



California ISO
Shaping a Renewed Future

Energy Imbalance Market

Tariff Framework

September 10, 2013

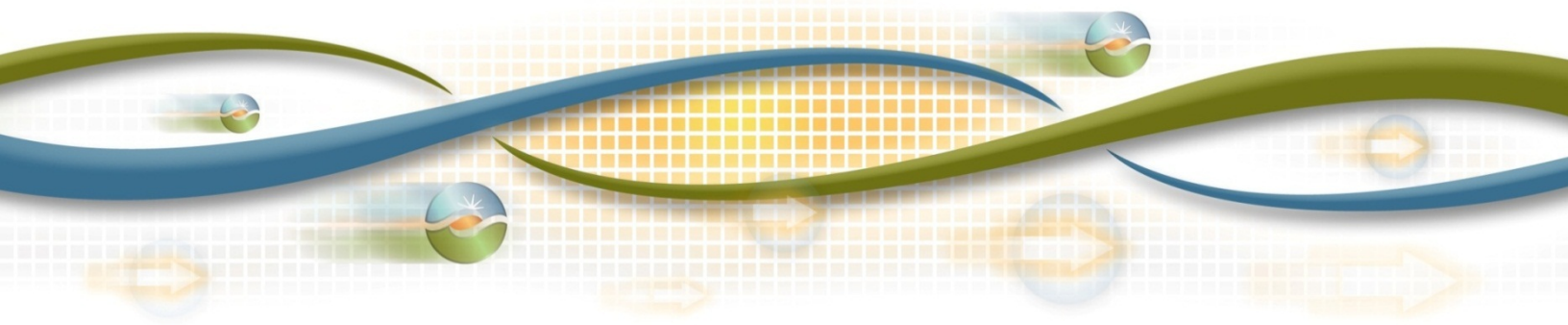


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1. Introduction

The California ISO (ISO), as part of its proposal to offer Energy Imbalance Market (EIM) services to other balancing authorities in the west, has committed to include the EIM rules in a discrete part of the ISO tariff. This paper presents an EIM tariff framework that seeks to implement this principle and lay the foundation for the draft tariff language to follow.

The tariff framework is based on the 3rd Revised Straw Proposal dated August 13, 2013. The tariff framework first breaks down the elements of the current straw proposal into its discrete components. It accomplishes this by stripping out background information, justification, and other discussion of the various market design elements that likely would not become part of the EIM rules. Next, the tariff framework reorganizes this information into a structure that mirrors the existing ISO tariff numbering scheme, which will be included in the currently blank Section 29 of the ISO tariff. For example, EIM settlement related provisions would be included in subsection 29.11 to mirror the existing settlement provisions found in Section 11 of the ISO tariff. EIM specific headings and subheadings are included to help identify discrete concepts and other distinctions among the various component parts.

The tariff framework does not represent draft tariff language, which will only be published after the final market design has been approved by the ISO Board of Governors. There has been some effort to adjust language from the 3rd Revised Straw Proposal to more appropriately fit within the tariff framework, but by no means has there been a complete effort to redraft the language, fill in areas that may require additional detail, remove extraneous text, consider the extent some material may be more appropriately included in a business practice manual, or develop other aspects of what would be required to represent draft tariff language. The draft tariff is scheduled for publication November 12, 2013 and will be based on this framework, but it will reflect formal and more concise tariff language than what is presented.

The ISO nonetheless believes the tariff framework will be helpful stakeholders in understanding how the market design will be structured and incorporated into the ISO tariff. In particular, we ask stakeholders to consider the overall structure organization of the information, and identify areas that will need further attention in the draft tariff. It is not necessary to provide specific feedback on the wording as will be expected in response to the draft tariff. We appreciate your perspective on this important transformative step and look forward to your feedback.

2. Guiding Objectives for the Tariff Framework

In developing the EIM tariff framework, the ISO considered the following objectives:

- a. Clarity:** The tariff framework should offer a clear guide to the ISO tariff provisions applicable to the EIM. This will ensure that stakeholders and participants in the EIM understand the scope of the ISO tariff under review and the requirements for participation.
- b. Consistency:** The tariff framework should reference the current ISO tariff with respect to provisions equally applicable to the EIM and current market participants. This will reduce redundancy and the potential for inconsistency.
- c. Comprehension:** The tariff framework should provide an opportunity for stakeholders to comprehend the relationship between the straw proposal and the expected tariff provisions. This will promote the identification of EIM rules that need further definition, and those that are already fully developed.
- d. Certainty:** The tariff framework should provide a reference point for the scope of EIM rules under the purview of the Transitional Committee described in the EIM governance proposal. This will provide a level of certainty concerning which areas of the ISO tariff would be the focus of the Transitional Committee.

3. Tariff Framework Rules of Construction

This section describes the rules of construction concerning the relationship between the EIM tariff framework and the ISO tariff. This interpretive information will apply to the EIM rules but will not be reflected in the ISO tariff provisions. It is provided here to assist stakeholders in understanding the tariff framework and the ISO tariff provisions to be developed in this stakeholder process.

3.1. EIM Rules

The EIM rules will be part of the ISO tariff – not a separate tariff. This means that the EIM rules will apply equally to all participants no different than any other provision of the ISO tariff. However, the EIM rules may be limited in their application through the use of appropriately defined terms, specific references, or exclusions.

3.2. CAISO Tariff

Generally applicable provisions of the ISO tariff will apply to EIM participants. For example, all participants in the EIM will be considered “Market Participants” and all ISO tariff provisions applicable to Market Participants will apply to EIM participants unless otherwise specifically excluded. Likewise, an EIM Entity Scheduling Coordinator will be considered a “Scheduling Coordinator” and all ISO tariff provisions applicable to Scheduling Coordinators will apply unless otherwise specifically excluded.

3.3. EIM Agreements

All agreements necessary for participation in the EIM will be *pro forma* service agreements included within the ISO tariff. To the greatest extent possible, operative provisions will be included in the ISO tariff and incorporated by reference. These service agreements will be considered through the stakeholder process and not individually negotiated. Accordingly, the ISO encourages stakeholders to comment on these agreements when they are published as part of the draft tariff language.

4. EIM Tariff Framework

The EIM tariff framework is set forth below. The CAISO welcomes stakeholder comments and suggestions regarding this proposed framework to establish a solid foundation upon which the EIM rules will be drafted and presented to stakeholders for further comment.

29. Energy Imbalance Market

29.1. General Provisions

Participation, operation, and settlement of the Energy Imbalance Market shall be subject to the provisions of CAISO Tariff Section 29, and to all other provisions of the CAISO Tariff to the extent that those provisions are, by their terms, applicable to the Energy Imbalance Market.

The provisions of Section 29 shall apply only to the EIM.

29.2. Access To EIM

29.2.1 EIM Access

The CAISO shall administer the EIM in accordance with the terms of the CAISO Tariff.

29.2.2 Transmission Access

The CAISO does not provide transmission access under CAISO Tariff Section 29. Each EIM Entity Scheduling Coordinator and EIM Participating Resource Scheduling Coordinator must obtain any necessary transmission services under the terms of the CAISO Tariff or the relevant tariff of another transmission service provider.

29.3. Local Furnishing, Other Tax-Exempt Bond Facility Financing

The provisions applicable to transmission facilities owned by a Local Furnishing PTO or other Tax-Exempt PTO in CAISO Tariff Section 3 do not apply to the Energy Imbalance Market.

29.4. Roles And Responsibilities

29.4.1 CAISO as Balancing Authority

The CAISO retains its responsibilities under NERC and WECC rules as the Balancing Authority for the CAISO Balancing Authority Area and as the transmission operator for the CAISO Controlled Grid.

The CAISO performs the functions of the Balancing Authority for its Balancing Authority Area and other functions for which is registered, including but not limited to the procurement of ancillary services, operating reserve management, automatic generation control balancing of load and resources, system operating limit and interconnection reliability operating limit management, disturbance control standards events recovery and voltage control.

During any market maintenance activities, the CAISO is responsible for managing and communicating to the resources (static and dynamic) in its respective Balancing Authority Area, and interchange schedules for the current and future hours.

29.4.2 CAISO as EIM Market Operator

The CAISO runs the Energy Imbalance Market, dispatches generation resources, and financially settles the real-time market, including generation and load.

The CAISO only dispatches resources that are online and for which the EIM Participating Resource Scheduling Coordinator has provided energy bids for EIM dispatch. The CAISO assumes that resources in the EIM Entity Balancing Authority Area are online if they have a base schedule.

The CAISO sends dispatch instructions to the EIM Participating Resource Scheduling Coordinator and the EIM Entity Scheduling Coordinator for generating units that have bid into the EIM.

To ensure the EIM's integrity, the CAISO monitors the market's performance and its participants' activities.

29.4.3 EIM Entity as Balancing Authority

The EIM Entity retains its responsibilities under NERC and WECC rules as the Balancing

Authority for the EIM Entity Balancing Authority Area and, to the extent applicable, as the transmission operator for transmission facilities within its Balancing Authority Area.

The EIM Entity performs the functions of the Balancing Authority for its Balancing Authority Area and other functions for which is registered, including, but not limited to, procurement of ancillary services, operating reserve management, automatic generation control balancing of load and resources, system operating limit and interconnection reliability operating limit management, disturbance control standards events recovery and voltage control.

During any market maintenance activities where regular market runs are briefly suspended, the EIM Entity is responsible for managing and communicating to the resources (static and dynamic) in its Balancing Authority Area the interchange schedules for current and future hours.

29.4.4 EIM Entity

The EIM Entity is responsible for the following:

- Ensuring all NERC and WECC standards are met within its system.
- Providing all NERC and WECC notifications regarding its system.
- Defining Load Aggregation Points in its Balancing Authority Area.
- Ensuring all base interchange schedules are below the associated inter-tie limits and make any reliability curtailments as required.
- Performing base interchange e-tagging functions and validations.
- Managing their market resources when the Energy Imbalance Market is not (or cannot) manage them as required for congestion or other system conditions. Because management of resources for reasons other than market conditions (i.e., exceptional dispatch) is a reliability function, the need for which is determined by the EIM Entity rather than by the affected resources, changes from base schedules due to exceptional dispatch must be communicated to the CAISO by the EIM Entity through the EIM Entity Scheduling Coordinator.
- Approving or denying outages in its system.
- Ensuring network topology and real-time information is correctly reflected in the real-time market optimization, including scheduled outages, forced outages, and accurate telemetry.

- Determining transmission capability (e.g., system operating limits) for inter-ties and internal constraints as needed for the Energy Imbalance Market and promptly communicating the limits to the CAISO, including adjusting/conforming limits as required due to differences between actual flow as measured by actual telemetry or state estimator and the flows calculated by the market model (market flow).
- Communicating any changes to interchange schedules (real-time curtailments) to the CAISO, as soon as they are known.

The EIM Entity determines which resource types and transmission service are eligible to participate in the EIM within the EIM Entity Balancing Authority Area.

The CAISO and the EIM Entity must communicate to ensure functional coordination.

29.4.5 Responsibilities of An EIM Entity Scheduling Coordinator

The EIM Entity Scheduling Coordinator coordinates and facilitates the Energy Imbalance Market for the EIM Entity.

The EIM Entity Scheduling Coordinator must be either an existing Scheduling Coordinator or meet the certification requirements in CAISO Tariff Section 4.5.1 for a Scheduling Coordinator and all other applicable obligations of a Scheduling Coordinator. The EIM Entity Scheduling Coordinator may be the EIM Entity or an agent of the EIM Entity. The EIM Entity Scheduling Coordinator must be a separate entity from the EIM Participating Resource Scheduling Coordinator.

The EIM Entity Scheduling Coordinator must enter an EIM Entity Scheduling Coordinator Agreement, but is not required to enter a Scheduling Coordinator Agreement under Section 4.5.1.1.11.

The EIM Entity Scheduling Coordinator must register all generating resources in the CAISO's Master File.

The EIM Entity Scheduling Coordinator must comply and submit hourly load forecasts and balanced base supply, demand, and interchange schedules to the CAISO for the EIM Entity Balancing Authority Area, as well as submitting these schedules to the WECC reliability coordinator.

The EIM Entity Scheduling Coordinator must manage all of the outages and submit outage

information for the non-participating resources in its Balancing Authority Area to the CAISO through the outage management system.

The EIM Entity Scheduling Coordinator is required to submit all information required by the Energy Imbalance Market within the timeframe established by the CAISO.

The EIM Entity Scheduling Coordinator with registered resources is required to submit resource plans and to keep the plans up to date throughout the operating day.

For interchange transactions included in a resource plan, the EIM Entity Scheduling Coordinator is responsible for ensuring that e-Tags are created and processed for bilateral schedules between Balancing Authority Areas that are arranged at least forty minutes prior to the operating hour, as required by NERC, NAESB, and WECC standards and business practices, and may be required to create and process e-Tags within a Balancing Authority Area by a transmission provider's business practices.

The EIM Entity Scheduling Coordinator is responsible for all financial obligations arising as a result of meeting these requirements, including financial settlement with non-participating resources within the EIM Entity Balancing Authority Area and neutrality charges and uplifts.

The EIM Entity Scheduling Coordinator shall allocate the EIM costs and revenues that are not directly assessed as charges to EIM Participating Resource Scheduling Coordinators.

The EIM Entity Scheduling Coordinator is responsible for settling imbalance energy in the EIM Entity Balancing Authority Area that is not settled in the Energy Imbalance Market.

An EIM Entity Scheduling Coordinator shall represent only EIM Entities unless it has also entered a Scheduling Coordinator Agreement under Section 4.5.1.1.11.

29.4.6 Responsibilities of EIM Participating Resource Scheduling Coordinator

The EIM Participating Resource Scheduling Coordinator is the interface between a resource participating in the EIM and the CAISO, as well as between the resource and the EIM Entity Scheduling Coordinator.

