

# **Comments on Energy Imbalance Market Draft Final Proposal**

## **Department of Market Monitoring**

**October 25, 2013**

### **I. Summary**

The Department of Market Monitoring (DMM) appreciates the opportunity to provide comments on the Energy Imbalance Market (EIM) Draft Final Proposal. DMM has worked closely with the ISO and some individual members of its Market Surveillance Committee (MSC) in developing significant portions of the EIM design. DMM has also provided detailed internal comments on each ISO proposal, many of which influenced the final policy. We support the general design of the Energy Imbalance Market, and are providing the following comments and recommendations for the ISO's Draft Final Proposal. We believe these comments can be effectively addressed through a combination of further clarifications of the ISO's final proposal, details that will be specified as part of the implementation process, along with potential future refinements that can be considered based on pre-implementation testing and actual market experience after the initial phase of EIM implementation in the PacifiCorp balancing areas.

### **II. Market Power Mitigation**

The final draft proposal explained that:

Based on the ISO's review of the initial implementation of EIM with PacifiCorp, the ISO believes it will not be necessary or appropriate to mitigate bids for congestion on EIM transfer limit constraints between EIM Entity BAAs. These constraints are deemed to be competitive under the ISO's current LMPM provisions. However, this may be re-assessed based on actual conditions observed once the EIM is implemented or the specific conditions created by other BAAs that may be incorporated in the EIM. The LMPM functionality will allow the EIM transfer limit constraint to be assessed, at a later date, if necessary to address BAA market power (p.27).

The final proposal goes on to note that:

As noted earlier, the EIM transfer constraints could be subject to LMPM if it is determined that EIM Entity BAA market power needs to be addressed (p.30).

DMM has continued to discuss and assess the potential need for additional market power mitigation on an EIM wide level with the ISO and individual members of the MSC. Based on these discussions, DMM and the ISO are proposing to continue to assess the potential for market power on an EIM BAA wide basis as more specific information on the conditions that affect the potential for market power in the EIM become known and available. If this analysis determines that additional market power mitigation is appropriate, DMM understands that the ISO would file to add this provision to the EIM market design in mid-2014, so that this may be in place by the time EIM is implemented in October 2014. In addition, DMM understands that the ISO will also develop the

software capability to apply market power mitigation on an EIM BAA level so that this feature could be implemented before or after initial implementation of the EIM. A more detailed description of this approach and explanation of factors that will be considered when making this determination is provided below.

The degree of structural market power in the PacifiCorp EIM will depend on a number of factors that are uncertain at this point. These include the following three major factors:

- **Transfer capability between EIM BAAs and the ISO.** The ability of PacifiCorp to exercise market power within the two PacifiCorp BAAs can be limited by competition from imports from the ISO. In addition, transfer capacity that can be used to export energy when low cost supplies are available can also deter the exercise of market power by creating an opportunity cost (from lost export sales) in the event market power is exercised within an EIM BAA. However, the amount of transfer capacity available in the EIM between the ISO and the two PacifiCorp BAAs remains uncertain at this time. It also appears the volume of this transfer capacity may be more limited initially and be somewhat dynamic from hour to hour.
- **Non-PacifiCorp generation participating in EIM.** Although there may be a substantial amount of generation within the PacifiCorp BAAs owned by entities other than PacifiCorp, it is also uncertain how much, if any, of this generation will participate in the EIM, particularly in the initial phases. DMM understands that to some extent this may depend on requirements for participating in the EIM set by PacifiCorp.
- **Net demand for imbalance energy from other load serving entities and intermittent resources.** Much (or most) of the imbalance energy met in the EIM may be associated with PacifiCorp's own load and generation deviations. The incentive for the exercise of market power in the EIM will also depend largely on the amount of net imbalance energy demand associated with load and generation deviations by entities other than PacifiCorp, such as other load serving entities (LSEs) and intermittent resources. However, the ISO does not have information on the demand for imbalance energy associated with these entities at this time.

In addition to these basic structural factors, the ability and incentive to exercise market power will depend on a variety of other market conditions which may be highly dynamic and difficult to assess in advance. These include the operating cost of available capacity in the EIM relative to ISO market prices, the level and predictability of ISO market prices, and the predictability of demand for imbalance energy (both incremental and decremental) by other non-PacifiCorp LSEs and intermittent resources.

Given the lack of information on these factors at this point, DMM and the ISO are proposing the following approach to this issue.

