes to the current design implemented by this proposal seek to ensure that internal resources that have not contracted to serve the load of an external buyer will not be used to support exports when the system is under stress and there is insufficient supply to meet both CAISO load and price-taking exports at the bid cap. This change reduces the possibility that the CAISO markets will issue schedules that allow for exports from internal RA resources to support export transactions rather than schedule the RA resources to serve CAISO load.

The proposal therefore is designed to limit high priority exports to transactions supported by CAISO internal capacity with some form of advanced agreement with external load. This concept presents implementation challenges. While several approaches for the validation of non-RA resources used to support exports prior to, or during, the operation of the IFM were considered, CAISO staff concluded that such approaches could not be implemented prior to summer 2021, and so are not part of the present proposal. Therefore, the main mechanisms to prevent exports supported by internal RA resources under the proposed summer 2021 design are first, the requirement that resources identified to support priority price-taking export transactions (PT exports) participate in the RUC process day-ahead¹³ and, second, that the scheduling coordinators (SC) managing the non-RA resources that would be used to support exports attest that these resources have been “forward contracted” with an external LSE entity and their forecast or dispatchable output must be sufficient to support the full amount of the export schedule.¹⁴ If the resource supporting an export is not scheduled to operate (e.g., not needed) in the RUC process, a non-RA resource must be declared and participate in the real-time market for this export (which would have received a RUC schedule) to maintain its native-load-equivalent priority.

These requirements should eliminate the potential for CAISO RA resources to be used to support high levels of exports to other BAs during extreme operating conditions, as appears to have happened at times during the August and September heat waves. These rules would enable some amounts of energy from resources that might have some kind of contract with California LSEs (including retail access suppliers) but was not shown as CAISO RA to be sold as RA capacity to another BA and used to support exports. This is consistent with the ability of resources located outside the CAISO to enter into contracts to sell RA to CAISO LSEs as long as they have not sold their RA capacity to some other BA.

One benefit of the RUC participation requirement is to ensure that there is some *real* resource identified and able to support the export, and to avoid potential double counting of resources that might otherwise have been implicitly used to support both native load and an export. In this

¹³ This ensures that the resource could be committed if needed to support the export transaction.

¹⁴ The CAISO will revise the tariff to include a rule stating that “by allowing the resource to be designated, the scheduling coordinator of the resource attests the generation has been forward contracted with an external load-serving entity.” *Draft Final Proposal*, p. 18.

sense it is an important “reality check” that has not been in place up until now, but it does not significantly change the short-term financial incentives for export transactions. The implicit energy market penalty for non-performance by a non-RA resource used to support an export would therefore not be much different than those faced by a convergence bid and would be capped at \$1000/MWh (or \$2000/MWh if the Order 831 process is triggered).¹⁵

In addition to owing imbalance costs if scheduled, the other main deterrent to a RA or underperforming resource providing support for PT exports under the interim design for Summer 2021 would be an implicit attestation, reflected in the CAISOs resource master file, that the resource had enough output to support the export that would be implicit in declaring that resource for the export.¹⁶ As we understand it, the designation of “forward contracted” would be applied to a resource’s designation in the CAISO’s unit master-file, where changes can be made to a resource’s characteristics with a five-day notice. Therefore, transactions that might change a unit’s status from ineligible to eligible for supporting PT exports would need to be contracted for no less than five days prior to the need for that export. Since RA capacity must be shown 45 days before the month it will be relied upon, these mechanisms should prevent capacity that is shown as RA from supporting a PT export. Doing so would contradict the implicit attestation.

Conditions where CAISO prices may be below those paid for power outside of CAISO, combined with the policy of curtailing CAISO load irrespective of which LSE does not have enough resources to cover its load during shortage events, can still create incentives potentially detrimental to CAISO reliability. For example, if prices outside of California were high enough, a non-RA resource may find it lucrative to reach a single or multiday agreement in advance of a series of stressed days to allow for export declaration. Even if such a resource were under a longer-term (non-RA) contract with a California-based load-serving entity, that LSE may also find it lucrative to allow such an export arrangement if it does not need that capacity to meet its CAISO RA requirement. The inability of California to be able to effectively compete with external markets as a result of the price cap in such circumstances could create reliability issues if resource needs exceed the procured RA capacity.