The EIM Participating Resource Scheduling Coordinator must be an existing Scheduling Coordinator or meet the certification requirements in CAISO Tariff Section 4.5.1 for a Scheduling Coordinator.

The EIM Participating Resource Scheduling Coordinators is required to submit information about the operating characteristics of the resources it represents into the CAISO's Master File.

The EIM Participating Resource Scheduling Coordinator may submit energy bids to the CAISO and must inform the EIM Entity Scheduling Coordinator about the amount of generation that it has bid into the EIM.

The EIM Participating Resource Scheduling Coordinator may submit economic bids into the Energy Imbalance Market on behalf of the EIM Participating Resources that are voluntarily participating in the EIM. The bids that the EIM Participating Resource Scheduling Coordinator submits on behalf of the participating resource it represents will be treated as Dynamic Resource Specific System Resources.

The EIM Participating Resource Scheduling Coordinator must manage all outages and submit outage information for the EIM Participating Resources that it represents to the CAISO using the outage management system.

The EIM Participating Resource Scheduling Coordinator must submit all information required by the Energy Imbalance Market for the EIM Participating Resources that it represents within the required timeframe established by the CAISO.

The EIM Participating Resource Scheduling Coordinator is responsible for the financial settlement of the Imbalance Energy Market charges for the EIM Participating Resources it represents.

An EIM Participating Resource Scheduling Coordinator shall represent only EIM Participating Resources unless it has entered a Scheduling Coordinator Agreement under section 4.5. 1.1.11.

29.5. [Not Used] Participation And Resource Registration

29.5.1 EIM Participation

29.5.1.1 EIM Entity

To become an EIM Entity, a Balancing Authority must sign the EIM Entity Agreement with the CAISO and pay an initial fee to the CAISO to cover start-up costs. This payment is established through an individual implementation agreement approved by FERC.

The CAISO shall provide an annual window according to the schedule set forth in the Business Practice Manual during which Balancing Authorities may enter into an implementation agreement. The ISO anticipates implementations will be established based on an associated 12-18 month implementation effort to follow, depending upon the complexity of the Balancing Authority Area.

Inclusion of a new EIM Entity Balancing Authority Area in the Energy Imbalance Market shall occur:

- Following execution of the EIM Entity Agreement and completion by the CAISO and the Balancing Authority of all necessary implementation activities, the scope and length of which depend on the complexity of the system and the timing of the commitment, and
- Coincide with the implementation of either the CAISO's spring and fall software release cycle.

An EIM Entity may terminate participation in the EIM by providing written notice of its intent to terminate to the CAISO at least 180 days prior to the termination date.

29.5.1.2 EIM Participating Resource

To participate in the Energy Imbalance Market, a resource must meet the eligibility requirements of the EIM Entity in whose Balancing Authority Area the resource is located and the eligibility requirements of the CAISO and must enter an EIM Participating Resource Agreement.

The CAISO's eligibility requirements are as follows:

- In the five-minute market, eligible resources are those that can deliver energy, curtailable demand, demand response services or other similar services under the CAISO Tariff, and may include Generating Units, Physical Scheduling Plants, Participating Loads, Proxy Demand Resources, Non-Generator Resources and Dynamic Transfers. A Generating Unit must have a minimum nameplate capacity of 0.5 MW. Participating Load may be netted against generation at the PNode level.
- In the fifteen-minute market, imports and exports that can be scheduled on a fifteen-minute basis are eligible to participate in addition to all resources eligible to participate in the five-minute market.
- All eligible resources must sign an EIM Participating Resource Agreement with the CAISO and secure representation by a Scheduling Coordinator.

29.5.2 Resource Registration

All resources in an EIM Entity's Balancing Authority Area must be registered in the CAISO's Master File as described in this Section 29.5. Registration must include resource characteristics, such as ramp rates and minimum and maximum operating capacity.

Resource ramp rates may have a segmented profile of at least one segment and optionally having multiple segments, as detailed in the Market Instruments Business Practice Manual.

For multi-stage generating resources, each resource configuration may have separate resource characteristics.

Information in the Master File should be updated whenever resource operating and technical characteristics have persistent changes, and in the outage management system when there are short-term limitations.

29.5.2.1 EIM Entity Scheduling Coordinator

The EIM Entity Scheduling Coordinator must register all generating resources in the CAISO's Master File. The registration includes the submission of information about the operating characteristics of each resource, as set forth in the Market Instruments Business Practice Manual, Appendix B. Registration is required for non-participating resources for purposes of the market optimization and settling their potential uninstructed imbalance energy in the Energy Imbalance Market based upon five-minute meter data.

The EIM Entity must register and update the CAISO's Master File with the associated static network topology information associated with transmission capacity that it owns, controls or has a contractual entitlement to use on a regular basis that but no less frequently than the timelines for updates to the Full Network Model as provided in the CAISO Tariff and Business Practice Manual. The EIM Entity is responsible for the accuracy and completeness of this information.

29.5.2.2 EIM Participating Resource Scheduling Coordinator

The EIM Participating Resource Scheduling Coordinator is required to submit information about the operating characteristics of the resources it represents into the CAISO's Master File.

29.6. Communications

29.6.1 EIM Communications

[To be further developed and included in tariff, business practice manuals, and operating procedures depending upon the final proposal.]

29.6.2 EIM OASIS Information

The CAISO will post on OASIS:

- 15-minute and 5-minute LMPs, calculated by Real-Time Unit Commitment and Real-Time Dispatch for all nodes and LAPs in the EIM Entity Balancing Authority Area.
- list of binding transmission constraints in the EIM Area in the 15-minute and 5-minute market solutions obtained from Real-Time Unit Commitment and Real-Time Dispatch .
- relevant limits and associated shadow prices.
- Information regarding binding constraints for advisory intervals.

29.7. System Operations Under Normal And Emergency Conditions

29.7.1 EIM Operating Criteria

Nothing in Section 29 of the CAISO Tariff shall modify, change, or otherwise alter the obligations of the CAISO or an EIM Entity under the Reliability Standards.

29.7.2 Routine Operation of EIM

The CAISO shall operate the EIM within the limit of all Nomograms and established operating limits and procedures. The CAISO and each EIM Entity shall comply with Good Utility Practice with respect to the EIM.

29.7.3 Normal EIM Operations

The CAISO shall use Energy Bids it has received to respond to operating events and maintain balance on the system.

29.7.4 Management Of Contingencies and Emergencies

29.7.4.1 Contingency Dispatch

Each EIM Entity is responsible in its Balancing Authority Area for:

- Frequency and tie-line control through use of its automatic generation control process; and
- Recovery from contingencies that involve loss of generation or inertias by dispatching contingency reserves.

Each EIM Entity should reserve generating capacity from EIM Entity resources from the top and bottom of their energy bid to be used in the event a contingency occurs.

The CAISO will net EIM dispatches and demand forecast deviations for each EIM Entity Balancing Authority Area to produce a dynamic net interchange schedule for purposes of automatic generation control.

The EIM Entity Scheduling Coordinator must inform the CAISO of a contingency dispatch for the EIM Entity Balancing Authority Area by revising the base schedule of the affected resources. If the CAISO receives the resource's change in schedule before the 15-minute market for the relevant interval, the contingency dispatch instructions will be settled at the applicable 5-minute price. The CAISO will reflect 15-minute schedule updates in the 5-minute dispatch instructions.

29.7.4.2 EIM Exceptional Dispatch

If the EIM Entity dispatches a resource in its Balancing Authority Area to address a system or stability issue that is not incorporated into the flow-based limitations of the CAISO's model, then the dispatch is an exceptional dispatch.

The EIM Entity may issue an exceptional dispatch, outside of the EIM optimization, when necessary to maintain reliability and address any transmission reliability issue occurring in the EIM Entity Balancing Authority Area that the CAISO is not able to enforce through normal

economic dispatch and transmission constraints.

An exceptional dispatch issued by the EIM Entity to an EIM Participating Resource shall be treated as an imbalance deviation and settled at the LMP with no specific exceptional dispatch settlement from the CAISO until such reliability based constraints on the resources are incorporated into the 15-minute market. The CAISO will not issue exceptional dispatches to EIM Participating Resources.

An exceptional dispatch issued by the EIM Entity to a non-participating resource in its Balancing Authority Area must be immediately reported to the CAISO by the EIM Entity Scheduling Coordinator to enable the CAISO to coordinate the movement of the resource in the EIM and the actual reliability need of EIM Entity Balancing Authority Area in real-time.

29.7.4.3 EIM Emergency

When the CAISO has used the Energy available to it under such Energy Bids and such Energy is ineffective in responding to the operating events and maintaining balance on the system and the CAISO or the EIM Entity is still in need of additional Energy, the CAISO shall relinquish Dispatch authority over EIM Participating Resources or assume supervisory control of Generating Units as provided in Section 7 of the CAISO Tariff [the supervisory control provision of section 7.6 only applies to Generating Units, i.e., those in the CAISO Balancing Authority Area and interconnected to the CAISO Controlled Grid] as the the circumstances may require. It is expected that at this point, the operational circumstances in the CAISO or EIM Area will be so severe that a Real-Time system problem or emergency condition could be in existence or imminent. The CAISO shall suspend transfers between impacted Balancing Authority Areas and all EIM Entities shall follow Reliability Standards applicable to their role as Balancing Authority in an effort to alleviate the system conditions and restore routine operations.

When, in the judgment any EIM Entity, the EIM Area is in danger of instability, voltage collapse or under-frequency caused by transmission or Generation conditions in the relevant Balancing Authority Area the EIM Entity will declare an EIM Emergency. The EIM Entity will remove the declaration when it is satisfied, after conferring with EIM Entities and Reliability Coordinators within the WECC, that the major contributing factors have been corrected. This removal will reinstate transfers between the CAISO and EIM Areas and restore the EIM if it has been suspended.

29.7.4.4 Report of Contingency/Emergency Dispatch

The CAISO may inform the WECC Reliability Coordinator of EIM dispatches and may enforce constraints, if requested by the reliability coordinator.

The EIM Entity is responsible for coordinating reliability curtailments, including activation of WECC's Unscheduled Flow Mitigation Plan or reliability coordinator intervention in mandating schedule curtailments, in its Balancing Authority Area. An EIM Entity may choose to take such actions after the CAISO notifies the EIM Entity that the CAISO observes congestion or other conditions and has no effective bids for resolving it, or may choose to take reliability actions separately, based on its own procedures.

Any actions taken by the EIM Entity will be communicated to the CAISO by the EIM Entity Scheduling Coordinator through updates to the base schedule, interchange tags, transmission limit adjustments, and/or outage and derate information, as applicable.

29.7.5 Congestion Management

Except in emergency conditions, congestion management using Bids available in the EIM is automatically activated when an actual or potential constraint is observed in real-time. Under certain conditions, additional congestion management procedures may be initiated through WECC's Unscheduled Flow Mitigation Procedure.

An EIM Entity or other Balancing Authority may initiate WECC's Unscheduled Flow Mitigation Procedure if applicable for conditions under its jurisdiction. If that procedure is initiated by an EIM Entity, the CAISO adjusts the affected schedules as determined by the Unscheduled Flow Mitigation Procedure.

If the Unscheduled Flow Mitigation Procedure has not been initiated, the CAISO manages congestion through EIM dispatch by automatically activating constraints as flows on the transmission capacity available to the Energy Imbalance Market, which causes the market to dispatch available bids to provide appropriate reductions in flows as needed to manage the constraints, to the extent that the resources can be effective in managing the constraints, by decrementing resources that contribute to congestion and incrementing resources that can provide counter-flow. The CAISO will not automatically initiate the Unscheduled Flow Mitigation Procedure through the Energy Imbalance Market, but will alert EIM Entities to conditions that the market cannot resolve, which may require the EIM Entity to initiate the procedures under WECC regulations.

The EIM congestion management process uses its effective resources to remove congestion before curtailing any existing schedules. The EIM congestion management process is a cost-based mechanism for curtailing or adjusting schedules to provide imbalance energy to support scheduled flows. Flows resulting from the EIM dispatch will provide counter-flows for congestion, which might support scheduled flows that otherwise would be curtailed through the Unscheduled Flow Mitigation Procedure.

The EIM congestion management, and EIM Entities' use of the Unscheduled Flow Mitigation

Procedure when the Energy Imbalance Market has exhausted its available, effective market bids, may be supplemented by market-to-market and market-to-non-market coordination agreements or dynamic transfers between EIM Entities and other Balancing Authority Areas. Subject to the EIM Entities' dynamic transfer policy, dynamic transfers to EIM Entities may make resources outside the EIM Area available to the Energy Imbalance Market and increase its ability to manage congestion as well as to balance load and supply variations, and thereby reduce the need to utilize the unscheduled flow mitigation procedure.

If a balancing authority initiates the Unscheduled Flow Mitigation Procedure, the procedure prescribes curtailments of e-Tags that are not included in market flows. The CAISO will prescribe curtailment of market flows in the event that EIM energy bids become available that would be effective in managing the applicable constraint and that EIM has not already utilized. The CAISO will continue activation of congested constraints until flows are sufficiently less than the transmission capacity available to EIM. This will ensure that EIM continues to provide the maximum amount of congestion relief possible given its available bids, thereby reducing needs for a balancing authority to initiate Unscheduled Flow Mitigation Procedure.

The WECC Enhanced Curtailment Calculator will receive all tagged transactions involving the EIM Area. Under EIM operations, balancing authorities will be responsible during Unscheduled Flow Mitigation Procedure events for prescribed curtailment of certain types of tagged transactions and coordination with the market flow relief that the CAISO must achieve internally through its market operations. The WECC Unscheduled Flow Mitigation Procedure will be responsible for prescribing curtailment of those tags involving the CAISO for which impacts are not included in EIM flows. These include e-Tags for schedules with external parties that are sourced or sunk in the EIM footprint and e-Tags for interchange transactions from self-scheduled resources.