- The ISO will also develop the software capability to apply market power mitigation on an EIM BAA level. This would be done subjecting the interconnections between PACE, PACW and the ISO to the three pivotal supplier test when congestion

occurs into an EIM BAA. When the supply of resources within the EIM (less the three major suppliers) was insufficient to relieve this import congestion (i.e. meet the remaining EIM imbalance that cannot be met by imports), the intertie would be deemed uncompetitive in the import direction into the EIM. Under these conditions, mitigation would be applied to bids for all resources that can mitigate this congestion.<sup>1</sup>

- As information on the factors becomes available, DMM and the ISO will continue to assess the potential for market power on an EIM BAA wide basis. After the ISO's initial EIM tariff filing in November 2013, DMM and the ISO will continue to assess the potential for market power on an EIM BAA wide basis as information becomes available. If this analysis determines market power mitigation is appropriate, DMM understands that the ISO would file to add this provision to the EIM market design in mid-2014, so that this may be in place by the time EIM is implemented in October 2014.
- If this analysis indicates it may not be necessary to implement these EIM level market power mitigation provisions initially, this capability will be established in the EIM software so that these rules could be implemented to address any persistent uncompetitive behavior or performance observed once EIM is in operation.

### **III. Flexible ramping sufficiency test**

We support the general design of the flexible ramping sufficiency test. However, we note that the test may not prevent EIM balancing authority areas from leaning on the ISO for capacity in some conditions. Basing the requirements used in the test only on uncertainty in load and variable energy resource forecasts (as described in the final draft proposal) may not be sufficient to prevent EIM participants from deliberately under-scheduling load and over-scheduling variable energy resources in order to lean on the ISO for capacity in times of scarcity. Thus, we recommend the ISO clarify that the formulation of the capacity requirements used in the test will be adjusted to directly account for under-scheduled load and over-scheduled variable energy resources.

For example, assume ISO's forecast for an EIM area is 10,000 MW. The EIM Entity has not secured 10,000 MW of capacity (plus needed reserves) because it has planned on using real-time transfer capacity from the ISO to meet some of its capacity needs during super-peak hours of the year. The EIM Entity submits a base schedule equal to 9,000 MW, and submits economic bids for an additional 500 MW of potential capacity. Based on the EIM area's history of load and variable energy resource uncertainty (i.e. differences in forecast versus actual load and VER output), the ISO sets the BA-specific

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<sup>1</sup> Typically, this would subject all resources within the EIM to bid mitigation. However, bids would not be lowered below the competitive price used as a floor in bid mitigation procedures. DMM is recommending that the market-power-free slack bus used in EIM bid mitigation be the same as that used in mitigating bids when congestion occurs within the ISO. This would ensure that bids in the EIM are not mitigated below a competitive baseline level based on the ISO system marginal energy price.

flexible ramping sufficiency test requirement at 450 MW. The EIM Entity would therefore pass the flexible capacity sufficiency test because it could provide up to 500 MW of additional ramp, exceeding the 450 MW requirement. However, the EIM Entity would not actually have sufficient capacity to meet its own 10,000 MW of load.

The ISO could create better disincentives to capacity leaning by directly adding to the test requirement the amount by which an EIM Entity has under-scheduled load (relative to the ISO's forecast). In the example above, the BA-specific ramp requirement used in the sufficiency test should be 1,450 MW in order to account for both the 1,000 MW load under-scheduling plus the 450 MW of uncertainty in load forecast and variable energy resource output. Based on discussion with the ISO, we believe the ISO plans to implement the ramping sufficiency test in this manner. However, DMM has asked that this be clarified.

Other stakeholders have commented on the generally equivalent possibility of EIM Entities leaning on the ISO for capacity by inflating their variable energy resource forecasts. Assume in the above example the EIM Entity submitted base generation equal to the ISO's forecast for the EIM Entity's load of 10,000 MW. If 3,000 MW of the base schedules come from the EIM Entity's forecasts of its variable energy resource output, but the ISO only forecasts the variable energy resource output to be 2,000 MW, a 450 MW sufficiency test requirement would also be inadequate. At the time of the test, the EIM Entity could only be expected to cover 9,500 of its load with its own resources. The ISO could create better disincentives to capacity leaning by directly adding to the test requirement the amount by which an EIM Entity has over-scheduled variable energy resource output (relative to the ISO's forecast).

