



California ISO

Western EIM Base Schedule Submission Deadline Issue Paper / Straw Proposal

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1 Executive Summary

In the Bonneville Power Authority (BPA) Energy Imbalance Market (EIM) implementation agreement the CAISO proposed to examine moving the final market closing timeline for financially binding hourly resource plans via a stakeholder process. This proposed change would move the final market closing timeline from forty minutes prior to the operating hour (T-40) to thirty minutes prior to the operating hour (T-30). This is intended to provide EIM scheduling coordinators with additional flexibility to submit more accurate base schedules closer to the operating hour.

In this same initiative the CAISO is also proposing to examine updating tariff rules and market system to allow EIM Entities to submit base schedules with energy below a resource's minimum load. This proposed modification will allow CAISO and EIM Entities to more accurately capture the startup energy of large conventional resources within their Resource Sufficiency Evaluations (RSE), thus increasing their ability to pass the RSE while lowering their exposure to uninstructed imbalance energy settlement.

2 Initiative Scope

This initiative will examine updates to the base schedule submission timeline as well as the inclusion of startup energy below a resource's minimum load:

- Examine moving the market closing timeline for financially binding base schedules from forty minutes prior to the operating hour (T-40) to thirty minutes prior to the operating hour (T-30).
- Examine allowing startup energy to be accounted for in the base schedule of an EIM entity. This will allow for its inclusion in the RSE and a potential reduction of imbalance energy settlement.

3 Background

3.1 EIM Base Schedule Submission

EIM entities are required to submit resource plans on an hourly basis. The CAISO as the market operator then evaluates these plans prior to the operating hour¹. The current EIM design utilizes a sequential base schedule submission process. The first base schedule deadline at T-75 contains non-participating resources hourly base schedules, EIM participating resource scheduling coordinator energy bids, and base schedules for participating resources for the upcoming operating hour. Each 15-minute interval is then evaluated for capacity and flexible ramping. A second base schedule submission deadline at T-55 is designed to allow EIM entities to review and update their base schedule following validation by the market operator between the first and second

¹ BPM for Energy Imbalance Market p51:
[https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Energy Imbalance Market](https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Energy%20Imbalance%20Market)

submission deadlines. An additional round of validation is performed by the market operator and a final, financially binding, base schedule submitted by the EIM entity scheduling coordinator is due to the market operator at T-40 of the operating hour. This base schedule is used to balance against the load forecast and serves as the baseline for settling imbalance energy in the EIM.

3.2 Energy below minimum load

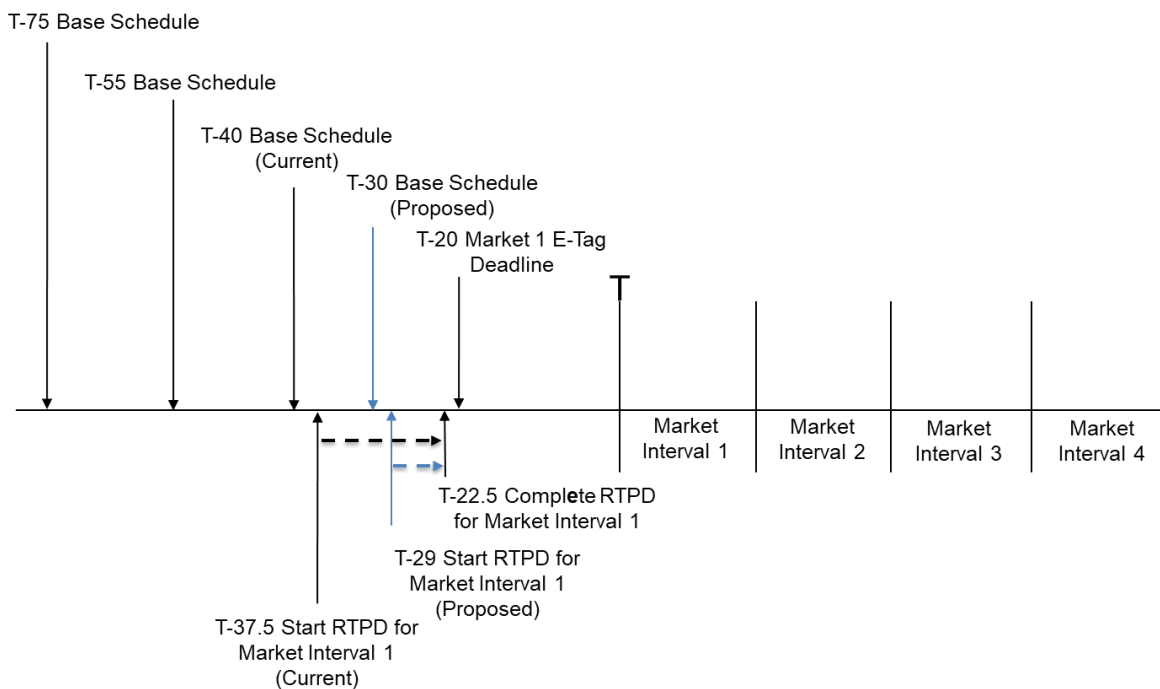
The CAISO Tariff limits the submission of EIM base schedules with energy above zero but below a resource's minimum load. Energy is produced in this region when a resource is starting and ramping to its minimum load (Pmin). It is possible for resources to have multi-hour start times and minimum loads in the hundreds of MW. This limits an EIM scheduling coordinator's ability to accurately account for startup energy in their base schedule submission for the RSE. This leaves the EIM entity with two options: either exclude this energy from the base schedule, which results in no inclusion in the RSE, or reallocate this energy to other online resources. Neither of these options allows the EIM entity to accurately capture a potentially significant amount of energy produced while a resource is starting.

