Day-Ahead Market Enhancements and Extended Day Ahead Market Business Practice Summary

Version 1

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1. Introduction

Welcome to the ISO *Business Practice* Summary for Day-Ahead Market Enhancements In this Introduction you will find the following information:

- > The purpose of ISO Business Practice Summary
- What you can expect from this ISO BPS
- > Other ISO BPMs or documents that provide related or additional information

1.1 Purpose of ISO Business Practice Summary

The Business Practice Summary is intended to introduce participants to upcoming requirements for the project prior to its implementation.

1.2 Purpose of this Business Practice Summary

This Business Practice Summary covers the rules, design, and operational elements of the ISO Markets. The Business Practice Summary is intended for those entities that expect to participate in the ISO Markets, as well as those entities that expect to exchange Power with the ISO Balancing Authority Area.

This BPM benefits readers who want answers to the following questions:

- > What are the roles of the ISO and the Scheduling Coordinators in the ISO Markets?
- > What are the concepts that an entity needs to understand to engage in the ISO Markets?
- What does a Market Participant need to do to participate in the ISO Markets?
- What are the market objectives, inputs, and outcomes?

The provisions of this Business Practice Summary are intended to be consistent with the ISO Tariff. If the provisions of this Business Practice Summary nevertheless conflict with the ISO Tariff, the ISO is bound to operate in accordance with the ISO Tariff. Any provision of the ISO Tariff that may have been summarized or repeated in this Business Practice Summary is only to aid understanding.

A reference in this Business Practice Summary to the ISO Tariff, a given agreement, any BPM or instrument, is intended to refer to the ISO Tariff, that agreement, BPM or instrument as modified, amended, supplemented or restated.

The captions and headings in this Business Practice Summary are intended solely to facilitate reference and not to have any bearing on the meaning of any of the terms and conditions of this BPM.

1.3 References

The definition of acronyms and words beginning with capitalized letters are given in the *BPM for Definitions & Acronyms.*

Other reference information related to this Business Practice Summary includes:

- > ISO BPMs
 - Market Instruments
- ISO Tariff

2. Extended Day Ahead Market

Welcome to the *EDAM* Business Practice Summary section of the ISO Business Practice Summary *for EDAM*. In this section, you will find the following information:

2.1 MF GRDT impact

• RESOURCE tab – Modifiable data

RDT Column Name	Unit	Definition	
CERT_RSE	Y/N	Certified for Resource Sufficiency Evaluation	Default setting is N

• GHG_EMISSION_RATE tab – Modifiable data

RDT Column Name	Unit	Definition	
GHG Pseudo Tie	Y/Null	Indicator of a resource that is outside of a GHG area and fully serving load for a GHG regulation area.	Default setting is Null. Y means the resource is a GHG pseudo tie for the corresponding state.

• GHG_CONTRACT tab – Modifiable data

RDT Column Name	Unit	Definition	
GHG Regulation text Area		The jurisdictional state for the GHG compliance obligation. Options are California (CA) and Washington (WA).	
GHG Contractual MW Capacity		The maximum capacity the generator is contracted to serve the load in the GHG regulation area.	Total GHG contractual capacity of a generator cannot exceed its Pmax.

2.2 Net Export Constraints

Background on EDAM net export transfer constraint

The EDAM net export transfer constraint is an optional reliability tool available to all EDAM participating BAAs. The constraint is designed to allow each participating BAA to manage the amount of supply that is

exported to support EDAM transfers. It therefore gives BAAs the ability to mitigate potential reliability concerns that may arise between the day-ahead and real-time. The constraint is an hourly mechanism that limits the amount of excess supply (i.e., bid-in supply exceeding the BAA's RSE obligations) that is available to support EDAM export transfers, net of EDAM import transfers.

As shown in the equation directly below, the amount of supply reserved can be adjusted by the "EDAM reliability margin." In addition, an optional "confidence factor" can be used to account for the delivery risk associated with the portion of offered supply that is not eligible for the RSE, but may be used to facilitate EDAM export transfers.

EDAM net export transfer constraint:¹

```
\label{eq:linear} \begin{split} \textit{Net Export} &\leq (\textit{RSE Eligible Supply} + \textit{Non RSE Eligible Supply x Confidence Factor}) \\ -\textit{RSE Obligation} - \textit{EDAM Reliability Margin} \end{split}
```

Where:

- *RSE Eligible Supply* = supply that is eligible to satisfy the EDAM RSE.
- Non RSE Eligible Supply = supply that is ineligible to count toward the EDAM RSE. For the CAISO BAA, intertie bids from supply not under contract are ineligible RSE supply.
- *Confidence Factor* = an optional factor that accounts for confidence in delivery associated with a portion of the Non RSE Eligible Supply. For example, in the CAISO BAA the confidence factor could be used to adjust for the risk of untagged intertie day-ahead schedules.
- *RSE Obligation* = the EDAM RSE requirements, including the BAA demand forecast, imbalance reserve requirements, and the ancillary services requirements. The RSE requirements for the CAISO BAA will include obligations associated with high priority exports to non-EDAM BAAs.
- *EDAM Reliability Margin* = represents an additional amount of capacity established by the EDAM BAA to tighten the limit on the BAA's net export transfer, if necessary, in limited conditions.

The net EDAM export transfer constraint cannot be negative or set at a level below the shown bucket 1 transfers out of an EDAM BAA. If an EDAM entity relies on exports to meet the RSE from the EDAM BAA imposing the net export transfer constraint, the EDAM BAA sourcing the supply cannot reduce the net export transfer below the export committed to the receiving EDAM BAA's RSE.

CAISO BAA's use of EDAM net export transfer constraint

In the CAISO BAA, resource adequacy supply is largely obligated to submit day-ahead offers through a must offer obligation. Total day-ahead supply offers may exceed the CAISO BAA's EDAM RSE requirements. The EDAM net export transfer constraint will help mitigate the risk that this excess supply

¹ The mathematical formulation of the EDAM net export transfer constraint can be found in Appendix 4 of the EDAM Final Proposal: <u>http://www.caiso.com/InitiativeDocuments/FinalProposal-ExtendedDay-AheadMarket.pdf</u>

will be committed economically to support EDAM transfers and will protect the RA supply that is available to help respond to potential ISO BAA reliability events.