Finally, DMM notes that the potential for "capacity leaning" by various entities in the ISO's real-time market exists regardless of the EIM. Specifically, any entity may seek to procure additional exports in the ISO's day-ahead real-time market as an alternative to procuring capacity on a forward longer term basis. While this may be an issue, it appears to be a matter within the purview of other entities such as WECC and various state entities.

#### **IV. Congestion balancing account allocation**

The ISO proposes to calculate the real-time congestion revenue imbalance by constraint and allocate the uplift or credit to the balancing authority area in which the constraint lies. As an adjustment to this underlying proposal, the ISO proposes to protect EIM balancing authority areas from paying out-of-market uplift resulting from congestion on constraints within the EIM to virtual bids scheduled in the ISO's day-ahead market.<sup>2</sup> We support the proposal as a reasonable approach to equitably allocating congestion revenue imbalance.

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<sup>2</sup> See the following paper for more quantitative details and discussion on calculating congestion revenue imbalance by constraint and the virtual allocation proposal:  
[http://www.caiso.com/Documents/DiscussionPaper-Real-timeRevenueImbalance\\_CaliforniaISO\\_Markets.pdf](http://www.caiso.com/Documents/DiscussionPaper-Real-timeRevenueImbalance_CaliforniaISO_Markets.pdf)

The proposal is based on a reasonable principle for who is responsible for adjusting schedules to reduce congestion revenue imbalance caused by scheduled and unscheduled physical flows in the ISO, EIM, and non-EIM balancing authority areas and by ISO virtual schedules. By allocating a constraint's congestion revenue imbalance to the balancing authority area in which the constraint lies, the proposal makes the balancing authority in which the constraint lies responsible for either adjusting schedules to reduce this congestion revenue imbalance, or bearing the uplift cost.

The proposal assigns the portion of the uplift costs associated with EIM constraints that virtual schedules received through out-of-market transactions to virtual schedules. Again, this seems to reflect a reasonable extension of this principle. The ISO, which allows virtual schedules, is still responsible for paying the full cost of congestion revenue imbalance on ISO constraints. Some of these uplift costs allocated to the ISO will be from out-of-market revenues received by physical schedules in EIM balancing authority areas. Similarly, an EIM balancing authority area will be responsible for paying the uplift costs from the out-of-market congestion revenues of its constraints received by physical schedules in the ISO. However, the virtual allocation refinement protects the EIM balancing authority area from paying for the out-of-market congestion revenues received by ISO virtual schedules.

Separating physical schedules from virtual schedules in the treatment of the allocation of congestion uplift is appropriate under the principle of allocating a constraint's congestion revenue imbalance to the balancing authority area in which the constraint lies. ISO physical and virtual schedules can profit from exacerbating the congestion uplift on EIM constraints. Similarly, EIM physical schedules can profit from exacerbating the congestion uplift on ISO constraints. Under the ISO's proposal, the ISO and an EIM Entity agree to be responsible for the adverse impacts that the other's physical schedules may have on net uplift costs.

However, virtual schedules will be able to be placed in unlimited quantities anywhere in the ISO and ISO interties, without being limited by the physical constraints in the EIM balancing authority area. Without the virtual allocation refinement, virtual schedules would therefore be able to profitably exploit real-time congestion that materializes on EIM constraints without risking losses from congestion materializing on those constraints in the ISO day-ahead market. Virtual profits from real-time congestion on EIM constraints would be paid by the EIM balancing authority area through an out-of-market uplift payment. It is unreasonable to ask EIM balancing authority areas to make out-of-market congestion revenue payments to settle ISO financial products.

We support the proposal as a reasonable initial approach to equitably allocating congestion revenue imbalance. However, the possibility exists under the proposal for physical EIM base schedules and physical ISO day-ahead schedules to profit from inflating the base flows of constraints in other balancing authority areas in the EIM footprint. The degree to which this may be problematic will depend on the precise topology of the systems and the effectiveness of injections or withdrawals at particular nodes in one area in impacting the flows on particular constraints in another area.

This issue has been discussed extensively by DMM, the ISO and some individuals on the MSC. These discussions have resulted in the suggestion that the ISO consider adapting a ‘flow entitlements’ structure used in the day-ahead markets of some eastern ISOs to constrain the impacts of flows from one ISO’s schedules on the other ISO’s constraints.