Thus, absent an increase in the CAISO scarcity-pricing parameters to allow prices to rise above \$1000/MWh (or \$2000 if FERC Order 831 is triggered), there will at times be incentives to export power supplied by non-RA resources from the CAISO system when scarcity conditions extend outside the CAISO. The most robust solution is not to erect rule-based barriers to prevent such exports, but for LSEs to contract for sufficient resources to meet their RA requirements and for the California market to institute full scarcity pricing and other measures so that its prices during stressed conditions better reflect the value of that power. Fully addressing this would require longer term changes to the CAISO scarcity pricing design.

¹⁵ Moreover, there were periods in August when ISO load was armed for shedding yet the price of exports was far below \$1000/MWh. Changes recently adopted by CAISO should raise prices to the bid cap whenever load is armed for shedding in the future. *Final Proposal*, p. 31.

¹⁶ *Final Proposal*, p. 19. The attestation is being applied here as a short-term measure given that CAISO feels it does not have the time to develop more complex designs that could make direct checks of resource capability. For example, exports could be capped at the projected RTPD output of the resource.

Overall, the measures proposed by the CAISO should reduce, but not completely eliminate, any remaining possibility that the output of resources procured by California LSEs to meet their RA requirements would be exported during scarcity conditions. There would be a direct identification of which resources were supporting PT exports and if those resources had previously been contracted and shown to support the load of a CAISO LSE. The measures also consolidate and clarify the priorities given to export purchase out of the CAISO's day-ahead market by reserving priority exports self-attested to be backed by non-RA resources. The measures provide a process through which energy from non-RA resources can be freely marketed throughout the western grid. No export transaction, however, would receive a priority higher than CAISO load.

In the longer run, it would be beneficial for CAISO and neighboring BAs to reach agreements for reciprocal treatment of RA (and RA-equivalent) resources. To the extent that CAISO and its LSEs expect that their imports from external RA resources should not be cut, except for transmission congestion, such agreements would help to clarify the appropriate priority status and penalty values for exports from the CAISO system.

4. Wheel-Through Self Schedules

A closely related issue to the export of energy from CAISO under stressed conditions is the treatment of wheel-through transactions under similar conditions. A wheel-through transaction consists of a pair of transactions combining an import into one part of the CAISO system and an export from another part. Under stressed conditions, various constraints can limit both the CAISO's ability to allow imports over congested intertie transmission, or to accommodate wheel-through flows on congested internal transmission constraints such as Path 26, and its ability to accommodate exports without shedding native load. From a reliability standpoint it doesn't matter whose power is flowing into the CAISO over a congested intertie, but it does matter whether that imported energy will be exported rather than used to meet native load. Therefore, there can be direct competition for scarce transmission between wheel-through transactions and native load during such stressed system conditions.

Under open-access principles dating back to FERC Order 888, transmission owners must accommodate transmission service requests in a non-discriminatory manner, as long as those transmission facilities can reliably accommodate such a request. As we understand it, open access principles do not in practice require transmission-owning utilities to market transmission that has been reserved on a planning basis to meet their own native load. Thus, available transmission capacity (ATC) would not include the transmission reserved to meet native load. In traditional vertically integrated utilities, these transmission transactions play out over relatively long-term time horizons, allowing for impact studies and even opportunities to expand grid capacity, if necessary, before physical transmission access rights are sold.

Within the western grid, however there is a clash of paradigms with regards to how transmission rights are nominated and awarded to meet native load. In particular, the CAISO does not require that transmission service be purchased in advance and does not have rules governing the purchase of firm transmission service, instead charging for transmission usage by internal and external load on a per megawatt hour basis to recover embedded costs. (TAC) and charging for

redispatch costs in the LMP prices. The CAISO therefore has never calculated an ATC that accounts for the transmission reserved to accommodate firm imports (RA imports serving native load) or provide a capacity benefit margin. Nor does the CAISO have rules that allow LSEs in external BAs to purchase firm transmission service. These features of the CAISO transmission service design have apparently not been an issue in the past. Nor has there been public discussion of the amount or nature of wheel-through transactions during August 2020. Nevertheless, the proposed changes in curtailment of spot market exports for summer 2021 could result in external BAs making more use of wheel-through transactions than they have in the past, particular during extreme high load conditions when there is a potential for exports not supported by non-RA capacity to be curtailed. Within the current paradigm, there is no mechanism for reserving physical priority access to CAISO transmission in advance of the daily market.