For the CAISO BAA, the net EDAM export transfer constraint will always be enabled, however its inputs will vary depending on expected operating conditions. The CAISO BAA will distinguish between "stressed hours" and "non-stressed hours." CAISO BAA system operators will have until 10am each morning to finalize the identification of stressed vs. non-stressed hours and to accordingly set the reliability margins and confidence factors.

CAISO BAA definition of stressed hours

Any hour that meets one of the following conditions, as determined by CAISO BAA system operations before the day-ahead market closes at 10am.

- For summer months: net-load peak hours; defined as hour-ending 17 through hour-ending 21 (i.e., 4pm-9pm)
- Operational RA capacity + RA credits < demand forecast + contingency reserve requirement + regulation reserve + imbalance reserve upward requirement.
- Operational net RA capacity + RA credits < net demand forecast + contingency reserve requirement + regulation reserve + imbalance reserve upward requirement.
- Advisory RSE upward failure quantity expected day-ahead offers not yet submitted by available RA resources with day-ahead must offer obligations > 0
- Restricted Maintenance Operations
- Wide-area Transmission Emergency
- D+2 RUC infeasibility
- EEA Watch, if called before the day-ahead market closes at 10am
- Flex Alert, if called before the day-ahead market closes at 10am

2.3 Setting Reliability Margin

CAISO BAA: setting the reliability margin:

The CAISO BAA will set the reliability margin to protect for a) reliability needs for which there isn't an explicit market product, or b) intra-day changes that can occur between the day ahead and real time markets.

The CAISO BAA will differentiate between stressed and non-stressed hours, providing CAISO BAA system operators discretion in how they will set the reliability margin. During stressed hours the reliability margin will be set by taking, at a minimum, the max of the two criteria listed below. At the discretion of the CAISO BAA system operators the reliability margin can be set above the maximum of the two criteria, as these two criteria are not mutually exclusive (i.e., the underlying reliability risks may not occur in isolation). This treatment is appropriate as it ensures that a minimum level of reliability, defined by agreed-upon criteria, is maintained. During non-stressed conditions the reliability margin will be determined by CAISO BAA system operators.

- Stressed hours: hourly default values calculated by taking, at a minimum, the max of:
 - 1. Replacement reserves based on forecasted most severe single contingency: the dayahead market does not have an explicit product to reserve unloaded flexible capacity to ensure the ISO BAA is able to replace its contingency reserves within NERC required timelines²
 - 2. Protection for a non-credible contingency³: Intraday conditions may change, rendering nominally non-credible contingencies as credible. Reservation of RA capacity allows for activation of the non-credible contingency within the real-time market's security constrained dispatch, ensuring the real-time market dispatch is security constrained.
- Non-Stressed hours: CAISO BAA system operator discretion

The reliability margin for CAISO and all EDAM entities will be published on OASIS. For additional details see the market instruments BPM.

The stressed hour determination for the CAISO will be published on OASIS.

WECC-0115 BAL-002-WECC-3 - Contingency Reserve - Exhibit A - Final Standard - Clean (nerc.com)

² As a participating BAA within the WECC the ISO is required to maintain a minimum amount of Contingency Reserves, except within the first sixty minutes following an event requiring the activation of the Contingency Reserves. The CAISO currently procures Contingency Reserves within its day-ahead market, but does not explicitly procure flexible capacity to ensure it is able to recover these reserves within 60 minutes following deployment. While the ISO's proposal to include this quantity in the reliability margin does not guarantee the ability to recover reserves, it does ensure that capacity in excess of the EDAM RSE requirement is not used to support EDAM transfers rending it completely unavailable to recover reserves.

³ Non-credible contingencies can be based on weather conditions (fires) or potential impacts to fuel availability (gas operational flow order /curtailments can lead to a reduction in generation capacity that significantly exceeds the most severe single contingency that is protected)

2.4 Setting Confidence Factor

CAISO BAA: setting the confidence factor:

The day-ahead market process considers all available supply offers, including economic import offers, in its security constrained optimization. Economic import offers made at CAISO BAA scheduling points that receive a financial day-ahead award to serve CAISO BAA demand may result in facilitating either a) EDAM export transfers from the CAISO BAA or, b) LPT⁴ exports from the CAISO BAA. During periods of supply insufficiency, EDAM transfers are afforded a priority equal to CAISO BAA load, as compared to LPT exports that are curtailed prior to CAISO load. The equal priory of EDAM transfers that may have been awarded due to economic import offers exposes the CAISO BAA demand to increased reliability risk during occurrences of non-delivery.

The confidence factor is intended to address this issue. Upon inception of the EDAM the CAISO BAA will utilize a confidence factor of 0%⁵ during all system conditions. This will ensure that the CAISO BAA is not assuming any incremental risk associated with the non-delivery of economy energy intertie supply.

- <u>Stressed hours</u>: 0%
- <u>Non-Stressed hours</u>: 0%

The Confidence factor <u>CAISO will be published on OASIS. For additional details see the market</u> instruments BPM.

2.5 RUC Net Short

Use of RUC net short for EDAM participants has not been determined yet.

2.6 Transmission Constraint Activation

Based on historic power flow patterns and transmission and generation availability, the EDAM entities including the CAISO may activate or deactivate transmission constraints via an OMS outage record. Transmission constraints include flowgates and/or contingencies as defined in the MasterFile. The OMS

⁴ CAISO Tariff Section 34.12.1

⁵ A confidence factor of zero does not preclude import bids associated with bucket 1 transfers between the CAISO and an EDAM BAA partners for being exported out of the CAISO BAA in within the optimal market solution.

record must be received and approved prior to 09:00. See Market Operations BPM Section 6.6.2.5 for more information on the enforcement of constraints.