Through our subsequent discussions with the ISO, the ISO has made the following clarifications:

- In the ISO day-ahead market, the ISO includes estimates of external BAAs' real-time base schedules, including EIM and non-EIM Entities. For EIM Entities, the estimated base schedules used may be those submitted by the EIM Entity Scheduling Coordinator or those derived from the load forecast and historical distribution of generation.
- In addition, the ISO can include functionality in the market software to account for flow entitlements of the ISO on EIM Entity BAA constraints and the EIM Entity on ISO constraints. The ISO will seek tariff authority to activate this market functionality if material impacts are observed on each BAA’s real-time congestion balancing account prior to or after October 2014 go-live.

DMM supports the ISO being prepared to implement this type of functionality to represent flow entitlements, should the ISO find that this may be an issue during EIM testing. Going forward, we encourage the ISO and EIM Entities to continue to work towards eliminating the root cause of congestion revenue imbalance by better incorporating flow limits on each other’s constraints into their base and day-ahead schedules.

## **V. EIM transfer limit**

An important aspect of the overall EIM design is the modeling of the power transfers between EIM balancing authority areas, and between the ISO and EIM balancing authority areas. The ISO has described these transfers as dynamic imbalance schedule to net scheduled interchange. The ISO states that it will “calculate the dynamic net schedule interchange for the ISO and each EIM Entity BAA. The Market Operator will also derive from these dynamic net schedule interchanges the dynamic schedules on interties between the ISO and EIM Entity BAAs for tagging purposes.”<sup>3</sup>

The ISO has not clearly defined how these transfers will be modeled and how the limits on the transfers will be determined in the IFM and real-time markets. As previously noted, this lack of a clear definition hampers the ability of DMM to fully assess the overall EIM market design at this time, including the potential need for market power mitigation on an EIM BAA wide level.

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<sup>3</sup> Energy Imbalance Market Draft Final Proposal, pg. 56. Available at: <http://www.caiso.com/Documents/EnergyImbalanceMarket-DraftFinalProposal092313.pdf>

A specific point of uncertainty with regard to modeling is that it is not clear the extent to which the limits on these transfers in real-time will be flow based or scheduling limits. If the limits are flow based, it is not clear how meaningful it will be to enforce a flow based limit set by scheduling rights between EIM balancing authority areas.

The Full Network Model Enhancements should model other unconstrained paths over which power can travel between EIM balancing authority areas, reducing the efficacy of the flow based limit. If the limits between EIM balancing authority areas are scheduling limits, it is not clear how the ISO will determine the quantity of one EIM balancing authority area's real-time net scheduled interchange to schedule as going to the ISO, and the quantity of that net scheduled interchange to schedule as going to another EIM balancing authority area.

Furthermore, the size of the transfer limits between EIM balancing authority areas has policy implications. Lower transfer limits would be beneficial for 'phasing in' the EIM market design. In particular, lower transfer limits could limit the damage of unexpected inequities in the creation and allocation of uplift while the EIM market is in its infancy after go-live. However, higher transfer limits could reduce the scope and magnitude of the potential exercise of market power in EIM balancing authority areas.

We recommend the ISO more clearly define how constraints between EIM balancing authority areas will be modeled and how this modeling will work in the context of the Full Network Model Enhancements as soon as practicable, so that any additional implementation details and enhancements can be developed and reviewed.

Furthermore, we support the ISO testing the appropriateness of the size of the transfer limits between EIM balancing authority areas in conjunction with the Full Network Model Enhancements implementation. We look forward to the ISO reporting and explaining the type of constraints that will be used between EIM balancing authority areas, and the appropriate levels for the limits on those constraints, as part of the EIM and FNM testing process prior to go-live.

## **VI. Greenhouse gas issues**

### *GHG bids*

Numerous stakeholders are concerned that choosing to participate in EIM can ultimately subject them to compliance obligations in California's cap and trade program. The ISO's response to this has been that participation in EIM by suppliers is voluntary and that suppliers participating in EIM could submit very high GHG bids to prevent them from being deemed delivered to California. However, relying on supplier ability to submit high GHG adders could be an imperfect way of preventing them from being deemed delivered to California.

DMM believes it is important to encourage participation by suppliers in EIM, especially if EIM becomes a broader regional imbalance market. While EIM may be voluntary for suppliers, the EIM represents the only source of balancing service offered by BAAs to entities within those BAAs (LSEs, and independent power producers including intermittent renewable generation). Thus, any design feature that limits participation by suppliers ultimately hurts the efficiency and competitiveness of the EIM that these LSEs and intermittent renewable resources will need to rely on for imbalance services. This would be counterproductive to the goal of facilitating increased regional integration and reliance on renewable energy.