The implication of the CAISO's transmission service design is that in the CAISO's IFM and real-time intertie scheduling processes (HASP and RTPD), native load competes for all transmission capacity, not just the capacity remaining after the capacity needed to meet native load is reserved. In this sense, short-run CAISO transmission access has been far more "open" than in non-ISO BAs. Over the longer term there are several options for defining entitlements to use the CAISO transmission system within the CAISO's market structure. One approach that would make the CAISO approach more analogous to neighboring areas would be to grant scheduling priority, applicable only as a "tie-breaker" when the market does not resolve congestion, to financial transmission rights that are awarded or purchased through the CAISOs CRR process. Another option would be to establish prices for the purchase of firm transmission service and calculate ATC on each intertie and across internal CAISO constraints, taking account of the transmission capacity used to support resource adequacy needs and a specified capacity benefit margin. To the extent that ATC is available, external LSEs would be allowed to purchase firm transmission and gain priority access for the transactions using this newly established firm transmission service (in the case tie-breaking is required) over other transactions, such as wheel-through transactions, that are bidding to use the same capacity at the same price. This second option would require a significant market design effort as well as a FERC filing to establish the charge for the purchase of firm transmission service over external interfaces.¹⁷

The CAISO staff's position is that changes along these lines would be beneficial but could have unintended consequences and would be too complex to fully vet through proper stakeholder and testing processes as well as receive FERC approval prior to implementation this summer. As things currently stand, all self-scheduled wheel-through transactions would have the highest priority for access to the CAISO system, despite not having purchased firm transmission service. Absent changes in this design, the penalty prices used to schedule wheels in the IFM and HASP could cause imports serving native load to be reduced before any self-scheduled wheel transaction would be curtailed.¹⁸ The potential degradation of local reliability to accommodate

¹⁷ The ISO is starting a new Maximum Import Capability initiative to address this and other issues <https://stakeholdercenter.caiso.com/StakeholderInitiatives/Maximum-import-capability-enhancements>.

¹⁸ Wheels currently enjoy priority because the import leg of a self-scheduled wheel in IFM has a penalty value of -\$650 and the export leg has a penalty of \$1450. By contrast a self-scheduled import (not linked to an export) currently has a penalty price of -\$450. The penalty for not meeting load is \$1450. Therefore the "cost" of curtailing

short-term wheel-through transactions goes further than what is expected under open access principles as we have articulated them above.

Therefore, for the coming summer the CAISO proposes to create two classes of wheeling transactions, a “priority wheel” (PT wheel) self-schedule, defined below, and a low-priority (LPT wheel) self-schedule.¹⁹ The proposal would adjust the penalty values applied to the new LPT wheel-through transactions in the scheduling run of the IFM and HASP. The priority of the export half of a LPT wheel-through would be the same as for a LPT export and the import half of a wheel-through would be treated as a zero-priced economic import bid. These two halves of the transaction would be linked in the optimization. In the IFM, this change would have the effect of applying a zero penalty to cutting a LPT wheel-through import and a \$1150/MWh penalty to cutting the LPT wheel export, for a combined \$1150/MWh penalty. The penalty for cutting the import leg of self-scheduled PT wheels and non-wheel imports would be \$400. The penalty price for load and the export leg of PT wheels would be \$1450. These changes would reduce the priority of LPT wheels to a lower level than both PT wheels and serving native load. The optimization would therefore consider the combination of cutting a self-scheduled import and curtailing load more costly than cutting a self-scheduled LPT wheel-through transaction.²⁰ We believe this is consistent with the treatment of non-firm transmission rights by other BAs.

This change provides more security for native load in the CAISO BA to use the transmission system to deliver the output of network resources to load by eliminating the previous priority that *all* day-ahead wheel-through self-schedules enjoyed over native load for use of the CAISO’s transmission. Note that the changes to the LPT wheeling penalty does not guarantee that all imports serving native load would receive a higher priority than even LPT wheel-through transactions. Economically-bid import transactions would likely be offered at prices above \$300 during stressed system conditions and therefore would be displaced in the market software by a self-scheduled LPT wheel-through.²¹ This change does, however, create a mechanism for California LSEs/RA importers to prioritize import transactions serving ISO load by self-scheduling import energy, or bidding its import at prices below \$300.

The core problem that would require longer run changes in the CAISO scarcity pricing design is that the \$1000 price cap limits the LMP-based congestion cost of wheel-throughs during extreme operating conditions. The demand for wheeling transactions could exceed the CAISO’s entire transfer capacity if the price differential between Pacific Northwest hubs and southwestern hubs exceeds the maximum potential congestion cost of the wheel in the CAISO. The only way to balance the available capacity with the demand for wheels would be to allow the transmission costs of those wheels to rise to the level of the financial benefits of those wheels.

an import that results in cutting load is $450+1450 = \$1900$ and the cost of curtailing a self-scheduled wheel is $650+1450 = \$2100$.

