



**Energy Imbalance Market  
Year 1 Enhancements  
Phase 2**

**Draft Final Proposal**

**September 8, 2015**

# Energy Imbalance Market Year 1 Enhancements Phase 2 Draft Final Proposal

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## 1 Introduction

The Energy Imbalance Market (EIM) is a real-time market to dispatch economic bids voluntarily offered by participating resources to efficiently balance supply, transfers between balancing authority areas (BAA), and load across its footprint. The EIM extends the ISO's real-time market and leverages the FERC Order No. 764 market design changes implemented in May 2014. As such, the EIM includes a fifteen-minute market and five-minute real-time dispatch across the combined network of the ISO and EIM entities.

The EIM Year 1 Enhancements initiative includes proposed design changes to address FERC compliance, commitments made during the original stakeholder process, and to address other issues identified during implementation. The initiative has two phases. The first phase addressed design changes to be implemented when NV Energy joins the EIM in October 2015. These items were approved by the Board in March 2015 and are currently pending in FERC Docket No. ER15-1919. The second phase was to address items that benefit from six months of operational experience with the EIM and items from phase 1 that required additional discussion.

The following lists the items currently being addressed in phase 2.

### ***Items for Board decision in November***

**EIM transfer congestion rent treatment** – Currently, the EIM design splits the congestion rents equally between two EIM BAAs for EIM transfer constraints. The proposed change addresses the situation where the EIM transfer limits and the inertia scheduling limit are not the same. In this situation, the EIM transfer limit located in one EIM BAA and the inertia scheduling limit will be located in another BAA in the EIM will each receive 100% of the congestion rents in its BAA.

**Dynamic competitive assessment for market power mitigation of EIM transfer limits** – In the EIM Go-Live Enhancements, the ISO committed to look at an additional dynamic trigger for including EIM transfer constraints into an EIM BAA in the market power mitigation process. For example, if EIM transfer capability into an EIM BAA exceeds the historical imbalance needs of the EIM BAA, then in those hours the EIM transfer constraints could be excluded from the market power mitigation process. The ISO proposes to that limits on EIM transfers into an EIM BAA be subject to market power mitigation process the same as any other internal constraint.

**Outage reporting to Peak Reliability Coordinator** – Currently, an EIM entity must use the ISO Outage Management System (OMS) to enter approved outages within its BAA. Each BAA is responsible for submitting outage information into the Peak Reliability Coordinator (RC) outage application. The ISO proposes to allow the EIM entity to permit the ISO to submit outage information the entity has entered into OMS to Peak RC.

**Standard base schedule treatment for e-Tags** – During discussion with PacifiCorp and NV Energy, the ISO discovered the need to specify how base schedules should be

established for imports/exports. This decision cannot be at the discretion of the EIM entity, because a base schedule import for one BAA is a base schedule export for the other BAA. Therefore, the ISO has proposed to require EIM entities to include approved, pending, and adjusted e-Tags as valid means to communicate an import/export base schedule to an EIM entity for purposes of imbalance settlement.

***Items that will be monitored to determine if a stakeholder initiative should commence***

**Potential EIM-wide transmission rate** – The ISO committed to begin a review of a potential transmission charge once it had six months of operational data. Potential approaches were discussed in the original EIM stakeholder process in 2013. This document references material from the original stakeholder process and presents the current status. The ISO does not propose to change the structure of transmission rates at this time, and will continue to monitor the analysis discussed below and if needed will commence a new stakeholder process to review the alternatives.

**Flow entitlements for base schedules/day-ahead schedules** – The ISO committed to evaluate adding this functionality if there is a material impact on the constraints within a BAA in the EIM footprint from other EIM BAAs or the ISO. Currently, the real-time congestion offset is allocated based solely upon where the constraint is located. This design change would allocate a portion of a BAA's real-time congestion offset to other BAAs in the EIM footprint if the other EIM BAA's base schedule flows exceed agreed upon flow entitlements. The ISO does not propose to add flow entitlements to the EIM design and will continue to monitor the analysis discussed below.

**Compensation for third parties making capacity available for EIM transfers** – The ISO believes that the EIM transfer cost approach could be expanded to allow third party transmission owners to make available incremental transmission to support transfers. The incremental transmission would increase the transfer capability between BAAs in the EIM footprint. The ISO proposes to continue this discussion as part of the potential EIM-wide transmission rate design discussion or if needed to support a new EIM entity joining the EIM.

***Items to be discussed in a separate stakeholder initiative***

**Long-term greenhouse gas (GHG) design change** – Several stakeholders requested that the ISO evaluate long-term design changes that may require changes in California Air Resources Board (CARB) regulations. The need for a potential long-term design change could arise if EIM transfers into the ISO BAA are limited by the number of EIM participating resources willing to be deemed delivered to the ISO through their GHG bids. The ISO plans to begin a stakeholder initiative later this year to evaluate if the current EIM methodology to reimburse generation outside California for the portion of their output that is deemed delivered to the ISO BAA needs to be modified should PacifiCorp become a participating transmission owner. As a participating transmission owner, all of PacifiCorp's load and generation will clear in the day-ahead market and become part of the ISO BAA.