At this same time, some other participants have voiced concerns that high priced GHG bids could somehow be used to game the market. DMM believes these concerns may be unfounded, since the ability for bids with high GHG adders to be dispatched for import into California will be limited by competition from resources within the ISO system. Unless the total bid price of these imports (energy plus the GHG adder) is less than the marginal price of energy in the ISO system, they will not be dispatched for import in the ISO and will therefore not be eligible for payment of a GHG adder.

However, it appears these two stakeholder concerns could also be mitigated by modifying the EIM proposal in the following manner:

1. Allow suppliers to choose a flag that excludes them from being included in supply available for export to California.
2. For suppliers allowing their generation to be exported to California, Set a cap on GHG bids tied to each generator's estimated GHG costs (e.g. 150% or 200% of GHG costs calculated using methodology for calculating GHG adder in the DEBs for ISO resources).

DMM understands that these potential modifications may, in practice, have little or not impact on the EIM initially, since most or all resources participating in EIM will be owned by PacifiCorp and will submit GHG bid adders for their capacity. However, DMM encourages the ISO to consider these potential changes as part of further enhancements that could improve EIM participation and performance if additional BAAs join the EIM.

#### *GHG bids for start-up and minimum load*

Stakeholders also raised the issue of GHG costs for start-up and minimum load bids. The ISO's original GHG proposal did not seem to address these issues since unit commitment was not part of the EIM proposal at that time. It seems the GHG proposal can address this by applying GHG bids to minimum load and energy above minimum load. Since the California Air Resources Board (CARB) assesses GHG emissions for imports using emission rates based on a generating unit's total output over a 12 month period, it does not seem appropriate to apply GHG costs to startup bids or to use a different GHG bid for minimum load energy.



### *Rescission of GHG payments for non-performance*

Some participants have also raised the issue that payment of GHG costs based on dispatches (vs. actual generation) can create an economic incentive for EIM units not to generate when dispatched to provide energy that is identified as being imported into California. However, the ISO has indicated that the California Air Resources Board will require EIM units to submit compliance instruments for the MWs that the ISO deems imported to the ISO. Thus, generating units deemed to have been dispatched to generate energy imported into California will receive GHG payments for the same quantity of MWs used to determine their GHG compliance obligations. DMM believes this would effectively mitigate this concern.

### **VII. Real-time imbalance energy neutrality**

We support the ISO calculating the energy portion of revenue neutrality by balancing authority area, with some adjustments to account for energy transfers between balancing authority areas. In particular, we support directly re-distributing the neutrality surplus received by BAAs for their real-time net scheduled interchange transfer *in*. The energy component of the LMP for each MW transferred in by such a BA should be distributed to the BAAs who had their real-time imbalance energy neutrality charged due to their real-time net scheduled interchange transfer *out*.

We have some comments about the ISO's proposal to further adjust the allocation of the real-time imbalance energy neutrality between balancing authority areas based upon "the 5-minute proportional transfers between BAAs." The specific ratio the ISO proposes to use for calculating the proportion of one BAA's neutrality account to allocate to other BAAs adheres to cost-causation principles with regards to some causes of real-time energy revenue imbalances. However, for other causes, the proposed allocation may not be in the correct direction. EIM BAAs with transfers out may sometimes be causing real-time revenue imbalances, yet the allocation proposal is to always allocate neutrality charges from EIM BAAs with transfers out, to EIM BAAs with transfers in.

We recommend that the ISO monitor the extent to which the use of the 'proportional transfer' ratio is allocating real-time energy revenue imbalances according to cost-causation principles. The ISO should eliminate reallocating revenue imbalances according to this proportional transfer ratio if problems are detected.

### **VIII. Bid cost recovery allocation**

We have similar comments about the definition and application of the 'proportional transfer' ratio for reallocating bid cost recovery between BAAs. The ISO should monitor the effectiveness, in terms of cost-causation principles, of allocating a proportion of a BAA's real-time bid cost recovery to other BAAs using the proposed proportional transfer ratio. We recommend the ISO continue to develop alternatives for equitably

distributing BCR amongst BAAs, and be prepared to adjust the allocation if the ISO finds the proposed allocation is not aligning with cost-causation principles.