2.7 Minimum Online Commitment (MOC) Constraint

The MOC constraint capability in IFM is designed to address the operational needs of operating procedures that require a minimum quantity of committed online resources in order to maintain reliability in a defined area. This required minimum online commitment does not reflect a minimum energy production or an amount of 10 minute operating reserve. Rather these requirements are described in terms of a minimum set of online resources, by name or by total quantity of operating capability based on the resources Maximum Operating level (Pmax) or an effective MW equivalent based on the units VAR support and/or location. However, the same set of resources committed in IFM to satisfy the minimum online constraint could also be ready for dispatch or be awarded ancillary services in the market co-optimization. Use of the MOC constraint for EDAM entities has not been determined yet. See Market Operations BPM Section 6.6.2.4 for more information on MOCs.

2.8 Market Parameter Values

See Section 6.6.5 in the Market Operations BPM that 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 parameters in these tables are also known in the terminology 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. Any market parameter change of operational impact shall be communicated by the DA operator via a Market Notice or MNS.

2.9 EDAM Outputs (copied from MO 6.6.6)

The following IFM output information is produced and is financially and operationally binding:

- > Optimal Unit Commitment status (on/off) over the Time Horizon
- > Type of Unit Commitment status (self-commitment and CAISO-commitment)
- > Optimal Energy Schedule for all resources over the Time Horizon
- Virtual Supply and Virtual Demand Awards
- > Optimal AS Award for all resources over the Time Horizon
- > The total Energy and AS Bid Cost over the Time Horizon
- The Start-Up Cost (\$) for each Generation resource or minimum curtailment payment (\$) for each dispatchable Demand/Curtailable Demand resource during each CAISO-commitment period
- The Minimum Load Cost (\$) for each Generation resource or minimum hourly payment (\$) in each hour during each CAISO-commitment period
- The Start-Up Cost/Bid function (\$, Minute) or minimum curtailment payment (\$) used for each resource in each CAISO-Commitment Period.
- LMPs for each price Location including all resources; also LMP components (Energy, Marginal Loss, and Congestion components)
- RASMP for each AS Region
- > ASMP for all resources providing Ancillary Services.
- > Resources at their effective minimum or maximum MW in each time interval
- The level of control and Constraint priority used in obtaining the solution. This informs the CAISO's operator as to how much of uneconomic Bid segments and/or Constraint violations were necessary to solve the optimization.
- Amount of any relaxed constraint violations, i.e., the extent to which any constraint was relaxed (in MW) in order to solve the optimization.

Both schedules and prices are derived from the pricing run of the IFM market to ensure consistency between schedules and prices. This consistency is important for prices that are financially binding to settle energy schedules.

2.10 RSE

The day-ahead sufficiency initiative focuses on an important element of EDAM design, the resource sufficiency evaluation (RSE). The RSE is intended to motivate BAAs participating in EDAM to come to the market with sufficient supply to meet their next-day obligations, prior to engaging in transfers with other participating BAAs. By requiring each participating BAA to demonstrate sufficient forward procured supply each day, the EDAM RSE discourages BAAs with insufficient resources from inappropriately leaning on neighboring BAAs.

As established in the EDAM design, the RSE will be conducted each day at 10 a.m., prior to running the day-ahead market. The RSE will evaluate each BAA's offered supply^[2] against its demand forecast, imbalance reserve requirements^[3] and ancillary services requirements across the 24 hourly intervals of the day-ahead market.^[4] To perform the evaluation, the RSE application will model each BAA's entire load and supply on a single bus (i.e., without transmission constraints) and perform a unit commitment optimization. If the optimization does not relax constraints in order to solve, then the BAA "passes" the RSE. If the optimization is required to relax constraints in order to solve, then the BAA "fails" the RSE. Failures can be in the upward and/or downward direction. An upward failure occurs when the optimization must relax the upward power balance constraint. A downward failure occurs when the optimization must relax the downward power balance constraint, downward imbalance reserve procurement constraint and/or downward ancillary services procurement constraint. The optimization

^[2] For variable energy resources (VERs), the RSE will take into account the full VER forecast. See EDAM Tariff Section 33.31.1.

^[3] Imbalance reserves are a new day-ahead market product that the CAISO will implement as part of its <u>day-ahead market</u> <u>enhancements initiative</u>. When implemented, the day-ahead market will procure imbalance reserves up and imbalance reserves down to meet the range of expected imbalances between the day-ahead and real-time net load forecasts.

^[4] For the CAISO BAA, RSE obligations will also include any self-scheduled volumes of high priority exports to non-EDAM BAAs. For the CAISO BAA, RSE-eligible supply will include forward-contracted intertie resources, pseudo-tie resources and all CAISO-BAA located resources, unless contracted to a non-CAISO EDAM BAA through an EDAM bucket 1 transfer.

will seek to minimize the sum of the constraint relaxation quantities across the 24 intervals. Figure 1 illustrates the RSE process, applied to the CAISO BA.

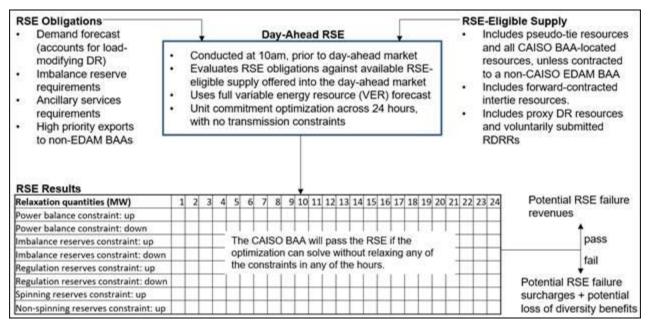


Figure 1: RSE Applied to CAISO BAA

BAAs that fail the RSE in any hour of the 24 hour evaluation may incur at least one of the following types of financial surcharges: (1) on-peak upward failure surcharges; (2) off-peak upward failure surcharges; (3) downward failure surcharges. BAAs that fail the RSE by a *de minimis* amount will not be subject to financial surcharges. Upward failure surcharges are calculated on a tiered structure that incorporates the magnitude of the failure and any persistence in upward failures over a rolling thirty-day period. The downward failure surcharge is not tiered. In addition to incurring financial surcharges, deficient BAAs may be removed from the pool of passing entities and may lose diversity benefits in real-time. More specifically, BAAs that are deficient after the integrated forward market (IFM),^[5] or otherwise fail to comply with the tagging requirements, will be evaluated individually in the western energy imbalance

^[5] The integrated forward market (IFM) is the engine of the day-ahead market. It is a financial market where bid-in supply clears against bid-in load and ancillary service requirements. The IFM co-optimizes procurement of energy and ancillary services for each operating hour of the trading day seeking to minimize overall procurement costs, while respecting transmission constraints and inter-temporal resource constraints such as minimum run time and start-up time. Beginning in the spring of 2026, the IFM will also procure and co-optimize imbalance reserves, as detailed in the CAISO's <u>day-ahead market</u> <u>enhancements initiative</u>.

market (WEIM) RSE. BAAs that are sufficient and comply with the tagging requirements will be pooled together and evaluated as a whole.