Dynamic e-Tags for EIM flows will not be updated for EIM dispatch until the end of the operating hour, and will be explicitly not managed by the Unscheduled Flow Mitigation Procedure. Provided that the CAISO is able to obtain flow gate limits from WECC's Enhanced Curtailment Calculator that should be maintained by EIM dispatches, the EIM congestion management process will notify the EIM Participating Resource Scheduling Coordinators through the Automated Dispatch System by 2.5 minutes before the affected dispatch interval of the schedule adjustments due to the constraint, and the shadow price of the flow gate responsible for the curtailment will be available on OASIS.

29.7.6 Load Curtailment

The EIM can dispatch price-responsive demand, such as pump load or exports (on a 15-minute basis) from the EIM Participating Resource Scheduling Coordinators, based on submitted energy bids. The EIM will not dispatch price-inelastic demand; demand management and load shedding may be coordinated between the EIM Entity and the Utility Distribution Companies outside of EIM.

29.7.7 Market Disruption

If a market disruption or a contingency event affects an EIM Entity Balancing Authority Area, the CAISO will maintain the EIM for unaffected EIM Entity Balancing Authority Areas by enforcing a net interchange constraint for the affected EIM Entity Balancing Authority Area to separate it from the EIM Area.

If the CAISO suffers a contingency within its Balancing Authority Area, the CAISO will only dispatch resources in the CAISO's balancing authority area to recover from the disturbance. Resources in EIM Entity Balancing Authority Areas will not be dispatched to assist in that recovery. The CAISO will continue to run the EIM during a CAISO contingency and produce dispatch instructions for resources in EIM Entity Balancing Authority Areas to balance the remaining EIM Area by separating the CAISO from the EIM Area by enforcing a net interchange constraint, set at the last scheduled interchange value before the occurrence of the contingency. In order to excluding the CAISO..

29.7.8 Business Continuity

In the event that the EIM Entity loses communication with the CAISO, the EIM Entity will be responsible for managing its Balancing Authority Area imbalance needs without the EIM dispatch.

29.8. Ancillary Services

Ancillary services are not provided through the EIM and the ancillary services provisions of CAISO Tariff Section 8 applicable to Scheduling Coordinators do not apply to EIM Entity Scheduling Coordinators in that capacity.

Each EIM Entity is responsible for procuring and maintaining its own ancillary services to meet its Balancing Authority Area obligation or obligations to reserve sharing groups.

29.9. Outages

29.9.1 Transmission Outages and Constraints

To the extent that the EIM Entity is a transmission operator within the EIM Entity Balancing Authority Area, the EIM Entity must submit outage information to the CAISO through the outage management system as follows:

- Planned Outages of the transmission facilities must be submitted at least 7 days in advance and preferably up to 30 days in advance of the start of the outage.
- Forced outages of the transmission facilities must be submitted as soon as possible.

The EIM Entity must also specify the critical contingencies that need to be enforced in the EIM. The definition of the contingencies can be done in CAISO's Supplemental Market Data Management. The Scheduling Coordinator for the EIM Entity will update limits on transmission interfaces and scheduling limits as part of the base schedule submission.

Transmission operators within the EIM Entity Balancing Authority Area must specify the network constraints and associated limits that the EIM solution must observe in the EIM Entity Balancing Authority Area network and interties with other Balancing Authority Areas. The limits may be physical MVA or MW limits under base case and contingencies, scheduling limits for intertie transactions based on electronic tags, or contractual limits on transmission interfaces where the EIM Entity Balancing Authority Area has transmission rights.

29.9.2 Resource Outages

The EIM Entity Scheduling Coordinator must manage all of the outages and submit outage information for the non-participating resources in its Balancing Authority Area to the CAISO through the outage management system.

The EIM Participating Resource Scheduling Coordinator must submit outage information for the EIM Participating Resources it represents to the CAISO through the outage management system as follows:

- Planned Outages of the resource must be submitted at least seven days in advance of the start date of the outage and revisions to these planned outages must be submitted whenever their timeline or conditions change.
- Forced Outages of the resource must be submitted as soon as possible.

The EIM Participating Resource Scheduling Coordinator will manage all outages for the participating resources it represents (adjust start/end times, cancel, submit forced outages).

29.10. Metering

29.10.1 Metering Requirements

Telemetry is required for all generating resources in an EIM Entity Balancing Authority Area and all interties, as well as major substations, to produce an accurate State Estimator solution. Small generating units can be aggregated and registered as an aggregate market resource. Metering is required for the aggregated resource.

29.10.2. Settlement Metering

Settlement metering is required for all Generators within an EIM Entity Balancing Authority Area. Generators will have the option to either be a Scheduling Coordinator Metered Entity or a CAISO Metered Entity. The Scheduling Coordinator for a Generator electing to be a Scheduling Coordinator Metered Entity must submit Generation values according to current submittal formats and time periods discussed in the CAISO Metering Business Practice Manual.

The metering data provided by the EIM Entity is deemed to be Settlement quality meter data and must comply with a set of defined standards by the CAISO if no local authority standards exist.

The resources electing to be a CAISO Metered Entity must meet CAISO Tariff and Metering BPM requirements related to a CAISO Metered Entity.

Generating resources in the CAISO Balancing Authority Area and the EIM Entity Balancing Authority Area are required to provide 5-minute metering data.

29.10.3 Interchange Meter Data

Settlement metering is not required for interchange points between an EIM Entity Balancing Authority Area and the CAISO Balancing Authority Area if they are tagged.

The CAISO will utilize e-Tag information for interchange checkout between the CAISO and the EIM Entity. The e-Tag is deemed delivered and is thus equivalent to metering.

The dynamic interchange capacity between the CAISO and an EIM Entity must be tagged but it does not require meter data because it will not be settled; it will only be used for interchange checkout and as an input to the CAISO and EIM Entity's Automatic Generation Control net

scheduled interchange.

The imbalance energy settlement will take place at the resource specific level and requires separate meter data for each resource.

The CAISO requires telemetry data for interchange locations between the EIM Entity Balancing Authority Area and other Balancing Authority Areas as well as e-Tag information -- schedule and originating/receiving Balancing Authority Areas.

29.10.4 E-Tagging

All scheduled energy from imports and exports must be e-Tagged including the awarded imbalance energy of dynamic schedules that crosses Balancing Authority Area boundaries. The e-Tag must reflect the point of receipt and point of delivery that was declared in market bid submittal.

The CAISO uses the WECC Interchange Tool to receive e-Tag information related to the EIM Entity Balancing Authority Area's interchange points with other Balancing Authority Areas that are not within the CAISO Balancing Authority Area.

The CAISO maintains a dynamic schedule with resources in each EIM Entity. Because each EIM Entity Scheduling Coordinator has a balanced schedule at the beginning of each operating hour, the initial energy profile for each of these dynamic schedules will show zero MW at the beginning of an operating hour if these e-Tags represent only imbalance energy dispatched in 5-minute intervals (or may be non-zero if they include schedules for hourly or 15-minute intervals).

Within 60 minutes after the end of each operating hour, the CAISO calculates the integrated energy during the hour for the sum of all EIM dispatches within each Balancing Authority Area, and updates the dynamic schedules with the calculated value for the integrated energy, in accordance with WECC business practices. Any subsequent updates occur within the requirements of WECC, NERC, and NAESB standards and business practices.

29.11. CAISO Settlements And Billing

29.11.1 Imbalance Determination

The hourly base schedule at 40 minutes prior to the operating hour will be the basis for measuring imbalance settlement in the Energy Imbalance Market. The EIM Entity Scheduling Coordinator hourly base schedule, from a settlement basis, is equivalent to a day-ahead schedule (hourly granularity) within the CAISO. Deviations from the base schedule and the 15-

minute market schedule will be settled at the 15-minute LMP.

If updated prior to the 15-minute market, the deviation from the hourly base schedule will be settled at the 15-minute LMP. Until the schedule change is reflected in the 15-minute market, the deviation will settle at the 5-minute LMP.

29.11.2 Settlement of Non-Participating Resources

The EIM Entity Scheduling Coordinator is responsible for the settlement of deviations from resources in the EIM Entity Balancing Authority Area that are not participating in the Energy Imbalance Market.

The CAISO will settle, with the EIM Entity Scheduling Coordinator, deviations at the locational marginal price at the corresponding resources and load. The EIM Entity may choose to pass these charges to the resources/load causing the energy imbalance, or continue to use their existing Hourly Pricing Proxy.

29.11.3 Instructed Imbalance Energy

Instructed imbalance energy is calculated as the algebraic difference between the 5-minute dispatch operating point, which is the dispatch trajectory from the previous 5-minute interval mid-point to the next one, and the base schedule. The instructed imbalance energy is settled in two tiers:

- a) 15-minute instructed imbalance energy; and
- b) 5-minute instructed imbalance energy.

The 15-minute instructed imbalance energy is calculated as the algebraic difference between the 15-minute energy schedule, which is the outcome of Real-Time Unit Commitment, and the 15-minute base schedule for the relevant resource; the 15-minute instructed imbalance energy is settled at the 15-minute LMP.

The 5-minute instructed imbalance energy is calculated as the algebraic difference between the dispatch operating point, which is the outcome of Real-Time Dispatch, and the 15-minute energy schedule for the relevant resource. The 5-minute instructed imbalance energy is settled at the 5-minute LMP.

Resource deviations that are reported to the CAISO as responses to contingency events or EIM

exceptional dispatches will be settled as instructed imbalance energy, rather than as uninstructed deviations by the affected resources.

29.11.4 Uninstructed Imbalance Energy

Uninstructed deviations between the dispatch instruction for a resource and its real-time operating level are settled at the resource's LMP. Resources with financial settlement based on energy delivered in each dispatch interval, with separate price calculations for instructed and uninstructed energy, may be deemed to be settled using cost-based LMPs and not subject to uninstructed deviation charges.

For generating resources, participating loads (i.e., dispatchable pumps and other demand response market resources), and dynamic import/export schedules with external resources, uninstructed imbalance energy is calculated as the algebraic difference between the 5-minute meter data and the dispatch operating point. This uninstructed imbalance energy is settled at the 5-minute LMP.

For static or 15-minute import/export schedules at scheduling points with the CAISO or an EIM Entity, uninstructed imbalance energy is derived from the operational adjustments to the respective hourly or 15-minute e-tags. This uninstructed imbalance energy is settled at the straight average of the three 5-minute LMPs for the relevant 15-minute market interval.

For non-participating load (i.e., loads that are not dispatchable for demand response), uninstructed imbalance energy is calculated as the algebraic difference between the hourly meter data and the base schedule. This uninstructed imbalance energy is settled at the hourly volumetric weighted average LMP of the 15-minute and 5-minute markets in that hour for the relevant Load Aggregation Point. The LMPs will be weighted by the load forecast deviations in the respective markets, but the weighted average will be bounded by the most extreme LMP in the population. The load forecast deviation in a 15-minute market is measured with reference to the corresponding base load schedule for that interval. The load forecast deviation in a 5-minute market is measured with reference to the load forecast that was used to clear the corresponding 15-minute market. Any remaining neutrality charge is allocated based upon the metered demand of the LAP.

29.11.5 Unaccounted For Energy

UFE is treated as imbalance energy and it is the MW neutrality aspect of the respective UDC. Additional discussions are needed to define the specific make-up of the UFE service area for EIM Entities in conjunction with the needed metering points to calculate UFE for each service area. Losses in each UFE are estimated based on the AC power flow solution. Meters are required on all boundary ties of each UDC. UFE in each UDC is calculated as the mismatch between supply/import, demand/export, and estimated losses and the total measured demand

within the UDC area adjusted for distribution losses using distribution system loss factors approved by the local regulatory authority.

Losses in each UFE are estimated based on the AC power flow solution. Meters are required on all boundary ties of each UDC. UFE in each UDC is calculated as the mismatch between supply/import, demand/export, and estimated losses. UFE is included in the Real-Time Market Balancing Authority Area Neutrality calculation and allocation.

29.11.6 Inadvertent Energy Accounting

Each EIM Entity is responsible for tracking inadvertent energy and administering inadvertent payback for its Balancing Authority Area through processes established by WECC.

To assist EIM Entities with accounting for inadvertent energy, the CAISO maintains a dynamic schedule with resources in each EIM Entity Balancing Authority Area. The EIM transfers will not constitute inadvertent energy.

In the EIM Entity Scheduling Coordinator balanced schedule at the beginning of each 15-minute interval, the initial energy profile for each of these dynamic schedules may initially show zero MW that may be zero MW if these e-Tags represent only imbalance energy dispatched in 5-minute intervals (or may be non-zero if they include scheduled energy for hourly or 15-minute intervals).

Within 60 minutes after the end of each operating hour, the CAISO calculates the integrated energy during the hour for the sum of all EIM deviations within each Balancing Authority Area, and updates the dynamic schedules with the calculated value for the integrated energy. Any subsequent updates would occur within the requirements of WECC, NERC, and NAESB standards and business practices.

29.11.7 Charges for Under-Scheduling

Under-scheduling charges are assessed based on the load forecast selected:

- If an EIM Entity elects to use its own load forecast, the EIM Entity Scheduling Coordinator will be responsible for under-scheduling penalties.
- If the EIM Entity elects to use the CAISO forecast and provides sufficient base schedules to meet the CAISO demand forecast, the EIM Entity Scheduling Coordinator will be exempted from under-scheduling penalties because the base schedule has sufficient supply to meet demand.

- If the EIM Entity elects to use the CAISO forecast and does not provide sufficient supply to meet the CAISO load forecast, then the EIM Entity Scheduling Coordinator will be subject to the under-scheduling penalty.