**Bidding rules on external EIM interties** – Currently, the EIM design allows full discretion to the EIM entity as to whether real-time economic bidding is allowed on intertie scheduling points with BAAs outside the EIM footprint. The ISO plans to hold a stakeholder workshop in Q4'15 to discuss the liquidity in the 15-minute market on the ISO intertie scheduling points. This will allow potential issues that are impacting liquidity to be addressed which will increase the benefits of 15-minute bidding across the EIM footprint. In addition, the ISO will be commencing a stakeholder initiative as part of the PacifiCorp integration activities to complete the full network model implementation on ISO intertie scheduling points.

## 2 Plan for Stakeholder Engagement

Stakeholder input is essential and critical for the success of new initiatives from policy development to implementation. The EIM Year 1 Enhancements stakeholder process will shape the market design and policies through a series of proposals, meetings and written stakeholder comments. Stakeholders should submit comments to [EIM@caiso.com](mailto:EIM@caiso.com). Table 1 below lists the planned schedule for the EIM Year 1 Enhancements Phase 2 stakeholder initiative.

The ISO is committed to providing ample opportunity for stakeholder input into our market design, policy development, and implementation activities.

This initiative assumes a basic understanding on the EIM design which went live on November 1, 2014. Please review the EIM Draft Final Proposal for additional information on the EIM design including: definitions, policy decisions, as well as descriptions of EIM design components such as the resource sufficiency evaluation and EIM settlements. The EIM Draft Final Proposal is posted at

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

Item	Date
Post Draft Final Proposal	September 4, 2015
Stakeholder Conference Call	September 14, 2015
Stakeholder Comments Due	September 22, 2015
Board of Governors Decision	November 5-6, 2015

**Table 1 - Schedule for EIM Year 1 Enhancements Phase 2 Stakeholder Initiative**

### 3 Changes to Issue Paper and Straw Proposal

**Potential EIM-wide transmission rate** – the ISO proposes to provide updates on the analysis presented in the draft final proposal on a regular basis through the Market Performance and Planning Forum (MPPF). Based upon stakeholder comments, the ISO believes that this will provide for additional monitoring through an existing forum versus maintaining a separate stakeholder initiative to review a portion of EIM data. If the data presented justifies commencing a stakeholder initiative, the ISO will work with stakeholders to prioritize this initiative relative to other planned initiatives.

**Flow entitlements for base schedules/day ahead schedules** – the ISO proposes to provide updates on the analysis presented in the draft final proposal on a regular basis through the Market Performance and Planning Forum (MPPF). Based upon stakeholder comments, the ISO believes that this will provide for additional monitoring through an existing forum versus maintaining a separate stakeholder initiative to review a portion of EIM data. If the data presented justifies commencing a stakeholder initiative, the ISO will work with stakeholders to prioritize this initiative relative to other planned initiatives.

**EIM transfer congestion rent treatment** – the ISO clarifies that the location of an EIM internal intertie is not established based upon which EIM entity creates the tag, but which balancing authority area the constraint is located. The real-time congestion offset for an EIM entity is calculated by summing the congestion across all constraints located within its balancing authority area.

**Market power mitigation** – Stakeholders broadly support always including EIM transfer limits into an EIM BAA in the market power mitigation process, similar to any other constraint. Currently FERC authorization is required. The ISO has provided additional description of how EIM transfer limits are tested using the BAA power balancing constraint and proposes to always include EIM transfer limits in the market power mitigation process.

**Bidding rules on EIM external interties** – The ISO is proposing to not require mandatory 15-minute intertie bidding at this time. In addition the ISO is planning a workshop to discuss reasons the ISO FMM liquidity is below expectations. Since FMM liquidity is the primary driver of the benefits of 15-minute economic bidding of imports and exports in the EIM, this workshop will help to ensure that the benefits will exceed the potential shortfalls. In addition, the ISO will be commencing a stakeholder initiative as part of the PacifiCorp integration activities to complete the full network model implementation on ISO intertie scheduling points.

**Compensation for third parties making capacity available for EIM transfers** – the ISO proposes to continue this discussion as part of the potential EIM-wide transmission rate design discussion that may commence based upon the data presented in the MPPF or if needed to support a new EIM entity joining the EIM. The ISO introduced the topic to provide stakeholders with additional understanding how the EIM transfer cost approach from Phase 1 can be used to meet additional policy objectives.

**Outage reporting to Peak Reliability Coordinator** – the ISO clarified that there will be no change in the functional responsibility of the ISO and no assumption of responsibility for the provision of the information to the Peak Reliability Coordinator.