4 Proposal

4.1 EIM Base Schedule Submission Deadline

The CAISO is proposing to move the final financially binding base schedule submitted by the EIM entity scheduling coordinator from T-40 to T-30 of the operating hour. To accommodate this revised submission deadline, the CAISO plans to make application changes that will run the real time pre-dispatch (RPTD) interval that currently starts at T-37.5 on an abbreviated timeline. The final base schedule test will also be moved to after the T-30 deadline. The RTPD interval will complete at the same time as the current design, prior to the T-20 tagging deadline. The modified submission timeline can be seen below in Figure 1.

Figure 1: Revised Base Schedule Submission Timeline



Revising the submission deadline will offer benefits to all EIM participating entities via the ability to submit more accurate schedules closer to the operating hour. More accurate base schedules, specifically non-participating balancing schedules, will improve the physical modeling of flows in the RTPD that currently start at T-37.5 leading to more efficient market results. The additional time will also allow the EIM entity scheduling coordinators to minimize the financial impact of imbalance settlement.

BPA provides a good example of how this additional time can be leveraged. A portion of BPA’s customers operate on slice contracts² which can be updated past T-40 from the operating hour. Should they elect to utilize this functionality, BPA would be able to update base schedules at T-30 to reflect these slice nominations, and potentially limit exposure to imbalance energy charges. To offer this additional flexibility, the CAISO will be shortening the run time of the T-37.5 RTPD interval; this has been tested and is viewed as feasible.

4.2 EIM Base Schedule Energy Below Minimum Load

The CAISO proposes to allow resources’ startup energy to be included within all EIM entities’ hourly resource plans. To accommodate this, the CAISO plans to modify the logic of the Base Schedule Aggregation Portal (BSAP) and the RSE to allow for startup energy to be submitted as part of an EIM entity’s base schedule; current validation rules

² Conformed Slice Block Template: <https://www.bpa.gov/p/Power-Contracts/Regional-Dialogue/Pages/Regional-Dialogue.aspx>

reject such schedules. For EIM entities, the submission of more accurate base schedules will minimize uninstructed imbalance energy settlement as the startup energy will be reflected in a base schedule.

This energy will be counted as part of an EIM entity's RSE for the EIM area balancing test, however no changes will be made to the capacity and flexible ramp sufficiency tests themselves, nor the transmission feasibility test. The CAISO recognizes this creates a difference on how startup energy will be treated for EIM and CAISO resources. The CAISO produces balanced day-ahead schedules via its Integrated Forward Market (IFM), while EIM entities are responsible for the creation of their own balanced schedules. This difference allows EIM entities to include this information directly in the submission of their base schedules. To achieve similar treatment for the CAISO, the IFM would need to include this startup energy within its optimization. Any after-the-fact inclusion of this energy to balanced day-ahead schedules would potentially create upward flexibility, at the expense of downward flexibility. As the CAISO schedules are already balanced, the CAISO does not believe this additional upward flexibility is worth the potential risk of failing the RSE in the downward direction. Rather, the CAISO believes the inclusion of startup energy within the day-ahead market should be done holistically through either the ongoing EDAM initiative or a future initiative.