During any hour, the CAISO will assess an under-scheduling charge:

- If an EIM Entity Scheduling Coordinator's load imbalance is more than 4% (but at least 2 MWh) at a load aggregation point, that EIM Entity Scheduling Coordinator is subject to an under-scheduling charge.
- If the reported load is greater than the scheduled load by more than 5% of reported load (but at least 2 MWh) at a load aggregation point, the EIM Entity Scheduling Coordinator will be subject to an under-scheduling charge.
- If the EIM Entity Scheduling Coordinator submits resource schedules outside of this threshold, the process to determine under-scheduling charges applies. In addition, the CAISO adjusts the base load for the hour to match the net supply in the base schedules. This adjusted base load will be distributed net of transmission losses to the load nodes in the relevant load aggregation point using the applicable load distribution factors to yield the adjusted base load, which is the reference for calculating load imbalance for real-time settlement.

The under-scheduling penalties will be collected over a month and allocated to Balancing Authority Areas that have not incurred a penalty in the relevant month.

29.11.8 Uplift Allocations

The CAISO and EIM Entities are responsible for developing their own allocation methodologies for their Balancing Authority Area share of the neutrality accounts or uplifts. Under the combined EIM-CAISO real-time market optimization real-time transfers between Balancing Authority Areas must be incorporated in determining the final Balancing Authority Area offset costs where appropriate.

29.11.8.1 Real-Time Imbalance Energy Offset

The real time imbalance energy offset is a neutrality charge that settles the difference between demand imbalance energy and losses charges/credits and supply imbalance energy and losses charges/credits.

Under EIM, neutrality charges/credits will be recovered through:

- Real-Time Market System Neutrality and
- Real-Time Market Balancing Authority Area Neutrality.

Neutrality charges can be attributed to:

- an excessive rate mitigation measure in the pricing formula for load aggregation points,
- differences between the Load forecast in RTD and actual metered Load,
- uninstructed imbalance energy of generation,
- regulation energy in the CAISO,
- the real-time marginal loss surplus, and Unaccounted for Energy.

The Real-Time System Neutrality accounts for across Balancing Authority Area settlement imbalances whereas the Real-Time Market Balancing Authority Area Neutrality accounts for within Balancing Authority Area settlement imbalances.

The excessive rate mitigation measure ensures that if there are minimal net load deviations over the hour, a single load serving entity is not responsible for settlement of the entire real-time market forecast at a calculated high rate.

The EIM settles total load uninstructed imbalance energy. Load uninstructed imbalance energy is the deviation between the base schedule and meter. The deviation can be further decomposed in to the instructed energy to generation and the load forecast error from RTD. The load forecast error from RTD is settled at the weighted average price. There is not an offsetting settlement of generation. This results in neutrality in a given LAP.

The EIM settles both instructed and uninstructed imbalance energy from generation. Uninstructed imbalance energy of generation is settled at the 5-minute LMP. Uninstructed imbalance energy will be offset by either regulation energy or EIM transfers, or inadvertent transfers. This results in neutrality in a given Balancing Authority Area.

In the EIM Entity, energy that results from units providing regulation is settled as uninstructed imbalance energy at the 5-minute LMP. As a result, for the CAISO, regulation energy is a separate component of the CAISO neutrality account; whereas, the EIM Entity's regulation energy is embedded in the resource's uninstructed imbalance energy. Regulation energy may

be offset by other uninstructed imbalanced energy in the opposite direction. The resulting neutrality from the mitigation measure and RTD forecast error are allocated to the EIM Entity Scheduling Coordinator based upon a load serving entities' hourly metered demand share of total metered demand within the LAP. The neutrality credit or charge is isolated by LAP. The neutrality account distinct for each Balancing Authority Area and for each LAP within each Balancing Authority Area.

The marginal loss surplus is a credit that arises because the marginal loss component in the LMP of resources exceeds actual losses. The difference between marginal loss collected based on the marginal loss component of the LMP and actual loss is included in the neutrality account by Balancing Authority Area.

29.11.8.2 Real-Time Market Balancing Authority Area Neutrality Settlement

The real-time market Balancing Authority Area neutrality is calculated on a 5-minute basis for each Balancing Authority Area. The real-time market neutrality amount is calculated as the sum of the settlement amounts for instructed imbalance energy, uninstructed imbalance energy, unaccounted for energy, real-time net scheduled interface, real-time ancillary service congestion revenues, and convergence bid awards, if applicable, less the Balancing Authority Area real-time congestion balancing account.

The real-time net scheduled interface change settlement amounts represent settlement amounts for the energy which flows between the Balancing Authority Areas as a result of the Energy Imbalance Market. The real-time net scheduled interface settlement amount is calculated as the real-time net schedule interchange direction flow (MWhs) multiplied the LMP of the pricing node at the corresponding intertie.

The real-time market Balancing Authority Area neutrality amount will be adjusted further based upon the 5-minute proportional transfers between Balancing Authority Areas. The proportional amount of the neutrality charge/credit will be transferred between Balancing Authority Areas.

The proportional transfer is determined hourly using 5-minute settlement intervals. It is calculated as the sum of net scheduled interchange (exports from Balancing Authority Area) divided by the sum of absolute value of uninstructed imbalance energy load, the absolute value of supply uninstructed imbalance energy and the scheduled interchange out of the Balancing Authority Area.

In the CAISO, this neutrality account will be allocated to measured demand (metered demand + exports) excluding the dynamic transfers between Balancing Authority Areas. The neutrality account for an EIM Entity Balancing Authority Area will be allocated to the EIM Entity Scheduling Coordinator and then allocated by the EIM Entity according to its tariff.

29.11.8.3 Real-Time Market System Neutrality Settlement

The Real-Time Market System Neutrality shall be calculated on a 5-minute basis for the entire Real Time Market. The Real-Time Market System Neutrality shall account for any non-neutral Settlement amounts which result from across Balancing Authority Area Settlement.

The Real-Time Market System Neutrality amount shall be calculated as the sum of the Settlement Amounts for IIE, UIE, UFE, Real-Time Market Balancing Authority Area Neutrality, Real-Time Ancillary Service Congestion Revenues, and Virtual Awards, if applicable, less the Real-Time Congestion Balancing Account.

This neutrality account will be allocated to metered demand (Load) across the EIM Area.

29.11.8.4 Real-Time Congestion Offset

The real-time congestion balancing account is separate neutrality account for each Balancing Authority Area. The real-time congestion balancing account design ensures that congestion shortages and surpluses resulting from infeasible schedules due to congestion in the EIM Area are allocated to the specific Balancing Authority Area. All resources within the EIM Area that impact an EIM constraint in the infeasible Balancing Authority Area are included in the calculation of the Balancing Authority Area specific congestion balancing account

The neutrality account arises from re-dispatch of generation resources from the base schedule to resolve real-time constraints in each Balancing Authority Area. The impact of a resource on a constraint is measured as the shift factor of the resource to the relevant constraint.

The Balancing Authority Area real-time balancing account is based on the product of the change of binding constraint flow, the base flow, and the shadow price of the binding constraint in the Balancing Authority Area. The contribution can be both positive and negative. Changes in the transmission system between establishment of the hourly base schedule and actual flow result in additional costs that must be recovered through the balancing account.

In the CAISO, the change in flow for a resource is the difference between the day-ahead schedule and meter. For the EIM Entity, change in flow for a resource is the difference between the 15-minute base schedule and meter.

For each constraint in a Balancing Authority Area, the CAISO will sum across all resources in the EIM Area the product of the resource shift factor and change in flow.

The Balancing Authority Area real-time congestion balancing account allocates the cost of infeasible hourly base schedules to the EIM Entity Scheduling Coordinator that submitted the infeasible base schedule directly attributed to constraints within its Balancing Authority Area.

The proposed settlement approach assigns the real-time congestion uplift on EIM Entity Balancing Authority Area constraints into a virtual bucket and physical bucket, and allocates, in direct proportion to out-of-market congestion revenues received by virtual and physical schedules, the physical bucket to the Balancing Authority Area real-time congestion balancing account of the EIM Entity and the virtual bucket to the convergence bid schedules.

If the virtual schedule creates a credit to the out-of-market congestion uplift, then no allocation is made to the virtual schedules. If the virtual schedule creates a charge to the out-of-market congestion uplift, then the virtual bucket is allocated to convergence bid schedules in proportion to each schedule's congestion revenue that is collected through the out-of-market congestion uplift.

Since the CAISO does not model the EIM Entity in the day-ahead market, the CAISO proposes to not settle CAISO convergence bids for real-time congestion due to EIM Entity constraints.

The CAISO will allocate the CAISO Real-Time Congestion Balancing Account to measured demand. The EIM Entity Real-Time Congestion Balancing Account will be allocated to the EIM Entity Scheduling Coordinator and then allocated by the EIM Entity according to its tariff.

29.11.8.5 Real-Time Bid Cost Recovery Allocation

The real-time bid cost recovery contains two cost categories:

- The energy component, which nets energy awards, ancillary services awards, flexible ramping constraint awards, and energy costs over the day. The energy component occurs when a resource receives a financially binding energy schedule or dispatch that is lower than its economic bid.
- Commitment costs, which nets start-up costs and minimum load revenues and costs over the day. Commitment costs are considered in the 15-minute market optimization which in addition to establishing 15-minute schedules will also commit short start units.

Real-time bid costs are netted against real-time revenues over the trade date:

- If revenues exceed costs, a resource receives no bid cost recovery payment.

- If costs exceed revenue for a resource over the day, the shortfall is paid to the resource.

EIM Entities have the option of including unit commitment for their BAA. If an EIM Entity does not elect to have unit commitment in the 15-minute market, the commitment costs are not considered in the market optimization. The EIM Entity must compensate resources that are committed outside of the EIM according to its tariff. No resources in the EIM Entity BAA will be compensated for commitment costs in the EIM. Resources in the EIM Entity BAA can be compensated for real-time bid cost recovery due to the energy component.¹

The CAISO will calculate each component of the real-time bid cost recovery for each Balancing Authority Area. The CAISO will sum the energy cost payments made to resources within the Balancing Authority Area and separately sum the commitment costs made to resources within the Balancing Authority Area. Energy related bid cost recovery within the Balancing Authority Area and transfers between Balancing Authority Areas are allocated to metered demand (Load) in the EIM Area.

Real-time bid cost recovery for resources is calculated on a daily basis. The daily transfers will be the daily sum of the absolute value all uninstructed imbalance energy of load and supply. There is no netting of the two cost categories prior to calculating the financial amount of the transfers of each component. If a category's revenue exceeds its costs over the day, no transfer between Balancing Authority Areas will occur.

If the EIM Entity elects not to allow real-time unit commitment through EIM, no transfer of commitment costs from other BAAs that allow unit commitment in the EIM will occur. If the EIM Entity elects to allow unit commitment through EIM, the unit commitment costs in a BAA will consider the transfers between BAA similar to how the energy cost recovery payments are allocated above.²

The CAISO will combine the energy and commitment components after considering Balancing Authority Area transfers in to a single real-time bid cost recovery allocation amount and will allocate to measured demand. The two components for an EIM Entity Balancing Authority Area will be allocated to the EIM Entity Scheduling Coordinator and then allocated by the EIM Entity according to its tariff.

¹ Grey shaded language is understood to change in the Draft Final Proposal.

² Grey shaded language is understood to change in the Draft Final Proposal.

29.11.8.6 Flexible Ramping Constraint

The CAISO will enforce a flexible ramping constraint requirement for the CAISO Balancing Authority Area and each EIM Entity Balancing Authority Area. Resources across the EIM Area will be eligible for compensation if the resource is used to resolve the flexible ramping constraint.

The costs of resolving the flexible ramping constraint for each Balancing Authority Area will be calculated for each Balancing Authority Area separately based upon the individual Balancing Authority Area requirement. A Balancing Authority Area is only responsible for its associated flexible ramping requirement and not the other Balancing Authority Area requirement even if flexible ramping capability is procured in one Balancing Authority Area to meet another Balancing Authority Area's requirements.

The CAISO will allocate the cost of its flexible ramping constraint based upon the current cost allocation (75% Load, 25% Supply). The cost of the flexible ramping constraint for each EIM Entity Balancing Authority Area will be allocated to the EIM Entity Scheduling Coordinator and then allocated by the EIM Entity according to its tariff.

29.11.9 EIM Initial Fee

The initial fee will be \$0.03 times the total annual energy usage of the EIM Entity Balancing Authority Area, calculated by dividing the total projected costs to implement the Energy Imbalance Market for the entire Western Interconnection by the total annual energy usage of the interchange less CAISO energy usage. The initial fee covers the capital and O&M costs associated with setting up the Energy Imbalance Market. The start-up fee will be established through individual implementation agreements filed with FERC.

29.11.10 EIM Administrative Rate

The EIM administrative rate has two components:

- the real-time market portion of the Market Services charge of the existing GMC, and
- the real-time dispatch portion of the System Operations charge of the existing GMC.

The EIM administrative rate shall be \$0.19 per MWh. The volume the rate is applied to is the gross imbalance energy of both load and generation. There is a minimum volume set at 5% of the gross generation and 5% of the gross load.

EIM revenue will be applied to the CAISO GMC components which reduces the costs that need to be recovered from CAISO market participants as described in Appendix F, Schedule 1, Part A.

29.11.11 Variable Energy Resource Forecast

The cost for the CAISO to provide the variable energy resource forecasting service is currently \$0.10 per MWh. If the EIM Entity has an independent forecast for its variable energy resources and shares its forecast with the CAISO, the \$0.10 per MWh service charge is waived.

29.11.12 Transmission Service

The CAISO shall not charge any transmission service rate or access charge for EIM use of the contractual or ownership rights made available by an EIM Entity. EIM transfers between the CAISO Controlled Grid and an EIM Area using the contractual or ownership rights of an EIM Entity shall not be an Export. This provision shall remain in effect until the CAISO concludes an assessment and stakeholder process taking into consideration the data and information gathered during the first year of EIM operations.