As an EDAM participating BAA, the CAISO needs to establish a process to evaluate actions to meet its RSE obligations at or before 10 a.m. each morning. As part of this process, the CAISO BA must be able to quantify its RSE position with enough time to take action if there is a projected shortfall. The best opportunity for the CAISO BA to quantify its RSE position is at approximately 9 a.m., when its demand forecast, variable energy resource forecasts and reserve requirements are final, a significant portion of day-ahead supply offers have been submitted, and advisory RSE results are published. If there is a projected RSE shortfall at 9 a.m., the CAISO BA will still have approximately one hour to take action to attempt to cure any projected failures.

To quantify its 9 a.m. RSE position, the CAISO BA will first examine its 9 a.m. advisory RSE results. As established in the EDAM design, the advisory RSEs are non-binding RSE runs that participating BAAs can access before 10 a.m. For each BAA, the advisory RSE results will show whether the BAA can meet its energy, imbalance reserve and ancillary services requirements. The results will show whether the BAA is deficient in the upward and/or downward direction for each of the 24 intervals of the day-ahead market as well as the magnitude of any projected failures. An upward deficiency means the BAA has not provided sufficient RSE-eligible supply to meet its upward energy requirements, upward imbalance reserve requirements and/or upward ancillary services requirements. A downward deficiency means the BAA has not provided sufficient RSE-eligible supply to meet its downward energy requirements, downward imbalance reserve requirements and/or downward ancillary services requirements.

At 9 a.m. each day, the CAISO BA will use its advisory RSE results and determine gross upward shortfalls by adding the upward deficiencies, if any, in each hour. The upward deficiencies will consist of the

^[6] For example, during over-supply conditions when imbalance reserve down requirements cannot be met due to a high volume of self-schedules.

relaxation quantities for the upward power balance constraint, upward imbalance reserve procurement constraint and upward ancillary services procurement constraints.^[7]

The advisory RSE results provide a starting point to quantify the CAISO BAA's 9 a.m. RSE position, but they may not accurately represent all RSE-eligible supply that will become available to the CAISO BA. That is because the advisory results will not reflect volumes associated with offers submitted into the day-ahead market after 9 a.m. For the CAISO BA, such volumes may be significant. CAISO load-serving entities are required to procure forward capacity, called resource adequacy (RA) capacity, and demonstrate such capacity to the CAISO in year-ahead and month-ahead RA compliance filings.^[8] The majority of this shown RA capacity must then be offered into the day-ahead market by 10 a.m.^[9] For this reason, the 9 a.m. advisory RSE results may fail to reflect significant volumes associated with day-ahead supply offers that are expected and required by 10 a.m.

To the extent market participants are able to voluntarily submit day-ahead offers by 9 a.m the assessment will increase in accuracy. This would not prevent scheduling coordinators from further updating their offers until 10 a.m. market close. To the extent these offers are not present at 9.am. the CAISO BA will need to take remedial actions in increase the accuracy of the evaluation.

The CAISO encourages (but does not require) resource scheduling coordinators to submit all day-ahead offers by 9 a.m. To the extent this can be done, it will improve the accuracy of the 9 a.m. advisory RSE. Importantly, scheduling coordinators will be able to modify these day-ahead offers until 10 a.m.

^[7] For the purpose of calculating a 9 a.m. RSE position, it is reasonable to take the sum of these relaxation quantities and treat energy, imbalance reserves and ancillary services interchangeably. It is reasonable to treat these RSE obligations interchangeably, because the awarded supply for one type of obligation will likely free up supply for another type of obligation in the co-optimization.

^[8] The CAISO's resource adequacy tariff provisions require load serving entities in the CAISO BAA to submit a year-ahead forward showing and month-ahead showings of the capacity procured to meet their share of the peak load plus any applicable reserve margin, as well as local and flexible capacity requirements.

^[9] There are exemptions to the RA day-ahead must offer obligations. For example, variable energy resources are not required to submit day-ahead offers.

Second, for RA resources that <u>are</u> subject to bid-insertion^[11], the CAISO will estimate the offers based upon the RA bid insertion rules.

Third, for RA resources that <u>are not</u> subject to bid-insertion, the CAISO will also estimate offers based upon historical or best information available. Examples of RA resources that fall into this category are use-limited gas resources, hydroelectric resources, proxy demand response resources and nongenerator resources (NGRs), including hybrid resources.^[14] Estimated bids will not be visible to EDAM participants in SIBR. The estimations are used for operational purposes only in the consideration of solving RSE failures. However, the RSE results will reflect bid estimations at 9am.

2.11 RDRR

Reliability demand response resources (RDRRs) are a unique type of RA supply, available for use by the CAISO BA during an Energy Emergency Alert (EEA) Watch or higher.^[15] Investor-owned utilities overseen by the California Public Utilities Commission manage RDRRs, which consist mainly of base interruptible program customers and agricultural and pumping loads. RDRRs are supply-side resources and therefore are not reflected in the CAISO BAA's demand forecast.

In the CAISO BA, RDRR capacity is not shown on RA supply plans but instead is credited as RA supply to the applicable load-serving entities. RDRRs may voluntarily submit offers into the CAISO's day-ahead market, but they are not required to do so. RDRRs are required to submit real-time offers, but such offers may only be released into the CAISO's real-time market in conjunction with a transmission emergency, energy emergency alert (EEA) watch or other EEA notice.