¹⁹ *Final Proposal*, p. 21.

²⁰ *Final Proposal. Appendices*, p. 44

²¹ Since the penalty for not meeting load is \$1450 and the penalty for a LPT wheel is \$1150, the optimization would interpret the net benefit of an import preventing load shed as the difference between \$1450 and the supply cost of that import. If the import price is above \$300, this net benefit will be lower than the “cost” of cutting the LPT wheel.

Wheeling transactions that are designated as PT wheels would maintain the same combined penalty level, and would have the same implied curtailment penalty of \$1850 (1450 + 400) in the IFM scheduling pass as an import that is self-scheduled to meet native load if the market software does not clear at the price cap. These transactions would therefore receive a priority commensurate with imported RA intended to serve California load.

Ideally the total available transmission capacity that could be potentially assigned to PT wheels would be limited to the network capacity available after accounting for the RA transmission needs of CAISO LSE's. However, there is not currently a system in place that reconciles the transmission accounting in the CAISOs Maximum Import Capability (MIC) used for import RA and the Congestion Revenue Right (CRR) allocation process with other measures of available transmission capacity.²² It is therefore not currently practical to calculate the transmission capacity that could be reliably marketed for wheel-through transactions on a forward basis, although one ad-hoc approach could simply limit available capacity to the difference between current capacity and the amount needed to accommodate RA imports.

In recognition of the fact that some outside BAs may have made forward arrangements for summer 2021 supply before the above changes were proposed, the CAISO is proposing for this summer to link PT wheeling status to purchases of firm transmission in neighboring BAs. The proposal would require a scheduling coordinator to notify the CAISO 45 days in advance of the MW quantity of the wheel and provide evidence of supporting the purchase of firm transmission capacity from the BAs supporting the import and the export of the wheel. This requirement for firm transmission capacity will restrict the ability of wheeling parties to submit inflated PT wheel-through schedules when they expect their schedules to be prorated down since firm transmission up to the CAISO's border is limited and costly. If the import RA contracts entered into by CAISO LSEs were also combined with firm transmission, then the PT wheel requirement would ensure that the combined capacity of PT wheels and RA imports were physically able to reach the CAISOs borders. However, firm transmission is not a requirement for an RA showing in California, so LSEs may not have procured it. Therefore, it is possible that even with these restrictions the combined capacity of PT Wheeling transactions and RA imports could exceed total transfer capability on a given intertie.

When running its day-ahead market, the CAISO will grant equal priority to wheel-through transactions and self-scheduled imports needed to meet native load. Not all RA imports would be expected to self-schedule, however.²³ At least some imports and all internal RA resources

²² The Maximum Import Capability (MIC) is used to determine the amount of maximum amount of import capacity that can reliably be depended upon to support resource adequacy imports.

²³ A CPUC decision from June 2020 requires that non-resource specific RA imports either self-schedule or offer at a negative or zero price. However, such requirements apply only to non-resource specific resources, and only during availability assessment hours (AAH). While the availability assessment hours are likely to be the hours with import constraints during load shedding conditions, this is not guaranteed. Moreover, these rules do not apply to dynamically scheduled and pseudo-tied RA imports, which we understand will also compete with wheel-through transactions for capacity on congested interties (PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA, DECISION ADOPTING RESOURCE ADEQUACY IMPORT REQUIREMENTS, D.20-06-028, in Rulemaking 17-09-020, <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M342/K516/342516267.PDF>).

would be expected to offer at prices reflecting their costs. In order to provide equal priority for California RA resources, the proposal would modify the Residual Unit Commitment (RUC) process so that all RA resources receive a RUC schedule when RUC is unable to meet the CAISO load forecast, even if the RA resource did not clear in RUC.²⁴ This adjustment is proposed to ensure that all RA units receive a priority equivalent to PT wheels when RUC is infeasible (and therefore in a scarcity condition).