**Standard base schedule treatment for e-Tags** – during discussion with PacifiCorp and NV Energy, the ISO discovered the need to specify how base schedules should be established for imports/exports. This decision cannot be at the discretion of the EIM entity, because a base schedule import for one BAA is a base schedule export for the other BAA. Therefore, the ISO has proposed to require EIM entities to accept approved, pending, and adjusted e-Tags as valid means to communicate an import/export base schedule to an EIM entity for purposes of imbalance settlement.

#### **4 EIM-Wide Transmission Rate**

The June 30, 2015, Issue Paper and Straw Proposal identified four alternative potential transmission service rates, for compensation for EIM's transmission use of EIM, along with principles for comparison of the alternatives:

1. **Reciprocity in Use of Transmission Made Available by Rights-Holders in EIM Entities:** Alternative 1 would continue the existing EIM transmission rate design, which simply relies on the ISO's and each EIM entity's existing transmission access charges (TAC) to collect their transmission revenue requirements.
2. **EIM Transmission Access Charge:** Alternative 2 would modify the existing approach by taking a step toward a regional transmission rate design, by applying a portion of each entity's transmission revenue requirement as a blended EIM TAC. The blended TAC would apply to real-time withdrawals in the ISO and EIM footprints,
3. **Transfer Charge as a Minimum Shadow Price:** This alternative would incorporate a shadow price for transfers between the ISO and EIM entity BAAs, similar to a congestion shadow price.
4. **Transmission Access Charge Applicable to Load and Wheeling:** To maintain comparable treatment among all ISO market participants (a) without regard for participation in EIM, and (b) without regard for scheduling in the day-ahead versus real-time market, the ISO's transmission access charge could be revised to apply only to load and to wheeling schedules (not to exports from the ISO). If this alternative were pursued, similar rate changes to EIM entities' transmission rates would need to be developed.

Further detail on these alternatives can be found in the Issue Paper and Straw Proposal.

FERC has accepted the initial proposal regarding reciprocal transmission charges with other EIM Entity BAAs as being just and reasonable, and not unduly discriminatory. FERC found that EIM transfers are not similarly situated to other ISO exports for the purpose of the transmission rate proposal, and that EIM represents a sufficiently different market structure to justify different rate treatment, including that the ISO has dispatch authority over EIM participating resources in both the ISO's BAA and in the EIM Entity BAAs. The ISO's reciprocal transmission proposal allows for similar treatment of transmission charges when compared with transmission charges



in the ISO market (which assesses the transmission access charge to load-serving entities and a wheeling access charge to exports), except here the market has been expanded to the EIM. FERC generally has not required the elimination of inter-RTO rate pancaking, but has required the elimination of intra-RTO rate pancaking, and found that the elimination of pancaked transmission rates within the EIM promotes more efficient and competitive electricity markets, provides customers in the EIM and ISO access to additional energy supplies, decreases the number of transactions that must pay pancaked rates, and therefore enhances competitive electricity markets in the region, resulting in lower overall energy costs and benefitting the native load customers who largely bear transmission costs.

The Issue Paper and Straw Proposal observed that analyses of EIM's actual benefits have shown that the initial EIM design has indeed produced benefits as expected, and has not revealed operational problems using this transmission rate alternative. Thus, given these actual benefits and FERC's rationale for accepting the initial EIM transmission rate structure, it should be expected that any adoption of an alternative to the existing approach should be premised on demonstrations that the alternative would be superior to this initial rate design, which is alternative 1.

Stakeholder comments on the Issue Paper and Straw Proposal include comments favoring both alternatives 1 and 2, but not alternative 3 or 4.<sup>1</sup> The ISO will use these comments in prioritizing its analyses of the initial four alternatives, to focus primarily on alternatives that receive stakeholder support. One comment identified a fifth alternative: For each operating hour, net EIM transfers across each EIM internal intertie would be calculated and multiplied by the ISO's wheeling access charge for exports from the ISO, or by the applicable transmission provider's hourly non-firm rate for exports from EIM entity BAAs, and then these costs would be allocated to each SC in proportion to their net purchases in the EIM. The ISO will include alternative 5 along with the original alternatives.

The Issue Paper and Straw Proposal also described two types of data on transmission usage within the EIM area during the initial year of EIM operations, which at a minimum, will be considered in comparing the alternative transmission rate designs:

1. The final schedules between EIM entities' and the ISO's BAA are the result of both forward scheduling in the day-ahead market and hourly block schedules in the hour-ahead scheduling process, and real-time EIM transfers using fifteen- and five-minute dispatch intervals. Pre-existing transmission charges apply to the forward schedules, while a potential EIM-wide transmission rate would apply only to the EIM transfers. Comparing transmission usage between these market processes will consider the net impact of EIM transfers.
2. A concern of some stakeholders has been that the EIM's use of a different transmission rate structure than forward scheduling could lead market participants to rely on EIM rather than forward scheduling, thus impacting transmission revenues. Comparing the