^[11] For more information on which specific resource types are subject to RA bid-insertion rules, please refer to table 7.1.1 in the reliability requirements business practice manual.

^[14] For a detailed list of which specific RA resource types are <u>not</u> subject to bid-insertion rules, please refer to table 7.1.1 in the reliability requirements business practice manual.

^[15] The RDRR participation model is available to other WEIM BAAs. This issue paper discusses how the ISO BAA will use the California RA RDRR in its RSE.

Should the CAISO BAA expect an upward RSE failure in a particular interval, and if the CAISO BAA is forecasting that emergency conditions may materialize in real-time, then the CAISO BA could reduce its RSE obligation for that interval. More specifically, when emergency conditions are expected, the CAISO BAA could reduce its RSE obligation by an amount equal to the minimum of: (1) the expected upward shortfall as indicated by the 9 a.m. advisory RSE results, net of any upward volumes not reflected in the 9 a.m. advisory RSE but by 10 a.m.; (2) the quantity of available RDRR capacity that has not voluntarily submitted a day-ahead offer as of 9 a.m. This adjustment is appropriate because it would allow the CAISO BAA to account for RDRR capacity, which is a subset of RA capacity.^[16] Importantly, the adjustment would be limited to the available RDRR capacity that has not voluntarily submitted a day-ahead offer by 9 a.m. Any available RDRR capacity voluntarily offered into the day-ahead market by 9 a.m. would already be reflected as RSE-eligible supply. In addition, the CAISO BAA would only make this adjustment to the extent it expects emergency conditions to materialize based on its existing supply, absent any future market participation.

The CAISO will notify via MNS any decision to include RDRR capacity in the 9am RSE.

2.12 LMDR

There are two other types of demand response resources that should be considered in the context of day-ahead sufficiency. First, proxy demand response resources providing resource adequacy have a must-offer obligation into the day-ahead market, and the CAISO will count such day-ahead offers as RSE-eligible supply. Second, load-modifying demand response, where approved by the short-term forecast team, will be reflected as a reduction to the CAISO BAA day-ahead demand forecast when it has been scheduled in the pre-day-ahead time frame to physically curtail. An API interface shall be available for LMDR submissions.

^[16] This is also reflected in the EDAM design. *See* proposed EDAM tariff 33.31.4.1.

2.13 LSSRR

In 2022, Assembly Bill (AB) 205 was signed into California law and created a strategic reliability reserve (SRR) to support grid reliability during extreme events. A subset of the SRR in the Electricity Supply Strategic Reliability Reserve Program (ESSRRP) managed by the Department of Water Resources (DWR) is comprised of generation assets eligible to participate in the CAISO market. As shown in tables 1 and 2 below, the SRR is expected to include 2,886.8 MW of long-start resources and 263.5 MW of short-start market resources starting 2024. The reserve is currently funded until 2026.

Host BAA	Туре	Resource Name	Capacity (MW)
CAISO	Long-start	Channel Islands Power	27.50
CAISO	Short-start	Greenleaf 1	60.0
BANC	Short-start	Roseville Peakers TM2500	60.0

Table 1: Strategic reliability reserve resources (2023 program resources)

Table 2: Strategic reliability reserve resources (2024 additions)

Host BAA	Туре	Resource Name	Capacity (MW)
CAISO	Long-start	ALAMITOS GEN STA. UNIT 3	326.76
CAISO	Long-start	ALAMITOS GEN STA. UNIT 4	334.43
CAISO	Long-start	ALAMITOS GEN STA. UNIT 5	480
CAISO	Long-start	HUNTINGTON BEACH GEN STA. UNIT 2	226.84
CAISO	Long-start	ORMOND BEACH GEN STA. UNIT 1	741.27
CAISO	Long-start	ORMOND BEACH GEN STA. UNIT 2	750
CAISO	Short-start	Enchanted Rock – City of Lodi	48.0
BANC	Short-start	Enchanted Rock – MID	48.0
TID	Short-start	Enchanted Rock – TID	47.5

Long Start Strategic Reserves

All long-start SRR resources are currently located within the CAISO BAA.^[17] These long-start resources may be committed multiple days in advance of a forecasted extreme event warring grid support, to accommodate unit start-up times and to allow for unit testing in advance of an extreme event. If committed to minimum load, these resources are expected to submit day-ahead offers that are the same as minimum load commitment. Upon bidding, the long-start SRR resources will be counted as RSE-eligible supply for the CAISO BAA.^[19]

2.14 Short start SRR

Short-Start Strategic Reserves

The short-start SRR resources will not be committed before the day-ahead market and will not submit day-ahead offers, but instead may offer into the real-time market when the CAISO or other California BAs declare an EEA Watch or more severe EEA conditions. For this reason, short-start SRR resources will not be eligible for the day-ahead RSE. For purposes of the WEIM RSE the EDAM footprint will be tested as whole, allowing the sharing of short-start strategic reserves. By the EDAM design, a BA can be excluded from pooled approach in the WEIM^[20].

2.15 Curing RSE Shortfalls

The CAISO BAA will examine its RSE position each morning, starting at 6 a.m. and through the 9 a.m. advisory results. If the CAISO BAA expects an upward RSE shortfall based on these results, it will need to cure the anticipated shortfall in advance of the binding 10 a.m. RSE. Upon EDAM go-live, the CAISO BAA

^[17] Operating Procedure 4420 addresses both long-start and short-start SRR resources.

^[19] It is important to note that all of the long-start resources, with the exception of Channel Islands Power, are thermal power plants that rely on once-through cooling (OTC) technologies. These OTC plants must comply with State Water Resources Control Board OTC policy, which establishes standards to reduce the harmful effects associated with cooling water intake structures on marine and estuarine life. The OTC policy compliance dates for these particular resources have been extended from 12/31/2023 to 12/31/2026.