The CAISO proposes that startup energy be included as part of an EIM entity's base schedule, with deviations from the base schedule settled as uninstructed imbalance energy (UIE). No changes will be made to the settlement of startup energy for resources internal to the CAISO. To ensure equitable bid cost recovery (BCR) allocation between EIM entities and the CAISO, the CAISO is proposing to modify how BCR is allocated. BCR is currently calculated as the sum of net EIM transfers (exports from a BAA) divided by the sum of the absolute value of UIE load, the absolute value of supply UIE, the absolute value of unaccounted for energy (UFE), and the net scheduled interchange out of the balancing authority area (BAA)³. The startup energy submitted as part of an EIM entity base schedule will be added back into denominator as an additional variable ensuring there is no cost shift between BAAs. A simplified equation representing the revised BCR calculation for an EIM entity can be seen below in Figure 2.

Figure 2: Simplified BCR Calculation

$$\frac{\sum EIM\ Transfers\ (Export)}{\sum EIM\ Transfers\ (Export) + |UIE| + |UFE| + Base\ Schedule\ Startup\ Energy}$$

³ Energy Imbalance Market-Draft Final Proposal P70:
<http://www.caiso.com/Documents/EnergyImbalanceMarket-DraftFinalProposal092313.pdf>

The submission of the startup base schedules is at the discretion of the EIM entity base schedule coordinator. The amount of energy submitted should be the average hourly startup energy. This can be determined by taking the integral of energy across each 15-minute interval within the hour, then averaging these values to obtain a MWh value.

Ancillary services will not be permitted on a resource during intervals the resource is shown on an EIM base schedule below its minimum load. The CAISO assumes that when producing energy below its minimum load a resource will ramp in a linear manner up to its minimum load, and thus would not be available to provide any ancillary services. Further to ensure this functionality is not misused, the CAISO is proposing to perform a validation on the submitted EIM base schedules as well as monitor the submitted EIM base schedules. The conditions the CAISO proposes to validate and monitor, outlined below, align with the expected startup characteristics of conventional resources. They also will act to prevent the inclusion of shutdown energy which is outside the scope of this initiative.

BSAP Validation

- A base schedule below minimum load in an hour when there is a base schedule at or above minimum load in the previous hour.

After-the-fact monitoring

- A non-monotonically increasing pattern of base schedules below minimum load over consecutive hours.
- Lack of a base schedule in an hour when there is a base schedule below minimum load in the previous hour.
- Base schedules below minimum load for an unreasonably long multi-hour period based on the resource registered technology and startup profile.

5 Stakeholder engagement and next steps

5.1 Energy Imbalance Market Governing Body

This initiative includes proposed changes to base schedule submission timelines as well as the ability to include start up energy within a base schedule. These proposals are severable for purposes of the stakeholder process. Following comments to the straw proposal the CAISO will decide to keep this initiative intact as described, or split it into two initiatives.

The CAISO has not yet done a detailed analysis of the EIM Governing Body's role in the approval of tariff changes resulting from this initiative, but believes that the scope of this initiative is likely within the EIM Governing Body's primary approval authority.

An initiative proposing to change rules of the real-time market falls within the primary authority of the EIM Governing Body if 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, for proposed market rules that are generally applicable, if “an issue that is specific to the EIM balancing authority areas is the primary driver for the proposed change.”

The scope items included in this initiative initially appears to meet this criteria. The CAISO welcomes stakeholder comments regarding this classification.

5.2 Schedule

The schedule for stakeholder engagement is provided below. The CAISO targets the December 2, 2020 EIM Governing Body and December 15-16, 2020 CAISO Board of Governors’ meeting.

Date	Event
September 24, 2020	Post Issue Paper/Straw Proposal
September 30, 2020	Stakeholder Call
October 14, 2020	Comments on Issue Paper/Straw Proposal Due
October 30, 2020	Publish Draft Final Proposal
November 6, 2020	Stakeholder Call
November 18, 2020	Comments on Draft Final Proposal Due
December 2, 2020	EIM Governing Body Meeting
December 15-16 2020	CAISO Board Meeting

Stakeholders should attend the stakeholder conference call on September 30, 2020 and provide written comments using the commenting tool linked on the initiative [webpage](#) by October 10, 2020.