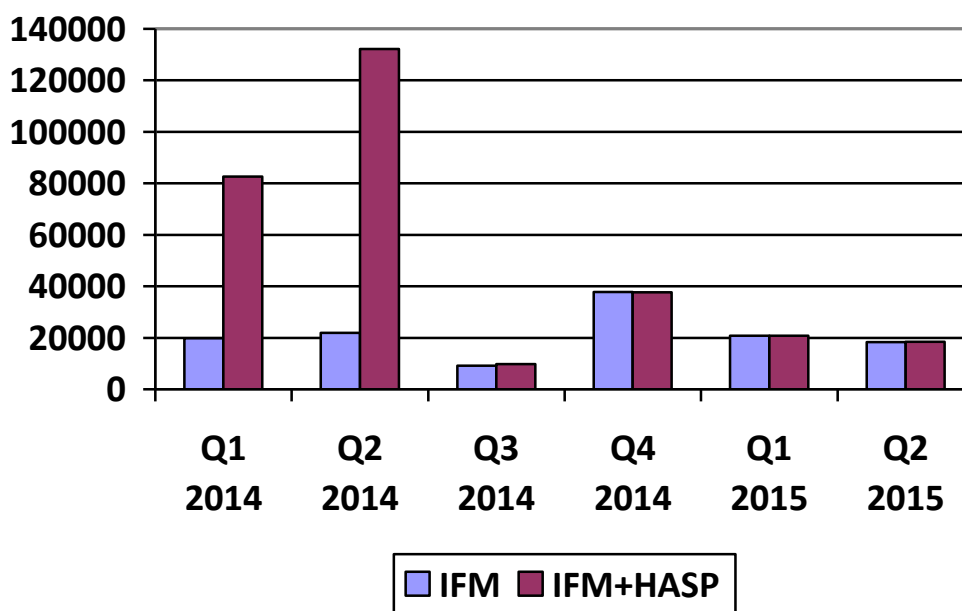
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<sup>1</sup> Specific comments are summarized separately. Some stakeholder comments stated a desire for further analysis before stating positions about specific alternatives.

volume of forward scheduling over time may provide information about the likelihood of this occurring.

In EIM operations to date, there has only been one EIM entity BAA operator (which has operated two BAAs), whose direct pre-EIM participation in the ISO's markets was only a fraction of the ISO market's overall interchange. EIM has created opportunities to significantly expand its real-time market activity, with significant benefits to both the ISO and the EIM participant. However, the history is insufficient at this time to compare the transmission usage of EIM participants under the transmission rate alternatives. What can be compared is the volume of forward market scheduling in the initial months of EIM operation compared to the previous year, as shown in the following graph. The key observation is that the level of day-ahead scheduling has been about the same pre-EIM and post-EIM, i.e., the first two calendar quarters of 2014 versus 2015.<sup>2</sup> Thus, there is no appearance so far that EIM's implementation has reduced forward scheduling, and the ISO does not recommend changes to the transmission rate structure at this time. The ISO will continue to monitor these data series as EIM operations continue, and will periodically report the results to stakeholders and to consider possible changes to the transmission rate structure.

**Table 2**



The ISO also invited proposals for additional analyses, and will consider whether analyses proposed by stakeholders could be completed within the timeframe of this stakeholder process. Stakeholder comments on the Issue Paper and Straw Proposal have not identified specific data

<sup>2</sup> Little can be concluded from higher activity in the hour-ahead scheduling process in the first half of 2014 because this market structure was replaced by 15-minute scheduling in mid-2014. Activity in the third and fourth quarters of 2014 will be compared to 2015 once 2015 data are available, but the 2014 data may be affected by start-up activity of EIM implementation.

items in addition to those identified by the ISO (transmission usage from forward schedules versus EIM transfers, and the volume of forward scheduling before versus after EIM implementation), but some stakeholder comments suggested broader analyses of economic impacts of alternative transmission rate designs. As further operational experience through EIM becomes available, the ISO will determine whether broad analyses of economic impacts are feasible and warranted.

## 5 Flow entitlements for base schedules/day-ahead schedules

Currently the real-time congestion offset is calculated for each EIM BAA based upon the location of the constraint. Under the current design, each EIM BAA is responsible for resolving congestion in its hourly base schedules (or day-ahead schedules for the ISO) within its BAA prior to the start of the EIM. While flows from other EIM BAA base schedules may cause congestion in an EIM BAA, the other EIM BAA does not need to modify its base schedules. In the event that base schedules have unresolved congestion, the EIM will re-dispatch resources to resolve the congestion, resulting in real-time congestion offset uplifts. Flow entitlements would be a settlement mechanism to allocate a portion of an EIM BAA's real-time congestion offset to other EIM BAAs if the other EIM BAA's base schedule flows exceed agreed upon flow entitlements between the EIM BAAs.