With these changes, the intertie transmission capacity needed to accommodate the combination of import schedules, PT wheels, and RA schedules all emerging from RUC could exceed the capacity available in the Hour Ahead Scheduling Process (HASP). In such cases the proposal will apply a pro-rata adjustment after the HASP process that would allocate limited transmission capacity proportionately to the levels of PT Wheels and RA imports that were scheduled in RUC, where, again, RUC schedules may include RA resources that did not clear the original RUC solution.²⁵

The proposal would also apply the same pro-rata rationing approach to the internal north to south Path 26 constraint. This would reduce the likelihood that wheel-through transactions might prevent northern California RA resources from supplying southern California load.

As we understand it, internal RA resources in northern California as well as imports and wheeling transactions would all factor into this allocation, although we agree with commenters that more detail on how this would be implemented should be provided.

Stakeholders are divided on the wheeling issue along two lines. Comments from many BAs argue that the requirements to qualify for PT wheeling status are stricter than those applied to the RA contracts signed by California LSEs.²⁶ They argue that such differences constitute violations of non-discriminatory open-access principles.²⁷ Comments from California stakeholders point to the fact that no long-term purchase or payment of CAISO transmission is required to qualify for PT wheel status and argue that this, combined with other dimensions of the proposal, grant what

²⁴ Final Proposal, p. 44. Such a circumstance could arise if congestion prevents an RA import or unit from being chosen in the RUC solution.

²⁵ An update to the proposal limits the pro-ration to only PT Wheels and RA imports, rather than the higher of RUC imports and RA imports. This change was made to reflect a comparable priority status between RA import needs and PT Wheels.

²⁶ Powerex, for example, highlights the PT wheel requirements for firm transmission, energy contracts, and other elements that are not required of RA contracts. <https://powerex.com/sites/default/files/2021-04/2021-04-02%20Powerex%20Comments%20on%20CAISO%20Summer%20Readiness%20-%20Wheeling%20Priorities.pdf>. The most recent revision removes the requirements for an energy contract and the April 23, 2021 deadline for those contracts.

²⁷ See March 2021 comments by BPA, Portland General Electric Co., NV Energy, Powerex, Seattle City Light, Southwest Load Serving Entities, and the Western Power Trading Forum. <https://stakeholdercenter.caiso.com/Comments/AllComments/10a75479-324d-491f-b688-16d98711e742#org-236e0c64-cb5a-41c9-9e54-265368bb04f7>

is effectively firm access to use CAISO transmission to wheel power through the CAISO on more generous terms than could be found elsewhere in the WECC.²⁸

The fundamental issue at the root of these disagreements is whether open access principles require that transmission providers make all of their transmission capability for sale or only require that it market the available transmission capability in excess of the transmission needed to meet network load from designated resources. This is somewhat distinct from the transition issues discussed above, which could justify additional accommodation of wheeling arrangements on a transitional basis. On these points we largely agree with the perspective of CAISO DMM that the CAISO's proposed solution still grants access to the CAISO transmission system on terms that are more "open" than those typically found outside the CAISO. Our understanding of the principle of open-access is that it recognizes that transmission owners have a right and obligation to reserve the network capacity needed serve their own retail load as part of its existing transmission commitments (ETC), and that non-discriminatory access must be provided for any transmission capacity that is available *after* accounting for these local reliability needs (ATC).²⁹ Access truly comparable to what some BAs are requesting of the CAISO would require that those BAs market *all* of their transmission capacity on a daily basis and treat those transactions with the same priority as their own load. This is clearly not the standard practice outside of CAISO. The CAISO, unlike other BAs, is proposing to provide high priority wheeling access without requiring a long-term commitment to pay for a higher level of firm access. Even the least "firm" of wheeling transactions, low-priority wheels scheduled in real-time could still crowd out real-time imports to serve CAISO load if those imports are priced above \$400. Thus, CAISO load may have to be curtailed in order to accommodate real-time low priority wheeling transactions.

The fact that wheel-through transactions might have to demonstrate commitments (such as firm transmission purchases) reflecting an intent to rely on firm transmission through the CAISO that are different than the entitlement of CAISO load to use the transmission system to deliver power from designated (external RA) resources to load does not strike us as particularly relevant. To our knowledge, other western BAs are not required to align their procurement practices to serve their native load with those of firms purchasing transmission service on their systems. What is relevant is whether the *magnitude* of RA requirements, and their related transmission needs, are a reasonable interim measure of native load transmission requirements.