29.11.13 Settlement Schedule

The CAISO shall assess EIM charges and fees in accordance with the settlements and billing process and schedule set forth in CAISO Tariff Section 11.

29.12. Creditworthiness

EIM Entity Scheduling Coordinators and EIM Participating Resource Scheduling Coordinators must comply with the creditworthiness and other requirements of CAISO Tariff Section 12.

29.13. Dispute Resolution

Confirmation and validation of any dispute resolution associated with for the Energy Imbalance Market is subject to CAISO Tariff Section 11.29.8, and shall be managed through the customer inquiry, dispute and information system and as provided in the Settlement and Billing Business Practice Manual. Energy Imbalance Market Participants shall agree to dispute resolution pursuant to CAISO Tariff Section 13.

29.14. Force Majeure, Indemnity, Liabilities, and Penalties

The force majeure, indemnity, liability and penalty provisions of CAISO Tariff Section 14 apply to the Energy Imbalance Market.

29.15. Regulatory Filings

The regulatory filings provisions of CAISO Tariff Section 15 apply to the Energy Imbalance Market.

29.16. EIM Transmission System Registry

Each EIM Entity shall update an ISO registry with the associated static network topology information associated with transmission capacity that it owns, controls or has a contractual entitlement to use no less frequently than the timelines for updates to the Full Network Model as provided in the ISO tariff and business practice manuals. The EIM Entity is responsible for the accuracy and completeness of this information.

29.17. EIM Transmission System Availability

Each EIM Entity shall make available in real time transmission for use in the EIM which is not otherwise encumbered, reserved, scheduled, or being used by its transmission customers or by others. The EIM Entity shall provide the ISO with real time information regarding the availability of its transmission system for use in real time.

29.18. [Not Used]

29.19. [Not Used]

29.20. Confidentiality

The confidentiality provisions in Section 20 of the CAISO Tariff apply to the Energy Imbalance Market.

Each EIM Participating Resource Scheduling Coordinator must execute a Non-Disclosure Agreement with the CAISO in order to access market data that the CAISO provides on the California Market Results Interface that is not publicly available.

29.21. [Not Used]

29.22. Miscellaneous

29.22.1 EIM OATT Provisions

EIM Entities must amend their OATTs to provide for the Energy Imbalance Market consistent with the CAISO Tariff.

29.22.2 Third Party Arrangements

EIM Entities may engage in discussions with third parties, including EIM Participating Resource Scheduling Coordinators, and enter into binding agreements or modify existing agreements with these third parties to implement the approved terms and conditions of the EIM as necessary and appropriate.

29.22.3 Compliance

Each EIM Entity, EIM Entity Scheduling Coordinator, EIM Participating Resource Scheduling Coordinator and EIM Participating Resource shall comply with all federal, state, local or municipal governmental body; any governmental, quasi-governmental, regulatory or administrative agency, commission, body or other authority exercising or entitled to exercise any administrative, executive, judicial, legislative, policy, regulatory or taxing authority or power, including FERC, NERC, WECC; or any court or governmental tribunal, in each case, having jurisdiction over them in connection with the performance of its obligations under the EIM. The current functional responsibilities associated with compliance with reliability standards for each EIM Entity, EIM Entity Scheduling Coordinator, EIM Participating Resource Scheduling Coordinator and EIM Participating Resource are not intended to be modified, changed or otherwise amended as a result of participation in the EIM.

29.22.4 CAISO Tax Liability

To the extent that the CAISO would incur any tax liability as a result of the Energy Imbalance Market, as market operator or as central counterparty to EIM transactions, for example, the CAISO will pass those taxes on to the EIM Entity Scheduling Coordinator for the EIM Entity area where the transactions triggered the tax liability.

29.23. Categories Of Transmission Capacity

The CAISO shall make available for use in the Energy Imbalance Market the transmission

ownership and contractual rights as included in the Master File by the EIM Entity and available in real-time.

29.24. Comprehensive Transmission Planning Process

The Energy Imbalance Market does not include transmission planning related functions and CAISO Tariff Section 24 does not apply.

29.25. Interconnection Of Generating Units And Facilities

The Energy Imbalance Market does not include generator interconnection related functions and CAISO Tariff Section 25 does not apply.

29.26. Transmission Rates And Charges

The CAISO shall not charge any transmission service rate or access charge for EIM use of the contractual or ownership rights made available by an EIM Entity. EIM transfers between the CAISO Controlled Grid and an EIM Area using the contractual or ownership rights of an EIM Entity shall not be an Export.

29.27. CAISO Markets And Processes

The provisions of Section 27 apply to the EIM to the extent of their terms.

29.28. Inter-SC Trades

EIM Entity Scheduling Coordinators and EIM Participating Resource Scheduling Coordinators may not submit inter-SC trades.

29.29. [Not Used]

29.30. Bid And Self-Schedule Submission For All CAISO Markets

The provisions in Section 30 apply to the EIM to the extent of their terms.

29.31. Day-Ahead Market

EIM Entity Scheduling Coordinators and EIM Participating Resource Scheduling Coordinators may not submit bids in the CAISO's Day-Ahead Market.

29.32. [Not Used] Greenhouse Gas

29.32.1 CARB Requirements

EIM Participating Resources must meet CARB registration and reporting requirements.

29.32.2 Bidding

Entities that import energy into California have an obligation to surrender compliance instruments to CARB for the greenhouse gas emissions associated with the energy pursuant to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanism Regulation. In the EIM, only the imbalance energy portion that is imported into California would be subject to a greenhouse gas compliance obligation.

EIM Participating Resources must submit a bid adder which reflects the cost of greenhouse gas compliance. This bid adder can include the cost of allowances, uncertainty on the final resource specific emission factor, and other costs with greenhouse gas compliance.

The combined energy bid and greenhouse gas compliance bid adder will be subject to the market bid cap of \$1,000.00.

The greenhouse gas compliance bid adders are not subject to local market power mitigation.

29.32.3 E-Tag Protocols

The CAISO will create e-Tags as part of the interchange checkout between the CAISO and the EIM Entity. The dynamic interchange capacity between the CAISO and an EIM Entity Balancing Authority Area will be tagged at the aggregate interchange level, but individual e-tags for imports and exports at the resource level will not be created.

The CAISO and the EIM Entity do not create individual e-tags for imports and exports at the EIM Participating Resource level.

Neither the CAISO nor the EIM Entity is a purchasing selling entity for imbalance interchange transactions. Title for energy in the Energy Imbalance Market passes directly from the entity that holds title when the energy enters the CAISO Controlled Grid to the entity that removes the energy from the CAISO Controlled Grid.

29.32.4 Optimization

In order to achieve an efficient dispatch of resources inside the EIM Entity Balancing Authority Area and comply with CARB requirements, the EIM dispatch algorithm will evaluate the differences in greenhouse gas costs that these resources incur so that the energy from among a number of resources with different greenhouse gas bids may be differentiated.

The CAISO will incorporate greenhouse gas emission costs into the dispatch and pricing of the real-time EIM transactions in order to:

- Produce an efficient dispatch that takes into account all appropriate costs including greenhouse gas costs.
- Treat greenhouse gas emission costs in the same manner for energy produced in California and energy produced in EIM Entities outside California and imported into California.
- Produce prices that reflect the marginal cost of serving locational demand taking into account all appropriate costs including greenhouse gas costs.
- Allow individual resources' to submit greenhouse gas compliance bid adders based upon the resource's emission properties and compliance costs. Add the greenhouse gas compliance bid adder to energy produced from those resources that are selected for import into California.
- Comply with CARB requirements, in particular, that energy produced by EIM Participating Resource outside California and imported into California is assignable to the EIM Participating Resource Scheduling Coordinator of the resource that generated the energy.

The CAISO shall modify the Security Constrained Economic Dispatch optimization formulation in the Real-Time Unity Commitment and Real-Time Dispatch to achieve the following:

- Allow the augmented Security Constrained Economic Dispatch optimization to select energy produced by EIM Participating Resources outside California for import into California based upon the resource's greenhouse gas compliance bid adders.

- Include greenhouse gas compliance bid adders in the dispatch cost of EIM Participating Resources outside California that produce energy deemed to be imported into California.
 - EIM Participating Resources outside California that do not emit greenhouse gas and will not be required to procure greenhouse gas allowances would be expected to submit a bid adder at \$0/MWh since their marginal cost of greenhouse gas allowances is zero.
 - EIM Participating Resources outside California that are greenhouse gas-emitting resources will submit non-zero greenhouse gas compliance bid adders. When deemed to import energy into California the resource will have greenhouse gas related costs that are non-zero in the SCED objective function for the portions of their output that is allocated to import energy into CAISO.
 - EIM Participating Resources outside California that are deemed to import energy into California will be assigned greenhouse gas costs that depend upon their emission characteristics.
 - EIM Participating Resources whose energy is deemed to serve load outside California would not be assigned greenhouse gas emission costs.
 - Load in EIM Entity Balancing Authority Areas outside California will not be assessed greenhouse gas emission costs.

The major features of the optimization method are as follows:

- The net imbalance energy export from each EIM Entity Balancing Authority Area, exclusive of import/export imbalance energy schedules to other Balancing Authority Areas, is imbalance energy imported into the CAISO Balancing Authority Area. This energy would be allocated optimally to supply resources in the respective EIM Entity Balancing Authority Area.
- The net imbalance energy export allocation to supply resources in each EIM Entity Balancing Authority Area does not depend on the location of these resources; no shift factors are used in this allocation. Supply resources in each EIM Entity Balancing Authority Area are only differentiated in terms of their respective energy and greenhouse gas compliance costs.
- Each supply resource in an EIM Entity Balancing Authority Area can bid its greenhouse gas compliance cost.

- The greenhouse gas compliance bid for each supply resource in an EIM Entity Balancing Authority Area represents a cost to the respective EIM Participating Resource Scheduling Coordinator for complying and acquiring the necessary greenhouse gas emission credits required by CARB for energy imports to California. This bid is added to the objective function for an efficient cost-effective imbalance energy dispatch.
- The CAISO will report the portion of the 15-minute energy schedule and the portion of 5-minute energy dispatch that is associated with energy imports to CAISO for all EIM Participating Resources as part of the real-time market results publication. The relevant EIM Participating Resource Scheduling Coordinators will be responsible for aggregating and reporting these energy imports to CARB after each calendar year in accordance with CARB regulations.

29.32.5 Settlement

The greenhouse gas LMP component does not apply to resources dispatched in the CAISO Balancing Authority Area or resources in other Balancing Authority Areas that do not participate in EIM because these resources include the cost of greenhouse gas compliance in their energy bids.

If the CAISO deems that the output from an EIM Participating Resource is imported to serve California load, the resource receives an LMP that reflects the marginal greenhouse gas compliance price for transfers to the CAISO.

If the net imbalance energy export from an EIM Entity Balancing Authority Area is negative, there is no associated net imbalance energy export allocation or greenhouse gas compliance cost. Otherwise the net imbalance energy export allocation constraint is binding and it may have a non-zero shadow price.

Greenhouse gas compliance costs are reflected through the net imbalance energy export allocation shadow prices in the locational marginal prices in the EIM Entity Balancing Authority Areas through a fourth component that is the same for all locations in that Balancing Authority Area. This LMP component is negative and can be seen as a cost adder to the marginal energy component to reflect the marginal cost of greenhouse gas compliance in EIM Entity Balancing Authority Areas for energy exported to CAISO. This fourth LMP component is absent or zero for locations in CAISO, and other Balancing Authority Areas that do not participate in EIM, because in these cases the cost of greenhouse gas compliance is included in the energy bids; hence it is already reflected in the marginal energy component.

As a result of the imbalance energy settlement, the CAISO collects greenhouse gas compliance revenue for the net imbalance energy export from each EIM Entity Balancing Authority Area at

the respective net imbalance energy export allocation constraint shadow price. Distributing this revenue back to the optimal net imbalance energy export allocations in addition to the imbalance energy settlement at the LMP would adequately compensate supply resources in EIM Entity Balancing Authority Areas for their energy and greenhouse gas compliance costs without a need for any side payments or uplift.

29.32.6 Data Release

The CAISO will notify the EIM Participating Resource Scheduling Coordinator through the dispatch instruction whether the resource is deemed to have been imported in to California as a result of the EIM optimization. If an EIM Participating Resource is deemed to have been imported in to California by the market optimization, the resource will be compensated at the marginal greenhouse gas cost.

The CAISO reports the portion of the 15-minute energy schedule and the portion of 5-minute energy dispatch that is associated with energy imports to CAISO for all EIM Participating Resources as part of the real-time market results publication.

The CAISO will calculate the output of each EIM Participating Resource that is imported to California. This amount will be reportable to the CARB as part of an annual emissions data report and will be the basis of the greenhouse gas compliance obligation.

29.33. Hour-Ahead Scheduling Process (HASP)

[Application of the the HASP provisions in Section 33 of the CAISO Tariff to the EIM will depend on the Order 764 compliance filing.]

29.34. Energy Imbalance Market

29.34.1 EIM Input Data

29.34.1.1 Resource Plans

The EIM Entity Scheduling Coordinator submits its initial resource plan for an operating day by 10:00 a.m. seven days preceding the operating day. Each EIM Entity Scheduling Coordinator's resource plan is required to offer sufficient energy bid range to serve its obligations at all times. EIM Entity Scheduling Coordinators must satisfy their energy obligations by scheduling energy from third parties and/or having sufficient bids submitted by EIM Participating Resource Scheduling Coordinators for dispatch by EIM with sufficient dispatchable operating range.