Flow entitlements are not easily implemented. The establishment of the flow entitlements must be determined for each selected transmission path either through historical analysis or negotiation. However, the values calculated from historical analysis or negotiated between EIM BAAs may not reflect actual system flows for the operating hour because the flow entitlement cannot reflect changes in system flows caused by transmission or generation outages. The difference between the assumed system flows and actual system flows can undermine the objective of establishing flow entitlements because an EIM BAA is exacerbating the real-time congestion offset in another EIM BAA. Therefore, the ISO would only propose flow entitlements if the benefits of more accurate calculation of real-time congestion offset exceeded the complexity and inaccuracies of enforcing constraints to implement flow entitlements when base schedules are determined.

The initial scope of this analysis is to examine the contribution of PacifiCorp to ISO's real-time congestion offset. In the future, this can be expanded to include the impact of ISO day-ahead schedules on PAC transmission constraints. The analysis focuses on days with large real-time congestion that could cause a significant real-time congestion offset uplift. On these days, the impact of PACW and PACE base schedules on the ISO real-time congestion offset is calculated. The goal of this analysis is to determine if there is a large impact of EIM base schedules during periods of high real-time congestion.

The EIM flow impact from PAC resources is determined across all binding constraints in the ISO:

$$\begin{aligned}
 & \text{for all } |SF_{i,j}| \geq 0.02 \\
 \text{EIM congestion contribution} &= \sum_j \sum_i -(Q_i^{RT} - Q_i^{Base}) \times SF_{i,j} \times \lambda_j
 \end{aligned}$$

$\lambda_j$  = shadow value for constraint j  
 $SF_{i,j}$  = shift factor of node i on constraint j  
 $Q_i^{RT}$  = real-time flow from EIM node i  
 $Q_i^{Base}$  = base schedule flow from EIM node i

If PAC base schedule increase the ISO real-time congestion offset, it is possible to allocate the real-time congestion offset payment to PAC to account for their impact. Then any deviation from the flow entitlement would result in a portion of the cost charged to the neighboring BAA.

*for all  $SF_{i,j} \geq 0.02$*

*if  $(Q_i^{Base} > Q_i^{FE})$*

$$EIM \text{ allocation of } RTCO = \sum_j \sum_i (Q_i^{Base} - Q_i^{FE}) \times SF_{i,j} \times \lambda_j$$

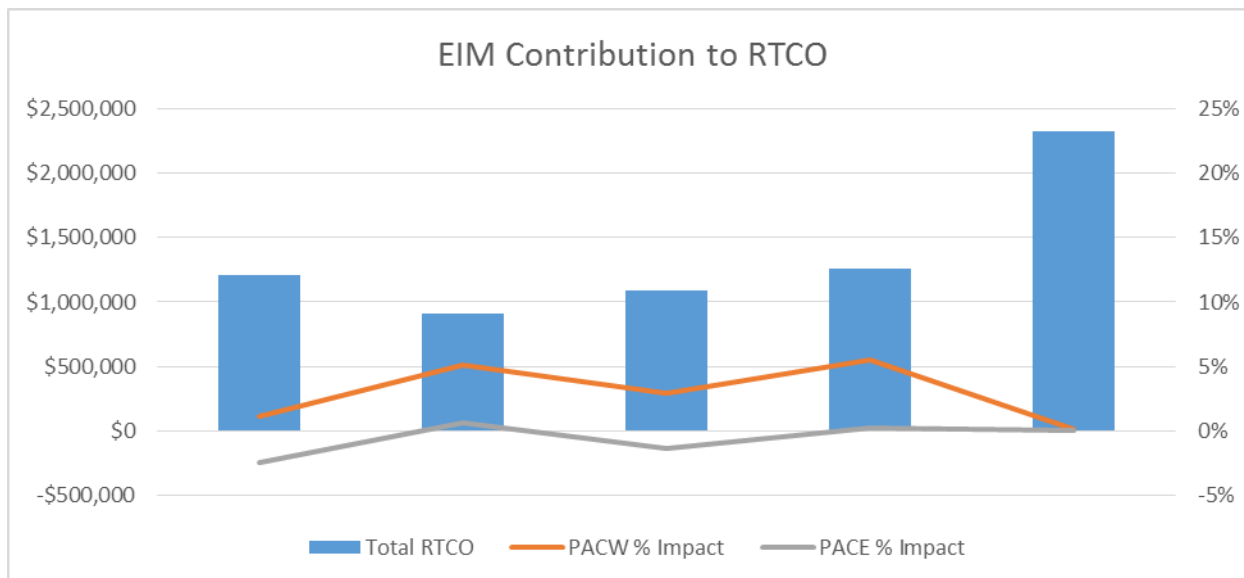
*for all  $SF_{i,j} \leq -0.02$*

*if  $(Q_i^{Base} < Q_i^{FE})$*

$$EIM \text{ allocation of } RTCO = \sum_j \sum_i (Q_i^{Base} - Q_i^{FE}) \times SF_{i,j} \times \lambda_j$$

Supposing a fair flow entitlement that would prevent the one EIM BAA from causing real-time congestion on another EIM BAA, the first EIM BAA would be allocated the real-time congestion offset costs that result from the real-time re-dispatch of resources caused by the over-scheduling or under-scheduling of its flows.