^[20] EDAM Final Proposal §II.B.2h

plans to use its existing exceptional dispatch authority to cure anticipated upward RSE shortfalls. The CAISO may also work with scheduling coordinators to potentially end generator outages early where possible. The CAISO does not plan to cure expected downward RSE shortfalls.

2.16 Tagging Day Ahead

As established in the EDAM design, EDAM BAAs that pass the day-ahead RSE will be grouped together and evaluated as a pool for the WEIM RSE.^[22] This is an important aspect of EDAM design, as it retains the diversity benefits for the BAAs that pass the day-ahead RSE. Grouped BAAs benefit significantly because their uncertainty requirements incorporate the diversity benefit. The diversity benefit reduces the overall reserve requirements, as the collective uncertainty is lower than the sum of individual uncertainties, enabling the grouped BAAs to procure fewer reserves.

EDAM BAAs that pass the day-ahead RSE must comply with tagging requirements in order to remain in the pool.^[23] As established by EDAM design, BAA scheduling coordinators will have until approximately 5 hours before the start of the operating hour to submit e-tags and/or replace the un-tagged capacity with other firm schedules or physical resources. BAAs that fail to comply with these tagging requirements will be removed from the pool, thereby losing potential diversity benefits. There may be legitimate instances when an import does not tag by the EDAM deadline. For this reason, the EDAM design allows BAA scheduling coordinators to replace the un-tagged capacity with other firm schedules or physical resources. This ability to re-supply is consistent with current industry and utility practice.^[24] Overall, the intent of the tagging requirement is to ensure the integrity of day-ahead RSE supply, especially when such supply includes non-resource specific intertie transactions.

^[22] EDAM final proposal, section II.B.2(h), page 76.

^[23] See proposed EDAM Tariff Section 33.31.1.6 (requiring compliance with the tagging protocols set forth in Section 33.30.8.3 and the Business Practice Manuals).

^[24] For example, a load serving entity relying on import supply, if not tagged by a certain timeframe, will take steps to procure additional supply in advance of the operating hour to ensure it can serve its load.

2.17 Outage Management

EDAM Transmission Participants will be able to use a feature in webOMS that will allow them to activate additional contingencies in EDAM for the duration of a particular transmission outage. The maximum number of contingencies activated at any point of time will be similar to the current number in WEIM.

They will also be able to enforce additional flow gates in DA market for the duration of their outages.

These new features will only be available in the webOMS UI in the Market Impact Tab and the current API will not be affected. The participants will be able to select their own constraints.

Definition of contingencies and flowgates are coming to webOMS from our EMMS model and they need to be defined in the model first before being available in webOMS.

The flowgates can only be added in the process of Full Network Model Promotion while new contingencies could be defined in between model promotions as well.

2.18 Market Disruption Process

The following describes the process for the CAISO Market Operator if during the execution of any market module (i.e., MPM, IFM, and RUC) a failure occurs requiring manual intervention. If a DAM module fails and is not able to complete, the CAISO Market operator will Inform the IT support groups of the Market Disruption and jointly investigate the cause of the failure. The Market Operator actions may include but are not limited to removal of invalid Bids, (effectively making the resource non-participating in CAISO market), remodeling of incorrectly modeled outages, and coordinated all back to backup servers. If a market participant(s) is directly affected by the Market Disruption, the market operator will notify market participant(s) through proper communication channels (Market

Notification System (MNS) phone). If in the event that a Bid is removed from a market run to mitigate Market Disruption, the CAISO Market Operator will notify the EDAM entity via phone call immediately and will provide information specifying when its Bid was removed and the nature of the disruption.

2.19 Initial Conditions/Self-Bridging

A Generating Unit that was committed in the previous day's Day-Ahead Market (IFM or RUC) run (TD-2 for TD-1) but was de-committed before HE24 would normally be considered initially offline in the next day's IFM run for the Trading Day (TD). However, in the event that the Scheduling Coordinator for such Generating Units have submitted Self-Schedules in the Real-Time Market for the remaining hours of the day in which it was not committed in the Day-Ahead Market for the TD-1 date, the CAISO may assume

that the Generating Unit is indicating its intent to be on line at the beginning of the next day (TD). In that case, the CAISO market operator may set the initial condition for such a resource in the IFM conducted on TD-1 for the TD to be online taking into consideration the following conditions:

• The unit was offered in the Day-Ahead Market for all hours through hour ending 24 where it was not economically committed by the IFM from the previous day (TD-1)

• The unit is economically committed for some hours of the TD-2 for TD-1 IFM or RUC processes, but is not committed through the end of TD-1. An IFM partial day self-schedule commitment will not trigger this criterion.

• By one hour prior to the close of the Day-Ahead Market for TD (i.e. at 09:00 on TD-1), the unit has Self-Scheduled Energy (presumably, but not necessarily at PMin) in the RTM for TD-1 for each of the remaining hours after the last economically-committed hour in the DAM for TD-1.

2.20 CMRI/OASIS Reporting Changes

As part of the EDAM release, the CAISO is adding new reports to the CMRI and OASIS platforms, as well as updating existing CMRI and OASIS reports. CMRI, or Customer Market Results Interface, is accessible by Scheduling Coordinators to view market results and other relevant data parameters for their resources. OASIS, or the Open Access Same-time Information System, is accessible to any member of the public and reports externally-available market and pricing information. The following table indicates both new reports and the high-level scope of changes to existing reports for both CMRI and OASIS. More details will be available in the EDAM Business Requirements Specification document.