The EIM Entity Scheduling Coordinator resource plan covers a seven-day horizon (with hourly detail for each resource) beginning with the operating day, and contains the following:

- Base schedule
- Energy Bid MW range
- Regulation Reserve MW – Up
- Regulation Reserve MW – Down
- Operating Reserve MW – Spinning
- Operating Reserve MW – Supplemental
- Minimum Economic Operating Limit – Resource's economic minimum output for each operating hour, equal to or greater than the resource's minimum capacity.
- Maximum Economic Operating Limit – Resource's economic maximum output for each operating hour, equal to or less than the resource's maximum capacity
- Ancillary service - Plans for resources meeting the EIM Entity's reserve obligation for its Balancing Authority Area or Reserve Sharing Group.

29.34.1.2 Hourly Base Schedules

The EIM Entity Scheduling Coordinator must submit base schedules for all resources within the EIM Entity Balancing Authority Area and any resources outside the EIM Balancing Authority Area with import/export schedules between the EIM Entity Balancing Authority Area and other Balancing Authority Areas. The hourly base schedules do not include load schedules, which will be derived from the CAISO's demand forecast for the EIM Entity Balancing Authority Area, estimated transmission losses, and an assumed load distribution.

The hourly base schedules must include disaggregation of day-ahead import/export schedules between the EIM Entity Balancing Authority Area and the CAISO, and disaggregation of forward export schedules to other Balancing Authority Areas. Base import schedules to an EIM Entity Balancing Authority Area from Balancing Authority Areas other than the CAISO must be submitted at the relevant intertie scheduling points.

The base schedules should balance day-ahead import/export schedules with the CAISO and

the EIM Entity Balancing Authority Area demand forecast; they should reflect all hourly forward market schedules, bilateral contracts, variable energy resource forecasts, and estimated transmission losses.

The hourly base schedule for each resource must be within the economic bid range of the submitted energy bid for each operating hour. Each EIM Participating Resource Scheduling Coordinator shall provide to the EIM Entity Scheduling Coordinator the energy bid ranges (without price information) of its respective resources participating in the EIM. For each resource, the sum of the maximum economic operating limit, regulation reserve MW – up, operating reserve MW – spinning, and operating reserve MW – supplemental shall not exceed the resource’s maximum capacity. The minimum economic operating limit minus the regulation reserve MW – down shall not be less than the minimum capacity, for each operating hour when the resource is operating. The CAISO will recognize periods when the resource is in start-up or shut-down as exceptions.

The EIM Entity Scheduling Coordinators must submit hourly initial base schedules no later than 75 minutes prior to the beginning of each Trading Hour. The base schedule must include the operating hour and at least two subsequent hours.

The EIM Entity Scheduling Coordinator may revise the hourly base schedules based upon the results of the flexible ramping constraint sufficiency test and unresolved congestion up until 40 minutes prior to the start of the relevant operating hour. Updates to the base schedule received prior to the start of the EIM shall be settled according to the EIM Entity’s tariff.

29.34.1.3 Demand Forecast

29.34.1.3.1 CAISO Demand Forecast

- The CAISO shall develop short-term and mid-term forecasts by Demand Forecast Zone within each EIM Entity Balancing Authority Area, separately from the CAISO Balancing Authority Area, to provide input data for RTUC and RTD time horizons. The short-term forecast produces a value every five minutes for the duration of the CAISO’s dispatch horizon, which has five-minute granularity and extends several dispatch intervals out through a 4.5-hour horizon.
- The mid-term forecast produces hourly values for the next hour through the next 7 days. The CAISO aggregates its short-term demand forecasts along with 15-minute schedule updates and static base schedules, including interchange schedules into and out of the EIM Area, to determine the amount of supply to be dispatched by the market for the upcoming dispatch interval.

The 15-minute demand forecast for each of the intervals in RTUC shall be derived based on the

corresponding three 5-minute demand forecasts approximately 40 minutes prior to the starting of 15 minute interval..

The demand forecast shall be based on historical data, applicable meteorological data, and the State Estimator solution. It shall be produced separately for each load aggregation point and then aggregated for each Balancing Authority Area. The costs associated with the gathering and processing of required information to establish the load forecast will be recovered by the CAISO through the EIM administrative rate.

29.34.1.3.2 EIM Entity SC Demand Forecast

The EIM Entity Scheduling Coordinator may opt to provide a non-binding demand forecast as part of the hourly base schedules. The EIM Entity Scheduling Coordinator must provide any such forecasts by 10:00 a.m. for the next 7 days and must update its forecast for each operating hour and the following 6 to 10 hours by at least 75 minutes prior to the start of that operating hour, as part of its hourly base schedule submission.

The EIM Entity Scheduling Coordinator's demand forecast must be net of behind-the-meter generation that is not registered as a resource.

If the EIM Entity Scheduling Coordinator does not use the CAISO demand forecast to submit base schedules for its resources, the process to determine over-scheduling charges and under-scheduling charges will apply.

29.34.1.4 Load Scheduling Requirements

The EIM Entity Scheduling Coordinator must submit balanced base schedules.

The demand included in the EIM Entity Scheduling Coordinator's base schedules is not required to match actual firm demand at each settlement location in each dispatch interval, but EIM Entity Scheduling Coordinators that do not schedule load accurately in aggregate may be subject to neutrality or offset charges in settlements, or other adjustment of imbalance energy payments attributable to inaccurate scheduling, as provided in CAISO Tariff Section 29.11.

29.34.1.5 Energy Bids

The EIM Participating Resource Scheduling Coordinator may submit energy bids for each Trading Hour of a given Trading Day. The energy bids may be submitted after the Day-Ahead Market results are published for that Trading Day, usually by 1:00 p.m. the day before.

The EIM Participating Resource Scheduling Coordinator may subsequently revise or cancel the energy bids up to 75 minutes prior to the start of the Trading Hour, when the real-time market closes.

The EIM Participating Resource Scheduling Coordinator must submit any energy bids no later than 75 minutes before the start of each Trading Hour in which an EIM Participating Resource it represents will participate.

The energy bid consists of several Bid Components, as set forth in the Market Instruments Business Practice Manual. Resource capacity designated for ancillary services or other reliability functions within the EIM Entity Balancing Authority Area will be reserved and not be subject to EIM dispatch. The CAISO will limit EIM dispatch to the capacity range designated in the submitted energy bid.

The EIM Entity Scheduling Coordinator may constrain the EIM dispatch with additional dispatch instructions as needed to maintain shared reserve requirements with other Balancing Authority Areas or to resolve contingencies or reliability issues within the EIM Entity Balancing Authority Area. These dispatch instructions must be reflected in the revised base schedule submitted by the EIM Entity Scheduling Coordinator for the relevant resource.

The energy bids can be a combination of self-schedules without a bid price and a stepwise incremental energy bid curve with up to 10 segments. Energy bid curves must be monotonically non-decreasing for generating resources.

EIM Participating Resources shall be considered self-committed in a particular hour if they have a base schedule or they submit an energy bid and/or an energy self-schedule greater than zero.

29.34.1.6 Intertie Schedules with Other Balancing Authorities

The EIM Entity Scheduling Coordinator must submit intertie schedules with other Balancing Authority Areas at the relevant intertie scheduling points.

- The EIM Entity is responsible for matching e-Tags and managing schedule curtailments at these interties.
- The EIM Entity Scheduling Coordinator must update these intertie schedules, when applicable, as part of the hourly base schedule revision or prior to the start of the 15-minute market.

The EIM Entity may submit an intertie scheduling between the EIM Entity and a neighboring Balancing Authority Area bid indicating that it is available for dispatched on a 15-minute basis if both support economic bidding of 15-minute intertie scheduling under FERC Order 764

The relevant EIM Entity Scheduling Coordinator must submit to the CAISO the corresponding hourly transmission profile and 15-minute energy profiles from the respective intertie tags. The hourly transmission profiles must be submitted hourly at least 40 minutes before the start of the hour.

If an intertie receives a 15-minute market schedule change at 22.5 minutes before the start of actual flow, the EIM Entity Scheduling Coordinator must confirm by updating the energy profile on the e-Tag by 20 minutes before the start of 15-minute interval. If the final 15-minute energy profile on the e-Tag is different than the 15-minute market schedule, this will result in deviations which will be settled at the 5-minute price.

29.34.1.7 Reserve Sharing Schedules

Each EIM Entity is responsible for its DCS compliance, or share of such compliance under the terms of a reserve sharing group agreement. Nothing in the operation of the Energy Imbalance Market prohibits an EIM Entity from continuing to participate in a reserve sharing group or to change the reserve sharing group's procedures. Each EIM Entity and any reserve sharing group in which it participates are responsible for deploying operating reserves and regulation in conformance with NERC and WECC requirements.

The EIM Entity Scheduling Coordinator shall reflect any energy schedules for deployment of reserves in the hourly base schedules, if time permits, or in contingency dispatch instructions, in which case they will be settled in EIM as bilateral (self-scheduled) transactions, with changes in resource output balanced with other changes in resource output or in tagged interchange.

All operating reserve contingencies and resource plan adjustments in response to contingencies shall be immediately reported to the CAISO. Until resource plan updates are received, the CAISO will continue to send dispatch instructions based upon pre-event operating limits. After resource plan updates are received and EIM dispatches reflect the updated self-schedules and operating limits, the CAISO shall account for the dispatches in the Net Scheduled Interchange values that it provides to EIM Entity Scheduling Coordinators.

To the extent a EIM Entity Scheduling Coordinator's actual response differs from the resource plan adjustment, the EIM Entity Scheduling Coordinator must supply a resource plan update showing the actual resources that have deployed during the event by no later than 1:00 a.m. seven days after the operating day in which the event occurred, for settlement purposes.

The EIM Entity Scheduling Coordinator is responsible for truing up deviations for use in EIM settlement. Obligations to update e-Tags that may be required for reserve deployment continue to be governed by NERC and WECC standards and business practices.

If the EIM Entity is a transmission operator and maintains transmission reliability margins as constraints on transmission capacity, the EIM Entity must include this adjustment in the transmission capacity that it reports to the CAISO as being available to EIM.

29.34.1.8 Load Aggregation Points

The EIM Entity is responsible for defining Load Aggregation Points in its Balancing Authority Area.

The expected granularity of the Load Distribution Factors for the EIM Entity Load Aggregation Points and how the CAISO calculates them is determined by the network model. The CAISO is responsible for determining the load distribution factors and uses its forecast of the EIM Entity load to create the Load Distribution Factors.

The mapping of loads to the nodes is done in the CAISO's full network model. The CAISO validates and normalizes the Load Distribution Factors for each Load Aggregation Point to ensure that their sum is 1. Non-conforming loads that do not conform to the default load distribution (e.g. – pumps, auxiliary station load) may be treated as a custom LAP with a separate forecast.

The CAISO maintains a Load Distribution Factor library for the Load Aggregation Points to distribute the corresponding demand forecast to load nodes for power flow calculations. The Load Distribution Factors are based on the State Estimator solution and are maintained for various seasons, day types (e.g., workday, weekday/holiday), and day periods (e.g., on-peak, off-peak).

The CAISO receives data to calculate Load Distribution Factors either directly from meters or, if not available, from the state estimator. For the Energy Imbalance Market, the CAISO calculates Load Distribution Factors for day ahead and hour ahead only.

There will not be two way communication between the CAISO and the EIM Entity Scheduling Coordinator on what their load forecast is at the Load Distribution Factor level. The LAP imbalance is valued at the aggregate LMP price based on the weighted average of the nodal LMPs weighted by the Load Distribution Factors. The EIM Entity Scheduling Coordinator is encouraged to review and verify Load Distribution Factor accuracy.

29.34.1.9 Variable Energy Resource Production Forecast

The CAISO will produce a 5-minute production forecast every 5 minutes separately for each variable energy resource in the EIM Entity Balancing Authority Area based on i) historical data, applicable meteorological data, and the State Estimator solution; or ii) persistent forecast following telemetry of these resources. The forecast shall cover several hours. The CAISO will derive the 15-minute renewable energy production forecast for each of the intervals in RTUC as the average of the corresponding three 5-minute forecasts.

A variable energy resource may submit hourly economic bids while using the 15-minute and 5-minute CAISO forecasts as an upper limit on its energy production. The hourly base schedule submitted by the EIM Entity Scheduling Coordinator must include the output of variable energy resources at hourly granularity.

The EIM Participating Resource Scheduling Coordinator may also submit renewable energy production forecast as rolling 5-minute schedule updates for each variable energy resource it represents for several hours. If such schedules are submitted, the CAISO will use them to determine the 5-minute dispatch.

29.34.1.10 Dynamic Schedules

The CAISO calculates, and EIM Entity Scheduling Coordinator confirms or submits actual values for dynamic schedules to the CAISO within 60 minutes after completion of the operating hour, and will update these values in accordance with WECC business practices via an update to the e-Tag.

29.34.2 Energy Imbalance Market

29.34.2.1 EIM Data and Applications

The CAISO will use the EIM input data, including resource plan data along with the energy bid curves, demand forecasts, and the its state estimator to determine the dispatch instructions for EIM Participating Resources, the resulting Net Scheduled Interchange for the CAISO and EIM Balancing Authority Areas, and Locational Marginal Prices for imbalance energy settlement.

The CAISO will use EIM base portfolios as of 75 minutes prior to the start of the operating hour to establish the initial basis for EIM energy settlements, subject to adjustments for 15-minute intervals. Subsequent instructed or uninstructed deviations will be settled through EIM energy settlements.

The CAISO will perform the EIM optimization using Real-Time Unit Commitment and Real-Time Dispatch.

Real-Time Unit Commitment and Real-Time Dispatch have multi-interval time horizons where the outcome for the first interval in the horizon is financially binding and the outcomes for subsequent intervals are advisory as they are revised by subsequent market runs. Any changes to dispatch resulting from the 15-minute Real-Time Unit Commitment binding interval will be settled as instructed deviations from the base schedules.

The CAISO publishes shall result information as advisory information to enable EIM Entity Scheduling Coordinators to identify future congestion that may result in the need to modify base schedules for submission in later hours.