The ISO has conducted preliminary analysis of five of the days resulting in the highest real-time congestion offset for the ISO in 2015. The EIM contribution shown is the real-time congestion offset uplift resulting from differences between FMM flows and base schedule flows. The chart below shows the total ISO real-time congestion offset and the relative impact of PACW and PACE for each day analyzed. PACW added approximately \$165,000 to ISO's \$6.8 million RTCO on these days, contributing to 2.4% of total uplift costs. PACE contributed a net payment of \$35,000 that reduced the RTCO.



The ISO will continue to monitor the possibility of EIM BAAs submitting infeasible base schedules that will significantly increase ISO’s real-time congestion offset uplifts. Future market reports will include the impact of PacifiCorp (and subsequently NV Energy) on other EIM entities’ real-time congestion offset. If the EIM BAA has substantial contributions to another EIM BAA’s real-time congestion offset, then the possibility of flow entitlements could be evaluated.

## 6 EIM transfer congestion rent treatment

In the fifteen-minute market (FMM) and five-minute real-time dispatch (RTD), the market enforces intertie scheduling limits to ensure energy transfer schedules do not exceed transmission path scheduling limits. Intertie scheduling limits are similarly applied to EIM external interties, EIM internal interties, and intertie scheduling points that share both EIM external interties and EIM internal interties. The ISO also enforces EIM transfer limits to ensure that the EIM transfers are within the transmission capability made available by the EIM entity. Since the real-time congestion offset is calculated for an EIM BAA by summing the congestion rents on all constraints located within its BAA, the ISO must determine in which BAA the intertie scheduling limit or EIM transfer limit is located. The proposal below does not change how an EIM entity sub-allocated its real-time congestion offset according to its OATT.

An EIM external intertie is an interface between an EIM BAA and a non-EIM BAA. An EIM internal intertie is an interface between two EIM BAAs, or between an EIM BAA and the ISO. There are two types of EIM internal interties: an interface directly between two EIM BAAs, and an interface which goes through a non-EIM BAA. The first type of EIM internal interties exists between the ISO and NV Energy (NVE) and between NVE and PACE. Currently, the second type exists between the ISO and PACW, and between PACW and PACE.

For the first case, where an interface is directly between two EIM BAAs, the full intertie scheduling limit is available to support EIM transfers in both the FMM and RTD. Stated

differently, the total EIM transfer limit and the intertie scheduling limit use the same limit (whichever is more limiting). No other transactions exist on these interties, except for the energy transfer schedule between the relevant EIM BAAs. For the second case, the intertie scheduling limit will be greater than the EIM transfer limit because the EIM entity has only made available transmission to the intertie scheduling point. An EIM transfer must compete with other market transactions within the intertie scheduling constraint in order for the EIM transfer to cross the intertie scheduling point. In addition, the non-EIM BAA may enforce different limits on the amount of incremental change that can occur in the FMM and RTD. This is the case today with PacifiCorp and Bonneville Power Administration (BPA) and the reason the EIM transfer is tagged as both dynamic and static schedules between PACW and CISO.

Congestion rents are collected on all constraints: intertie scheduling limits, EIM transfer limits, and rate of change constraints. The current design splits congestion rents on EIM transfer limits equally between the two balancing authorities in the EIM footprint. For example, the congestion rents collected on the EIM transfer from PACW to the ISO is split between the two BAAs. However, the EIM transfer from PACW to the ISO must also compete with other market transactions within the intertie scheduling limit. As a result, congestion rents can occur on both the EIM transfer constraint and the intertie scheduling constraint. Since the congestion rents on the EIM transfer are independent of the intertie scheduling limit, splitting congestion rents equally on the EIM transfer constraint is not appropriate.

The ISO proposes the following settlement of real-time congestion rents for intertie scheduling constraints and EIM transfer constraints for two BAAs in the EIM as follows:

- EIM external intertie:
  - 100% to the EIM BAA with which the intertie scheduling point is interconnected
- EIM internal intertie where intertie scheduling limit is less than or equal to the total EIM transfer limit:
  - 50% to each EIM BAA on each side of the EIM internal intertie
- EIM internal intertie where intertie scheduling limit is greater than the total EIM transfer limit:
  - 100% of congestion revenue due to EIM transfer limit to the EIM entity which provides transmission to the intertie scheduling point
  - 100% of congestion revenue due to intertie scheduling limit to the EIM BAA managing the intertie scheduling point

In the event that multiple EIM entities submit EIM transfer limits at a single EIM intertie, the congestion rents will be allocated to each BAA in the same manner as above. For example, assume there are three BAAs. BAA #1 manages the intertie scheduling point with a 1,000 MW intertie scheduling limit. BAA #2 has 200 MW of transmission available to reach the intertie scheduling point. BAA #3 has 300 MW of transmission available to reach the intertie scheduling point. The intertie scheduling limit the congestion rents will accrue to BAA #1. The EIM transfer limit submitted by BAA #2 is 200 MW and these congestion rents will accrue to BAA #2. The EIM transfer limit submitted by BAA #3 is 300 MW and these congestion rents will accrue to BAA #3.