2.20.1 OASIS

Tab/Category	ategory Report Notes	
Atlas Reference/Listing	Market Resource Listing	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Listing	PNode Listing	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Listing	APNode Listing	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Listing	Convergence Bidding Node Listing	 Extend to include EDAM from CAISO BAA (existing report)

Tab/Category	Report	Notes
Atlas Reference/Listing	Load Distribution Factors (LDFs)	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Listing	Load Aggregation Point Listing	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Listing	Trading Hub Listing	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Listing	Transmission Interface Listing	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Listing	Master Control Area Generating Capability List	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Listing	Control Relaxation Threshold	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Mapping	Trading Hub PNode Mapping	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Mapping	AS Region Node Mapping	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Mapping	RUC Zone PNode Mapping	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Mapping	TAC Area Node Mapping	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Mapping	Intertie Constraint Mapping	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Mapping	Intertie Constraint and Scheduling Point Mapping	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Mapping	Intertie Scheduling Limit and Tie Mapping	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Mapping	Full Network Model Mapping	 Extend to include EDAM from CAISO BAA (existing report)

Tab/Category	Report	Notes
Atlas Reference/Definition	Scheduling Point Definition	• Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Definition	BAA and Tie Definition	 Extend to include EDAM from CAISO BAA (existing report)
Atlas Reference/Definition	Scheduling Point and Tie Definition	 Extend to include EDAM from CAISO BAA (existing report)
Prices/Energy Prices	Locational Marginal Prices	Extend to include EDAM from CAISO BAA (existing report)
Prices/Energy Prices	Scheduling Point/Tie Combination Locational Marginal Prices	Extend to include EDAM from CAISO BAA (existing report)
Prices/Energy Prices	Reference Prices	Extend to include EDAM from CAISO BAA (existing report)
Prices/Capacity Prices	Capacity Prices	• Extend to include EDAM from DAME (new report)
Prices/Capacity Prices	Scheduling Point/Tie Combination Capacity Prices	• Extend to include EDAM from DAME (new report)
Prices/Shadow Prices	Nomogram/Branch Shadow Prices	• Extend to include EDAM from DAME (existing report)
Prices/Shadow Prices	Intertie Constraints Shadow Prices	• Extend to include EDAM from DAME (existing report)
Prices/Shadow Prices	Nodal Group Constraints	Extend to include EDAM from CAISO BAA (existing report)
Prices/Shadow Prices	Imbalance Reserve Constraint Results	Extend to include EDAM from DAME (new DAME report)
Prices/Shadow Prices	Reliability Capacity Constraint Results	Extend to include EDAM from DAME (new report)
Prices/Shadow Prices	Scheduling Constraint Shadow Prices	1. Extend to include EDAM from CAISO BAA (existing report)
Prices/Shadow Prices	Imbalance Reserve Scheduling Constraint Shadow Prices	 Extend to include EDAM from DAME (new report) 2.

Tab/Category	Report	Notes
Prices/Shadow Prices	Capacity Constraint Shadow Prices	Extend to include EDAM from DAME (new report)3.
Prices/Shadow Prices	Aggregate Capability Constraint Shadow Prices	4. Extend to include EDAM from CAISO BAA (existing report)
Prices/AS Prices	AS Clearing Prices	5. Extend to include EDAM from CAISO BAA (existing report)
Prices/Market Power Mitigation	MPM DA Locational Marginal Prices	6. Extend to include EDAM from CAISO BAA (existing report)
Prices/Market Power Mitigation	MPM DA Capacity Prices	Extend to include EDAM from DAME (new report)7.
Prices/Market Power Mitigation	MPM Nomogram/Branch Shadow Prices	 Extend to include EDAM from DAME (existing report) 8.
Prices/Market Power Mitigation	MPM Nomogram/Branch Competitive Paths	• Extend to include EDAM from DAME (existing report)
Prices/Market Power Mitigation	MPM Intertie Constraint Shadow Prices	• Extend to include EDAM from DAME (existing report)
Prices/Market Power Mitigation	MPM Intertie Constraint Competitive Paths	 Extend to include EDAM from DAME (existing report) 9.
Prices/Market Power Mitigation	MPM Reference Bus	10. Extend to include EDAM from CAISO BAA (existing report)
Prices/Market Power Mitigation	MPM Default Competitive Path Assessment List	11. Extend to include EDAM from CAISO BAA (existing report)
Transmission	Transmission Interface Usage	12. Extend to include EDAM from CAISO BAA (existing report)
Transmission	Market Available Transmission Capacity	13. Extend to include EDAM from CAISO BAA (existing report)
System Demand	Wind and Solar Forecast	14. Extend to include EDAM from CAISO BAA (existing report)
System Demand	Load Adjustments	15. Extend to include EDAM from CAISO BAA (existing report)

Tab/Category	Report	Notes
Energy/Schedule	System Load and Resource Schedules	16. Extend to include EDAM from CAISO BAA (existing report)
Energy/Schedule	Expected Energy	17. Extend to include EDAM from CAISO BAA (existing report)
Energy/Schedule	Wind and Solar Summary	18. Extend to include EDAM from CAISO BAA (existing report)
Energy/Schedule	Schedule by Tie	19. Extend to include EDAM from CAISO BAA (existing report)
Energy/Schedule	Schedule Reductions	20. Extend to include EDAM from CAISO BAA (existing report)
Energy/System	Market Power Mitigation Status	 Extend to include EDAM from CAISO BAA (existing report) 21.
Energy/System	Marginal Losses	 Extend to include EDAM from CAISO BAA (existing report) 22.
Energy/System	Day Ahead Market Summary Report	 Extend to include EDAM from CAISO BAA (existing report) 23. May need to split records for CAISO vs EDAM BAA
Energy/System	Operator-Initiated Commitment	24. Extend to include EDAM from CAISO BAA (existing report)
Energy/System	RUC Under Supply Infeasibility and Enforced Constraints	• Extend to include EDAM 25.
Energy/Convergence Bidding	Convergence Bidding Aggregated Awards	 Extend to include EDAM from CAISO BAA (existing report) 26.
Energy/Convergence Bidding	Net Cleared Convergence Bidding Awards	 Extend to include EDAM from CAISO BAA (existing report) 27.