29.34.2.2 Real-Time Unit Commitment

Real-Time Unit Commitment is a multi-interval Security Constrained Unit Commitment application that optimally commits and schedules resources over successive 15-minute intervals to balance supply and demand in the EIM Area. Real-Time Unit Commitment has multi-interval time horizons where the outcome for the first interval in the horizon is financially binding, whereas the outcomes for subsequent intervals are advisory since they are revised by subsequent market runs.

Real-Time Unit Commitment contains a pre-process before the market optimization to ensure that 15-minute base schedules are balanced and feasible with respect to transmission losses and any congestion within the EIM Entity Balancing Authority Area.

- All congestion is resolved either by adjusting the base schedules or relaxing the corresponding transmission constraint limit in the EIM Entity Balancing Authority Area to the original limit plus the amount of unresolved overload.
- The CAISO relaxes transmission constraints only if no other means of obtaining an initial base schedule is feasible within transmission limitations, and will alert the affected EIM Entity Scheduling Coordinator to this condition.
- EIM Participating Resources with bids are considered self-committed and available.
- Real-Time Unit Commitment may commit and schedule resources in the CAISO Balancing Authority Area to displace higher cost energy from EIM Participating Resources while balancing load deviations and managing transmission congestion.
- No unit commitment decisions are made by RTUC in the EIM Entity Balancing Authority Area.

The unit commitment function of RTUC does not affect the EIM Participating Resources because the commitment status of these resources is given and not optimized.

EIM Entities have the option for their resources participate in the real-time unit commitment. Under this option, participating resources with energy bids may be flagged for optimal commitment in each 15-minute interval subject to applicable inter-temporal constraints; resources with zero base schedules would be assumed offline and available for startup, whereas resources with nonzero base schedules would be assumed online and available for shutdown. For EIM Entities that chose to opt out of unit commitment, the commitment status of their EIM Participating Resources is given and not optimized. Under the no-commitment option, any EIM Participating Resource with an energy bid is considered online. The RTUC produces 15-minute energy schedules and LMPs.³

Real-Time Unit Commitment clears the Energy Imbalance Market every 15 minutes.

- Real-Time Unit Commitment runs every 15 minutes and produces 15-minute schedules and 15-minute LMPs within the EIM Entity Balancing Authority Area and for interchange scheduling points. Interchange schedules with the CAISO Balancing Authority Area are determined in Real-Time Unit Commitment every 15 minutes.
- EIM Participating Resource Scheduling Coordinators that bid into the EIM receive 15-minute schedules from Real-Time Unit Commitment. If the EIM Entity supports 15-minute intertie scheduling, imports and exports (to the EIM Entity Balancing Authority Area from other Balancing Authority Areas) that provide bids for the 15-minute market, it receives 15-minute schedules.
- RTUC does not determine 5-minute dispatch by EIM for intertie bids.

29.34.2.3 Real-Time Dispatch

The CAISO will produce 5-minute dispatch instructions and 5-minute LMPs within the EIM Entity Balancing Authority Area and for interchange scheduling points. The reference for calculating imbalance energy for the 5-minute dispatch will be the corresponding 15-minute energy schedule.

The CAISO shall send the 5- minute dispatch instructions to EIM Participating Resource Scheduling Coordinators that bid into the EIM and to the EIM Entity Scheduling Coordinator.

³ Grey shaded language is understood to change in the Draft Final Proposal.

29.34.3 EIM Optimization

29.34.3.1 Congestion Management

The EIM Entity as a transmission operator must specify the network constraints, including contingencies, and the associated limits that the CAISO needs to enforce in EIM.

The EIM Entity Scheduling Coordinator base schedules must not violate any of these constraints.

EIM Participating Resource Scheduling Coordinators must submit energy bids with sufficient generating capacity in EIM to enable efficient congestion management on these constraints. If an EIM Entity Balancing Authority Area does not have sufficient bids to resolve congestion, the relevant transmission constraints will be relaxed in the market clearing solution and the EIM Entity will become responsible for managing its congested constraints through other means.

The marginal congestion component of the 15-minute and 5-minute LMPs in all locations in the EIM Area will include congestion contributions from binding network constraints within the EIM Area. The marginal congestion revenue from the imbalance energy settlement, net of any Transmission Ownership Rights/Existing Transmission Contract refunds, and net of any liquidation of convergence bids related to congestion in the EIM Balancing Authority Area is allocated through the EIM real-time congestion balancing account.

The EIM dispatches resources only within the EIM Area to meet real-time imbalances. The EIM operates within as available transmission rights that are made available by the EIM Entity.

The CAISO utilizes a network model tool to monitor and control for actual flows within the EIM network. The CAISO coordinates measures, where applicable, to ensure EIM dispatch does not exacerbate constraints affected by loop flow.

29.34.3.2 Flexible Ramping Constraint Requirement

The CAISO determines the flexible ramping constraint requirement for each Balancing Authority Area in the EIM Area.

Each EIM Entity must meet its flexible ramping capacity requirement in the resource plan submitted by the EIM Entity Scheduling Coordinator. The CAISO will review the resource plan and verify that it has sufficient bids for ramping capability to meet the EIM Entity Balancing Authority Area flexible ramping capacity requirement. **If the EIM Entity elects not to allow unit**

commitment in RTUC, then only the bid range of online resources will be considered in calculating ramping capability (resources with economic bids are considered online under this option). If the EIM Entity elects to allow unit commitment in RTUC, then all resources with economic bids and are available for the 15-minute RTUC commitment (online or offline) will be eligible to ensure sufficient ramping capability.⁴

The flexible ramp capacity requirement for each EIM Entity Balancing Authority Area shall include a minimum requirement based upon the transfer capability between Balancing Authority Areas and a maximum requirement based on the difference between the demand forecast and base self-schedules across 15-minute intervals with an additional amount to address the historical variability and uncertainty of both load and supply in the EIM Entity Balancing Authority Area.

The CAISO shall determine the amount of 5-minute flexibility requirements for each Balancing Authority Area individually and then again for the aggregate of the EIM Area according to the following methodology is used to determine the flexibility requirements:

- Develop a daily 5-minute forecast of gross load, wind and solar production.
- Determine a daily 5-minute net load by netting the gross load by the wind and solar production forecasts.
- Develop a series of daily 5-minute net load curves by introducing forecast error uncertainty based on historical forecast error pattern.
- Develop a distribution of the changes in the 5-minute net load by calculating the difference between the net load at time (T+5 minutes) by the net load at time (T) for each 5-minute interval of the day and repeat for the series of net load represent forecast error.
- Analyze the distribution of changes in 5-minute net load and identify the +/-X% confidence level of the distribution. The CAISO uses a 90%-95% confidence level as the appropriate level for establishing the flexible ramping requirement.
- Perform this process individually for each Balancing Authority Area and in aggregate for the combined EIM Area.
- For the purpose of flexible ramping sufficiency test in the EIM Entity Balancing Authority Area, a minimum requirement for the EIM is determined considering the proportional amount of the combined flexibility requirement and the transfer capability into the EIM

⁴ Grey shaded language is understood to change in the Draft Final Proposal.

Entity Balancing Authority Area from other Balancing Authority Areas in the EIM Area.

- For the purpose of procurement on a 15-minute basis, the 5-minute requirements may be aggregated into a 15-minute requirement by summing the three 5-minute interval requirements into a 15-minute requirement for each 15-minute RTUC interval.

The CAISO will apply a ramping sufficiency test for each EIM Entity Balancing Authority Area to verify that the submitted resource plan by the relevant EIM Entity Scheduling Coordinator has sufficient ramping capability to meet the flexible ramping constraint requirement of the EIM Entity Balancing Authority Area in each 15-minute interval. If the ramp sufficiency test fails for an EIM Entity Balancing Authority Area, the CAISO will constrain the net import interchange for that EIM Entity Balancing Authority Area during the operating hour not to exceed the last 15-minute schedule interchange before the hour, effectively not allowing additional imports into that Balancing Authority Area from the rest of the EIM.

The CAISO will calculate the flexible ramping constraint requirement for each Balancing Authority Area individually and a requirement for the EIM Area which recognizes the diversity benefits of the EIM. The diversity benefit will then be allocated to individual EIM Entity Balancing Authority Areas for use in the flexible ramping constraint sufficiency test. The total system requirement will not exceed the sum of the individual Balancing Authority Area flexible ramping constraint requirements.

The individual EIM Entity Balancing Authority Area requirement for the flexible ramp sufficiency test will be calculated as follows:

$$FRR'_i = \max\left(\max(0, FRR_i - NIC_i), FRR_i \frac{TFRR - DB}{TFRR}\right)$$

Where:

- FRR'_i is the flexible ramp requirement for EIM Entity i with diversity benefit;
- FRR_i is the flexible ramp requirement for EIM Entity i without diversity benefit;
- NIC_i is the available net import capability of EIM Entity i , not consumed by base schedules or EIM scheduled transfers prior to the operating hour;
- $TFRR$ is the total flexible ramp requirement for the entire EIM footprint without diversity benefit (the sum of FRR_i for all Balancing Authority Areas in the EIM including the CAISO Balancing Authority Area); and
- DB is the EIM diversity benefit.

The CAISO will perform a series of flexible ramping constraint sufficiency tests prior to commencing the EIM. The EIM Entity Scheduling Coordinator may re-submit the hourly base schedule if it fails the flexible ramping constraint sufficiency test or fails to resolve congestion up to 40 minutes prior to the operating hour.

The sufficiency test will be performed for each EIM Entity Balancing Authority Area after T-75 minutes, T-55 minutes, and T-40 minutes for the Trading Hour starting at T. The CAISO will use the following data to evaluate the hourly base schedule:

- Initial schedules at T-7.5'
- EIM Participating Resources energy bids and ramp rates
- 15-minute flexible ramping requirements reduced by any diversity benefit up to available net import capability at T-7.5'

The sufficiency test is cumulative. The EIM Entity Balancing Authority Area must meet flexible ramping requirements for each 15 minute interval of the hour:

- Interval 1: 15-minute ramp from T-7.5 to T+7.5
- Interval 2: 30-minute ramp from T-7.5 to T+22.5
- Interval 3: 45-minute ramp from T-7.5 to T+37.5
- Interval 4: 60-minute ramp from T-7.5 to T+52.5

Upon completion of the flexible ramping sufficiency test, the CAISO will enforce separate flexible ramping constraints in the market optimization for each EIM Entity Balancing Authority Area, the CAISO Balancing Authority Area, and the entire EIM Area.

Resources across the EIM Area will be eligible for compensation if the resource is used to resolve the flexible ramping constraint.

An EIM Entity Scheduling Coordinator is not required to submit a balanced schedule that includes additional unloaded capacity necessary to meet the flexible ramping constraint.

The combined requirement for the EIM Area may be less than the sum of the individual Balancing Authority Area requirements realizing potential diversity benefits in the EIM Area.

The flexible ramp sufficiency test for an EIM Entity Balancing Authority Area will reflect a pro rata share of the diversity benefits . If the flexible ramping sufficiency test is passed, the market will enforce an hierarchical set of flexible ramping constraints over all Balancing Authority Area combinations to allow the most economic resources across all Balancing Authority Areas to meet the overall requirement reflecting any diversity benefits. Otherwise, the flexible ramping constraint will be enforced separately for an EIM Entity Balancing Authority Area that fails the

flexible ramping sufficiency test and the net import interchange for that Balancing Authority Area will be bounded for the operating hour at the last 15-minute schedule before that hour.

In the CAISO Balancing Authority Area, the CAISO's residual unit commitment process in the day-ahead market ensures sufficient unloaded capacity if the cleared demand is lower than the CAISO forecasted demand. Resources with residual unit commitment awards are required to bid in the real-time market. The CAISO can commit resources in RTUC if additional unloaded capacity is needed.

29.34.3.3 Scarcity

The EIM formulation includes a single power balance constraint for the EIM Area. Imbalance energy scarcity in meeting demand deviations in the EIM Area can manifest because of either insufficient energy bids or inadequate ramp capability. In these cases, the power balance constraint is relaxed at an administrative penalty cost, which should be higher than the bid cap. Then, the marginal energy component of the LMPs is that administrative penalty cost signaling imbalance energy scarcity. The power balance mismatch would actually be made up by regulating resources in each Balancing Authority Area. The associated regulating energy would be settled at the applicable LMP, which would include the administrative marginal energy penalty price.

29.34.4 EIM Activities

From 7 Days to 1 Day prior to the Operating Day

EIM Entity Scheduling Coordinators submit demand forecasts, resource plans, and ancillary service plans with hourly granularity between 10:00 a.m. of the seventh day prior to the start of the operating day and 10:00 a.m. of the day prior to the operating day.

EIM Participating Resource Scheduling Coordinators submit energy bids for upcoming operating hours and days between 10:00 a.m. of the seventh day prior to the start of the operating day and 10:00 a.m. of the day prior to the operating day.

Between 6:00 p.m. of the seventh day prior to the start of the operating day and 6:00 p.m. of the day prior to the operating day, the CAISO posts hourly demand forecasts by load aggregation point. The CAISO updates load forecasts.

On the Day Prior to the Operating Day

EIM Entity Scheduling Coordinators update hourly demand forecasts, resource plans, and ancillary service plans by 10:00 a.m. of the day prior to the operating day.

The CAISO reviews EIM Entity Scheduling Coordinator hourly load forecasts, resource plans, and ancillary service plans upon submission, and notifies an EIM Entity Scheduling Coordinator when its schedules are not balanced. By 1:00 p.m. of the day prior to the operating day, the CAISO will notify effected EIM Entity Scheduling Coordinators of anticipated congestion based on submitted resource plans, in order to allow adjustments to resource plans prior to real-time to mitigate congestion.