The 200 MW EIM transfer limit for BAA #2 does not necessarily restrict the EIM transfer from BAA #2; assuming that there is another intertie where energy transfer schedules can be tagged between BAA #2 and BAA #3 up to a 100 MW limit, there can be up to 300 MW energy transfer from BAA #2 to BAA #1: 200 MW directly on the shared intertie using the scheduling rights of BAA #2 and 100 MW wheeling through BAA #3 on the shared intertie using the scheduling rights of BAA #3.

Constraints on the net EIM transfer for a given BAA would normally not be enforced in the market; only constraints on the energy transfer schedules on specific interties would be enforced to observe the relevant scheduling limits. Nevertheless, the net EIM transfer may be constrained under the following specific scenarios:

- a) The BAA is in contingency; in which case the net EIM transfer is constrained to its last optimal schedule to isolate the BAA from the rest of the EIM area while the BAA operator responds to the contingency event.
- b) The BAA has failed the flexible ramp sufficiency test, in which case the net EIM transfer is constrained from below (in the import direction) to the optimal 15 min schedule from the FMM for the last 15 min interval before the start of the operating hour, or the base EIM transfer for the hour before the operating hour, whichever greater.
- c) The BAA (only applicable to EIM BAAs) has requested isolation or has initiated separation from the EIM Area.

Constraining the net EIM transfer does not prevent energy transfer wheeling through it. In these scenarios when the net EIM transfer constraint for a BAA is binding, the associated congestion revenues are distributed 100% to that BAA.

The EIM transfer cost used to determine the optimal schedules of EIM transfers between EIM BAAs for tagging will be included in the marginal cost of congestion. As such, the EIM transfer cost will follow the same settlement for congestion rents outlined above.

## **7 Dynamic competitive assessment for market power mitigation of EIM transfer limits**

In the EIM Go-Live Enhancements initiative, the ISO committed to explore additional dynamic triggers for the inclusion of EIM transfer constraints into the EIM area in the market power

mitigation process. A potential example contemplated was if EIM transfer capability into an EIM area exceeds the historical imbalance needs of the EIM BAA. In those hours, the constrained EIM transfers could be excluded from the market power mitigation process. However, if an EIM entity fails the resource sufficiency evaluation, incremental EIM transfers are not allowed in that operating hour. As a result, the assumption that EIM transfer capability will exceed historical imbalance needs cannot be assumed.

The ISO does not believe EIM transfer limits into an EIM BAA should be treated differently than any other internal constraint with regard to market power mitigation. The ISO proposes that, as with all internal constraints within the ISO and within the EIM BAA, aggregated EIM transfer limit into an EIM BAA, which is the EIM BAA specific power balance constraint, will be tested for competitiveness when the constraint is binding. This would obviate the need for a specific structural competitiveness assessment by the Department of Market Monitoring and authorization from FERC to include the EIM transfer limit in the market power mitigation.

In Phase 1, the EIM transfer constraint moved from a single net-scheduled interchange constraint to multiple EIM transfer limits for each intertie scheduling point. The change was needed because, with the addition of NVE, there will be numerous intertie scheduling points which can be scheduled and tagged to account for EIM transfers. EIM transfer limit constraints into an EIM BAA that are included in the market power mitigation procedures are represented in the LMP decomposition by the EIM BAA specific power balance constraints. The shadow price of the BAA specific power balance constraint is equal to the sum of the shadow prices of the relevant set of EIM transfer limit constraints. The shadow price on the EIM BAA specific power balance constraint will be included in the LMP decomposition as either competitive congestion costs or non-competitive congestion costs depending on whether the constraint is deemed competitive or non-competitive.

## **8 15-Minute Economic Bidding on EIM external interties**

Since the EIM is an extension of the ISO's real-time market, 15-minute economic bidding on intertie scheduling points is supported. However, under the current EIM design, the EIM entity determines the rules for participation of resources located within its BAA. This includes imports and exports on external interfaces with non-EIM BAAs, also known as EIM external interties.

The ISO has discussed with stakeholders if this discretion should remain with regards to 15-minute economic bidding on EIM external interties. The ISO has highlighted the following benefits of 15-minute economic bidding:

- Increases liquidity in the FMM,
- Allows load serving entities additional opportunity to hedge imbalance exposure by using resources external to the EIM entity where the load is located, and
- Addresses settlement inefficiencies from different participating rules by EIM entities.