Tab/Category	Report	Notes
Energy/Convergence Bidding	Convergence Bidding Nodal MW Limits	 Extend to include EDAM from CAISO BAA (existing report) 28.
Energy/Uplift	Resource-Specific Uplift	• Extend to include EDAM from DAME (existing report)
Energy/Uplift	Zonal Uplift Payment	• Extend to include EDAM from DAME (existing report)
AS	AS Requirements	• Extend to include EDAM from CAISO BAA (existing report)
AS	AS Results	• Extend to include EDAM from CAISO BAA (existing report)
Capacity/Imbalance Reserve	Imbalance Reserve Requirements & Surplus	• Extend to include EDAM from DAME (new report)
Capacity/Imbalance Reserve	Imbalance Reserve Requirement Thresholds	• Extend to include EDAM from DAME (new report)
Capacity/Imbalance Reserve	Imbalance Reserve Requirements Input Polynomials	• Extend to include EDAM from DAME (new report)
Capacity/Imbalance Reserve	Imbalance Reserve Requirements Uncertainty Histograms	• Extend to include EDAM from DAME (new report)
Capacity/Imbalance Reserve	Imbalance Reserve Forecasts	• Extend to include EDAM from DAME (new report)
Capacity/Imbalance Reserve	Imbalance Reserve Demand Curves	• Extend to include EDAM from DAME (new report) 29.
Capacity/Reliability Capacity	Capacity Aggregate Awards	 Extend to include EDAM from DAME (new report) Combined to include both IR and RC aggregate award data
Public Bids	Public Bids	• Extend to include EDAM from DAME (existing report)
Public Bids	Convergence Bidding Public Bids	Extend to include EDAM from CAISO BAA

2.20.2 CMRI

Tab/Category	Report	Notes
Day-Ahead	Day-Ahead Ancillary Service Market Results	Extend to include EDAM from CAISO BAA
Day-Ahead	Day-Ahead Demand Commodity Prices	Extend to include EDAM from CAISO BAA
Day-Ahead	Day-Ahead Demand Market Results	Extend to include EDAM from CAISO BAA
Day-Ahead	Day-Ahead Generation Commodity Prices	 Extend to include EDAM from DAME (existing report)
Day-Ahead	Day-Ahead Generation Market Results	 Extend to include EDAM from DAME (existing report)
Day-Ahead	Day-Ahead Import-Export Commodity Prices	• Extend to include EDAM from DAME (existing report)
Day-Ahead	Day-Ahead Import-Export Schedules	• Extend to include EDAM from DAME (existing report)
Day-Ahead	Day-Ahead Instructions	Extend to include EDAM from CAISO BAA
Day-Ahead	Day-Ahead Market Power Mitigation (MPM) Results	Extend to include EDAM from CAISO BAA
Day-Ahead	Day-Ahead Unit Commitments	Extend to include EDAM from CAISO BAA
Day-Ahead	Extremely Long Start Resource Instructions	Extend to include EDAM from CAISO BAA
Day-Ahead	RUC Export Schedules by Market Priority Types	Extend to include EDAM from CAISO BAA
Day-Ahead	Day-Ahead Imbalance Reserve and Reliability Capacity Bid MPM Results	• Extend to include EDAM from DAME (new report)
Day-Ahead	Two Day-Ahead Reliability Capacity Advisory Schedules	• Extend to include EDAM from DAME (new report)
Post-Market	CRN	Extend to include EDAM from CAISO BAA

Tab/Category	Report	Notes
Post-Market	Expected Energy Allocation Details	 Extend to include EDAM from CAISO BAA Additional EE types related to DA, similar to CAISO BAA.
Post Market	Evported Energy	Extend to include EDAM from CAISO BAA
Post-Market Post-Market	Expected Energy ISO Commitment Cost Details	 Additional EE types related to DA, similar to CAISO BAA. Extend to include EDAM from CAISO BAA
Post-Market	Resource Level Movement	Extend to include EDAM from DAME (existing report)
Post Market	Virtual Forecasted Movement	Extend to EDAM from DAME (new report)
Default Bids	Default Energy Bid Curves	Extend to include EDAM from CAISO BAA
		Extend to include EDAM from CAISO BAA
		Add DAM as Market type.
Default Bids	Greenhouse Gas Bid Cap	Add GHG Area to this report.
Default Bids	Default Commitment Costs	Extend to include EDAM from CAISO BAA
Default Bids	Daily Electricity Price Index (EPI)	Extend to include EDAM from CAISO BAA
Default Bids	Actual Limitation Values	Extend to include EDAM from CAISO BAA
Default Bids	Resource Opportunity Costs	Extend to include EDAM from CAISO BAA
Default Bids	Default Availability Bid Curves	Extend to include EDAM from DAME (new report)
Convergence Bidding	Convergence Bidding Awards	Extend to include EDAM from CAISO BAA
Forecast	Variable Energy Resource Forecast	Extend to include EDAM from CAISO BAA
Reference	Intertie Resource Transaction ID	Extend to include EDAM from CAISO BAA
Reference	Aggregate Capability Constraint Definitions	Extend to include EDAM from CAISO BAA

Tab/Category	Report	Notes
Reference	Aggregate Capability Constraint Limits	Extend to include EDAM from CAISO BAA
LSE	Expected Energy LSE	Extend to include EDAM from CAISO BAA
Gas Burn	GAS Burn Summary	Extend to include EDAM from CAISO BAA
Gas Burn	GAS Burn Detail	Extend to include EDAM from CAISO BAA
Reliability Coordination	Forecasted Generation	• Extend to include EDAM from DAME (existing report): continue to publish REN

2.21 Demand Forecast

- The CAISO provides a Demand Forecast for each EDAM Entity unless the EDAM Entity elects to submit its own Demand Forecast. Please refer to section 11.6 in the Energy Imbalance Market BPM for detail on CAISO Forecast of BAA Demand. The forecast option selected by the EDAM Entity will be the same forecast option that is utilized in the WEIM.
 - Non-participating Demand Response (DR) (e.g., Demand Response in a EDAM Entity BAA that are not represented by PDR or RDRR models) shall be accounted for in the formation of the CAISO forecast of EDAM Demand as a load reduction if received prior to 8am. A performance factor may be applied to the load reduction as part of monitoring and enforcing non-participating DR performance.
- The CAISO provides a Variable Energy Resource (VER) Forecast for each EDAM Entity unless the EDAM Entity elects to submit its own VER Forecast. Please refer to section 11.7 in the Energy Imbalance Market BPM for detail on VER Forecasting. The forecast option selected by the EDAM Entity will be the same forecast option that is utilized in the WEIM.