It is notable that external parties already need to meet a different set of criteria than internal LSEs in order to qualify for the allocation of CRRs, the main form of transmission rights currently in place in the CAISO system.³⁰ These requirements, including prepayment, or a

²⁸ See March 2021 comments by PG&E, SCE and the California Public Utilities Commission. <https://stakeholdercenter.caiso.com/Comments/AllComments/10a75479-324d-491f-b688-16d98711e742#org-236e0c64-cb5a-41c9-9e54-265368bb04f7>

³⁰ See section 36.9 of the CAISO tariff at <http://www.caiso.com/Documents/Section36-CongestionRevenueRights-asof-Aug12-2019.pdf>

commitment to pay, the wheeling access charge in the amount of MWs of CRRs nominated, are more extensive than those being proposed for qualification for PT Wheeling access.

The conditions for PT wheel status have been proposed as an ad-hoc method of identifying existing needs for firm wheel-through transactions, in the absence of any purchase of firm transmission service by those seeking to use the CAISO transmission system on a firm basis. It is a short-term measure intended to accommodate neighboring BAs who have been relying upon access to the CAISO system for their reliability needs this coming summer. While the CAISO should do everything within reason to accommodate these needs, it also needs to balance those needs with those of its own internal load. The proposed method would enable third-party use of the CAISO transmission system while hopefully maintaining the CAISO's ability to use its transmission system to meet network load using its designated capacity resources. While the CAISO has not explicitly calculated ATC on each tie taking into account RA import entitlements and a capacity benefit margin, retaining capacity to deliver power from designated capacity resources to meet network load is a very conservative definition of the highest priority entitlement to use of the transmission system, as noted by Morgan Stanley in their comments. California's RA requirements are a minimal measure of the entitlement of CAISO load to the use of the CAISO transmission system. Therefore, practices that try to ensure that resources designated for RA purposes can reach CAISO load should be viewed as attempting to honor existing transmission commitments, not as discriminating against wholesale transactions.

5. Summary

Prior to August 2020, the CAISO market's scheduling protocols and policy parameters treated exports and wheeling transactions with equal or higher priority. In several dimensions therefore the CAISO design went farther to accommodate market transactions at the expense of local reliability than neighboring BAs. The changes in August and proposed here recalibrate those priorities and swing the priority pendulum more toward CAISO short-term reliability. No export or wheeling transaction will be given higher priority to California load, but exports and wheels associated with contracts with neighboring areas will be given equal priority. These changes do not guarantee that energy from CAISO RA capacity could not be exported, but make it substantially less likely. California LSEs can increase the priority of CAISO load by clearing their expected load in the day-ahead market, but in the absence of more effective scarcity pricing, the benefits from doing so accrue to all CAISO LSEs while the costs fall on the LSEs that fully schedule their load.

While the treatment of some exports, particularly those backed by long-term RA arrangements with external BAs, is arguably less generous than the stated practice of other western BAs, by giving such resources equal priority to load, the proposals treatment is not dramatically less generous. Access to CAISO's transmission network would continue in many ways to be more generous and open than that found in other western BAs. Even with the proposed changes, the amount of high-priority wheeling transactions allowed this summer, combined with the capacity needed for RA imports, could exceed the CAISOs transfer capability during some periods. High priority wheels will gain the equivalent of firm access under "pay as you go" terms. To the extent that the capacity of qualifying PT Wheels exceeds what an objective measure of available

transmission capacity would have made available for sale, the CAISO will have gone beyond its obligations under open access principles.

Although the CAISO's proposal appears to be the only feasible approach for this summer, longer-term solutions will need to more precisely assess the amount of available transmission capacity that can be made available for PT wheels without degrading CAISO system reliability. This is one of the stated goals of the ISO's new Maximum Import Capability initiative.³¹ Another question that will have to be confronted in this process is the degree to which the CAISO model of transmission access should be shaped to fit the norms and practices of other BAs.

We believe there are significant efficiency and transparency benefits from the general ISO/LMP model of transmission pricing and that these should be maintained as much as possible. Under this model, physical access to transmission is cleared by a short-term market and transmission rights are financial rather than physical. These financial transmission rights (e.g., CRRs) provide the financial hedge that allows the owners of these rights to "outbid" their competitors for transmission if necessary and desirable. This model breaks down, however, when the hypothetical market clearing price for transmission rises above the levels constrained by price caps. To the extent that scarcity prices across the western BAs are more aligned with each other in the future, the competition between wheeling and import transactions could be resolved by congestion pricing, rather than by the penalty values assigned to different forms of transactions.

³¹<https://stakeholdercenter.caiso.com/StakeholderInitiatives/Maximum-import-capability-enhancements>