It is important to recognize that 15-minute economic bidding is not a panacea. The ISO has also identified potential shortfalls with 15-minute economic bidding, such as

- Default energy bids are not calculated for 15-minute import/export bids,
- FMM liquidity on ISO interties remains below expectations.
- EIM supports the full functionality of the Full Network Model<sup>3</sup>. This can result in modeling differences used to price intertie scheduling points between the ISO and EIM entity.

The ISO has discussed mitigation measures that would address some of the concerns. For example, in the straw proposal the ISO proposed to allow the EIM entity to gain sufficient operational experience with the EIM prior to intertie bidding being mandated. The ISO believes that it is appropriate that during the transition period pending with FERC in Docket No. ER15-2565 that intertie bidding would not be required. In addition, in the original transition period proposal in December 2014, the ISO contemplated graduated bid caps to minimize the impact intertie bids could have on the price discovery mechanism.

The ISO is proposing to not require mandatory intertie bidding at this time. Since FMM liquidity is the primary driver of the benefits of 15-minute economic bidding of imports and exports in the EIM, this workshop will help to ensure that the benefits will exceed the shortfalls. In addition, the ISO will be commencing a stakeholder initiative, as part of the PacifiCorp integration as a participating transmission owner, to discuss completing the Full Network Model functionality in the day-ahead market.

## **9 Additional items identified during implementation**

### **9.1 Compensation for third party transmission owner to support incremental EIM transfers**

During Phase 1, the ISO modified how EIM transfer limits are implemented. The EIM transfer limit ensures that imbalance energy moved between EIM BAAs is within the transmission capability made available to the EIM. As more BAAs join the EIM, the transfer limits must be considered separately for each intertie scheduling point, not in aggregate for a given BAA. The design change allows for multiple transmission providers to offer available transmission capacity to maximize the EIM transfers between EIM BAAs or through non-EIM BAAs.

Since there will potentially be multiple intertie scheduling paths on which EIM transfers can be scheduled, the ISO included a transfer cost, less than \$0.01 per MWh, in the market optimization to enable the market to select the most optimal path to tag the EIM transfer. The ISO, as the market operator, will determine the appropriate level of the transfer cost. If an EIM entity has multiple intertie schedules that can account for transfers, the ISO will consult with the

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<sup>3</sup> See draft final proposal for discussion of the differences between Phase 1 and Phase 2.  
<http://www.caiso.com/Documents/DraftFinalProposal-FullNetworkModelExpansion.pdf>

entity to determine the appropriate transfer costs to maximize the use of the transmission made available to the EIM.

The ISO believes that the EIM transfer cost approach could be expanded to allow third party transmission owners to make available incremental transmission to support transfers. The incremental transmission would increase the transfer capability between BAAs in the EIM footprint. The incremental transmission made available most likely would be through non-EIM BAAs. However, this feature could not be used to avoid the current reciprocity of not charging for transmission that supports EIM transfers. Unlike the minimal EIM transfer cost to schedule the most direct path, this transfer cost would be settled directly with the third party transmission owner. For example, assume a non-EIM BAA would allow transfers to occur through its system if there is unused transmission in the non-EIM BAA and the EIM would use this transmission at an agreed to rate, such as the non-firm transmission rate. The ISO would then set the transfer cost of the EIM transfer schedule, in this case, equal to the non-firm transmission rate. The market optimization would then use this EIM transfer schedule for tagging the transfer if the benefits of the dispatch exceeded the transfer cost. The transfer cost would then be collected from the market and paid to the non-EIM BAA.

The ISO proposes to continue this discussion either (1) as part of the potential EIM-wide transmission rate design discussion that may commence based upon the data presented in the MPPF or (2) if needed to support a new EIM entity joining the EIM. The ISO introduced the topic to provide stakeholders with additional understanding how the EIM transfer cost approach from Phase 1 can be used to meet additional policy objectives.

## **9.2 Outage Reporting to Peak Reliability Coordinator (RC)**

Currently, an EIM entity must use the ISO Outage Management System (OMS) to enter approved outages within its BAA. Each BAA is responsible for submitting outage information into the Peak Reliability Coordinator (RC) outage application. It is current practice for smaller balancing authorities, to input outage information directly into the Peak RC system which eliminates the need for a separate outage application designed by the balancing authority. The ISO proposes to allow the EIM entity to permit the ISO to submit outage information the entity has entered into OMS to Peak RC. This proposal, similar to the current Base Schedule Aggregation Portal (BSAP), would eliminate the need for the balancing authority to develop its own outage application. The proposal would not change the reliability responsibilities of the EIM entity and no liability would be assumed by the ISO in providing this service.

## **10 Next Steps**

The ISO plans to discuss this draft final proposal with stakeholders during a stakeholder conference call to be held on September 14<sup>th</sup>. The ISO requests comments from stakeholders on the proposed market design changes described in this draft final proposal. Stakeholders should submit written comments by September 22<sup>th</sup> to [EIM@caiso.com](mailto:EIM@caiso.com).