Prior to the Operating Hour

By 75 minutes prior to the operating hour, EIM Entity Scheduling Coordinators submit hourly base schedules and resource plans for the operating hour and EIM Participating Resource Scheduling Coordinators submit energy bids and the base schedule for the operating hour for the resources they represent. EIM initial base schedules as of 75-minutes prior to the operating hour establish the initial basis for EIM energy settlements, subject to modification due to unresolved congestion or failure of the flexible ramping constraint sufficiency test.

Updates to energy bids must be submitted no less than 75 minutes prior to the start of the operating hour. The CAISO undertakes bid validations and processing, and makes adjustments to the base schedules as necessary.

By 60 minutes prior to the operating hour, the CAISO notifies the EIM Entity Scheduling Coordinator if unresolved congestion remains and provides results of the flexible ramping constraint sufficiency test on the submitted base schedule.

By 45 minutes prior to the operating hour, the EIM Scheduling Coordinator submits an updated base schedule if necessary. The CAISO notifies the EIM Entity Scheduling Coordinator if unresolved congestion remains and provides the results of flexible ramping constraint sufficiency test on updated base schedule.

By 40 minutes prior to the operating hour, EIM Entity Scheduling Coordinators submit final hourly base schedule for the operating hour. The final base schedule is used to settle deviations in the real-time market.

Through the Operating Hour

By 20 minutes prior to the start of each 15-minute market interval, EIM Entity Scheduling Coordinators submit tagged schedules for static imports and exports .

The dispatch interval begins 7.5 minutes prior to the start of each 15-minute market interval. The CAISO updates the demand forecast for dispatch interval, transfers latest state estimator solution to market system, processes updated variable energy resource forecast and runs the security constrained economic dispatch.

At 5 minutes prior to the start of each 15-minute market interval:

- the CAISO sends dispatch instructions for the middle of the dispatch interval and posts LMPs for the dispatch interval,
- EIM participating resources begin to ramp to achieve dispatch instructions for the middle of the dispatch interval, and
- The CAISO updates Net Scheduled Interchange (NSI) and sends NSI to EIM Entities for the dispatch interval midpoint, for use in managing area control error.

The NSI reflects the impact of congestion management and reserve sharing events. The NSI is assumed to ramp linearly between consecutive dispatch interval midpoints.

In the middle of the dispatch interval, the EIM Participating Resources are at instructed levels.

No later than 15 minutes after each operating hour, the CAISO makes available the LMP for hourly settlement interval for net interchange, including meter settlement locations.

No later than 60 minutes after each operating hour, EIM Entity Scheduling Coordinators update estimated dynamic schedules (other than those with the CAISO) and the CAISO does checkouts among balancing authorities, including dynamic schedules. The CAISO will calculate, and EIM Entity Scheduling Coordinator will submit or confirm, actual values for dynamic schedules to the CAISO no later than 60 minutes after each operating hour, and will update these values in accordance with WECC business practices via an update to the e-Tag.

Updates to Data for Reserve Sharing Event

Immediately following a reserve sharing event in the EIM Entity Balancing Authority Area, the EIM Entity submits Assisting Balancing Authority Area Load to Contingent Balancing Authority

Area Load schedules for each participant involved in the reserve sharing event. The EIM Entity Scheduling Coordinator submits to the CAISO contingency dispatch instructions for resources in the EIM Entity Balancing Authority Area deployed in response to the reserve sharing event, pursuant to the reserve sharing group's criteria.

Until 1:00 a.m. seven days following the reserve sharing event, the EIM Entity has the opportunity to offset the load schedules created by the reserve sharing event by entering resource to load schedules, reflecting generation resources actually utilized to assist in the event.

29.34.5 EIM Output Results

29.34.5.1 15-Minute Energy Schedules

The CAISO will provide the financially binding 15-minute market energy schedules calculated by Real-Time Unit Commitment to the EIM Participating Resource Scheduling Coordinators that represent EIM Participating Resources.

The 15-minute energy schedules are flat energy schedules over the relevant 15-minute interval.

The imbalance energy calculated for the resource in the 15-minute interval will be calculated as the algebraic difference between the 15-minute energy schedule and the 15-minute base schedule for the relevant resource would be settled at the 15-minute LMP.

29.34.5.2 5-Minute Dispatch Instructions

The CAISO will provide the financially binding 5-minute dispatch instructions calculated by Real-Time Dispatch to the EIM Participating Resource Scheduling Coordinators and to the EIM Entity Scheduling Coordinator.

The dispatch instructions will include the dispatch operating target in MW that should be attained at the midpoint of the relevant 5-minute interval, as well as the dispatch operating point, which is the calculated dispatch trajectory from the midpoint of the previous 5-minute interval, considering the resource's static or dynamic ramp rate.

The instructed imbalance energy is calculated as the integral of the algebraic difference between the dispatch operating point and the 15-minute Energy schedule for the relevant resource, and would be settled at the 5-minute LMP.

29.34.5.3 Dynamic Imbalance Schedule to Net Schedule Interchange

As a result of the EIM optimal dispatch to resolve dynamic energy imbalances and congestion management, the net schedule interchange values may change for every 5-minute interval, with ramping within intervals being tracked by the CAISO. The net schedule interchange variation shall be modeled as a dynamic schedule between the CAISO and EIM Entity for AGC control accuracy.

29.34.5.4 OASIS Information

The CAISO will post on OASIS:

- the 15-minute and 5-minute LMPs, calculated by Real-Time Unit Commitment and Real-Time Dispatch for all nodes and LAPs in the EIM Entity Balancing Authority Area.
- the list of binding transmission constraints in the EIM Area in the 15-minute and 5-minute market solutions obtained from Real-Time Unit Commitment and Real-Time Dispatch .
- the relevant limits and associated shadow prices.
- Information regarding binding constraints for advisory intervals.

29.35. Market Validation And Price Correction

The market validation and price correction provisions of CAISO Tariff Section 35 apply to the Energy Imbalance Market.

29.36. Congestion Revenue Rights

EIM Entities, EIM Scheduling Coordinators, EIM Participating Resources, and EIM Participating Resource Scheduling Coordinators are not eligible to receive CRRs under CAISO Tariff Section 35 in that capacity.

29.37. Rules Of Conduct

EIM Entity Scheduling Coordinators and EIM Participating Resource Scheduling Coordinators will be responsible for complying with the Enforcement Protocol to the extent applicable to the Energy Imbalance Energy Market. Failure to follow the applicable guidelines will result in penalties and a disqualification from receipt of Enforcement Protocol proceeds that the CAISO

distributes annually.

29.38. Market Monitoring

The Energy Imbalance Market shall include market monitoring, which services shall be provided by the CAISO Department of Market Monitoring (DMM) and included in the EIM administrative charges. DMM market monitoring activities for the Energy Imbalance Market may include the following:

- Monitoring markets administered by the CAISO for potential ineffective market rules, market abuses, market power or violations of FERC market rules prohibiting provision of false information or market manipulation,
- Coordinating with CAISO business units that review and monitoring the performance and quality of the CAISO markets,
- Providing recommendations about potential market design flaws or ineffective market rules to the CAISO and FERC,
- Performing analysis and review cases to collect information about certain market trends or behaviors, and
- Referring a matter to FERC if DMM determines there is sufficient credible information that a violation of FERC or CAISO market rules has occurred.

29.39. Local Market Power Mitigation

29.39.1. Local Market Power Mitigation Procedure

The CAISO shall apply the Local Market Power Mitigation procedure set forth in CAISO Tariff Section 39.7 to the Energy Imbalance Market, as follows:

- The Real-time LMPM procedure will be applied separately within each EIM Balancing Authority Area by performing tests for constraint competitiveness and bid mitigation only on resources within the same Balancing Authority Area in which a constraint is located.
- Resources shall only be subject to bid mitigation for local market power within the same Balancing Authority Area in which they are located.

- The LMPM procedures shall apply in the Real-Time Unit Commitment runs and may be used to mitigate an EIM Participating Resource multiple times.
- No suppliers participating in the Energy Imbalance Market will be excluded from the three pivotal supplier test used to determine the competitiveness of constraints.
- A separate reference bus will be selected for each Balancing Authority Area for determining shift factors used in LMPM procedures. This reference bus will be selected based on the typography of each Balancing Authority Area, with the goal of selecting a reference bus at which the congestion component of LMPs are least influenced by local market power.
- The CAISO's market power mitigation mechanism shall consist of two parts: mitigation based on LMP decomposition, and dynamic competitive path assessment based on the residual supplier index.
- The CAISO will use the same dynamic competitive path assessment and LMPM methodology to mitigate power for EIM Participating Resources.

29.39.2 Dynamic Competitive Path Assessment

The CAISO will use the dynamic competitive path assessment to determine whether a path is competitive consistent with CAISO Tariff Section 39.7.2..

EIM Participating Resource Scheduling Coordinators must submit information to the CAISO that is necessary to perform dynamic competitive path assessment, such as tolling agreements and other information necessary to determine the amount of supply controlled by each company and its affiliates.

No suppliers participating in the Energy Imbalance Market are excluded from the test used to determine the competitiveness of constraints on the basis that they may be net buyers of energy in the Energy Imbalance Market.

The mitigation reference bus for EIM Participating Resources does not have to be the same as the CAISO's mitigation reference bus. For an EIM Entity Balancing Authority Area with scattered network topology and without a high voltage transmission backbone, the CAISO will use the load distributed slack bus for the EIM Entity Balancing Authority Area as the mitigation reference bus.

The CAISO will not mitigate resource bids and import or export bids for scheduling limit constraints.

29.39.3 LMP Decomposition

After the dynamic competitive path assessment is complete, the CAISO will perform the LMP decomposition using results of the dynamic competitive path assessment along with congestion pricing results of the pre-market run to determine which resources may have local market power due to congestion on an uncompetitive constraint.

For the Energy Imbalance Market, the LMP decomposition will only be triggered if the resource is effective at relieving an uncompetitive constraint within the same Balancing Authority Area in which the resource is located.

Resources within the CAISO are not mitigated due to congestion on uncompetitive constraints in an EIM Entity Balancing Authority Area. Resources participating in the EIM are only mitigated to relieve congestion on uncompetitive constraints within the same Balancing Authority Area in which they are located.

The computation of the two LMP components at each pricing node in the system depends on the reference bus selection. The reference bus should be at a location free of local market power impact. The LMP at such a reference bus will be used to gauge local market power elsewhere. Another choice of the reference bus can be the distributed load bus.

29.39.3 Default Energy Bids

The CAISO will use the methods and standards for setting default energy bids for LMPM in the EIM set forth in CAISO Tariff Section 39.7.

29.40. Resource Adequacy Demonstration For All SCs In The CAISO Balancing Authority Area

The EIM does not include resource adequacy requirements. CAISO Tariff Section 40 does not apply to EIM Entities, EIM Scheduling Coordinators, EIM Participating Resources, and EIM Participating Resource Scheduling Coordinators in that capacity.

29.41. Procurement Of RMR Generation

The EIM does not include procurement of RMR generation. CAISO Tariff Section 41 does not apply to the EIM.

29.42. Adequacy Of Facilities To Meet Operating & Planning Reserve

The EIM does not enforce Generation planning reserve criteria. CAISO Tariff Section 42 does not apply to the Energy Imbalance Market.

29.43. Capacity Procurement Mechanism

The EIM does not include the capacity procurement mechanism. CAISO Tariff Section 43 does not apply to the EIM.

29.44. [Not Used]

Appendix A New Definitions

Energy Imbalance Market (EIM)

A voluntary market to manage transmission congestion and optimize procurement of imbalance energy (positive or negative) to balance supply and demand deviations for the EIM Area through a fifteen-minute market and five-minute dispatch. The EIM includes a 15-minute market and a 5-minute market

EIM Area

The combined CAISO and EIM Entity balancing authority areas.

EIM Entity

A Balancing Authority and transmission service provider that enters into the EIM Entity Agreement to enable the EIM to occur in its Balancing Authority Area.

EIM Entity Agreement

An agreement between an EIM Entity and the CAISO, a pro forma version of which is set forth in Appendix EIM.

EIM Entity Scheduling Coordinator

The EIM Entity, or a third-party designated by the EIM Entity, that is certified by the CAISO and that enters into the pro forma EIM Entity Scheduling Coordinator Agreement under which it is a Market Participant and is responsible for meeting the requirements specified in Section 29 on

behalf of the EIM Entity.

EIM Entity Scheduling Coordinator Agreement

An agreement between an EIM Entity Scheduling Coordinator and the CAISO, a pro forma version of which is set forth in Appendix EIM.

EIM Participating Resource

A resource located within an EIM Entity Balancing Authority Area that is eligible and elects to participate in the EIM as a Market Participant and that enters into the pro forma EIM Participating Resource Agreement under which is responsible for meeting the requirements specified in Section 29.

EIM Participating Resource Agreement

An agreement between an EIM Participating Resource and the CAISO, a pro forma version of which is set forth in Appendix EIM.

EIM Participating Resource Scheduling Coordinator

The participating resource or a third-party designated by the resource, that is certified by the CAISO and enters into the pro forma EIM Participating Resource Scheduling Coordinator Agreement under which it is a Market Participant and is responsible for meeting the requirements specified in Tariff Section 29 on behalf of the resource.

EIM Participating Resource Scheduling Coordinator Agreement

An agreement between the EIM Participating Resource Scheduling Coordinator and the CAISO, a pro forma version of which is set forth in Appendix EIM.

Potential Amended Definitions

CAISO Metered Entity

[revise to include EIM Participating Resources]

CAISO Markets

[revise to include EIM]

Scheduling Coordinator

[revise to include EIM Scheduling Coordinators]

Appendix B

New Pro Forma Agreements

EIM Entity Agreement

EIM Entity Scheduling Coordinator Agreement

EIM Participating Resource Agreement

EIM Participating Resource Scheduling Coordinator Agreement