

**Southern California Edison**  
**Stakeholder Comments**

**Energy Imbalance Market**  
**Revised Straw Proposal**  
**issued May 30, 2013**

<b>Submitted by</b>	<b>Company</b>	<b>Date Submitted</b>
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The following are Southern California Edison’s (SCE) comments on the California Independent System Operator’s (CAISO) Design Straw Proposal and Issue Paper (Proposal) for an Energy Imbalance Market (EIM) issued on May 30, 2013.<sup>1</sup> SCE shares the CAISO’s goal to create a robust set of rules and processes for other balancing authorities to participate in a combined EIM that can result in operational and cost benefits to all parties. However, SCE is concerned that the current schedule lacks the time necessary to properly evaluate the proposal and consider potentially superior alternatives.

Given the time restriction, SCE limits comments to the following issues:

- Schedule lacks sufficient time for careful review and constructive comments.
- Other proposals need to be evaluated to reflect GHG cost in the EIM.
- The EIM Proposal appears to be incompatible with convergence bidding.
- Investigation of situations that create up uplifts needs careful review.
- The role of resource adequacy for EIM Entities requires more discussion.
- Transmission pricing needs to align incentives between day-ahead and EIM participation, and a process for resolution is needed.
- More detail on the modeling and operation of interfaces between the ISO and the EIM entity is needed.
- More detail on the Minimum Shift Optimization is needed.

SCE continues to review other aspects of the EIM Proposal. Lack of comments on specific issues here does not necessarily constitute endorsement.

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<sup>1</sup> <http://www.caiso.com/Documents/RevisedStrawProposal-EnergyImbalanceMarket-053013.pdf>. In addition, the CAISO held a meeting on June 6, to review the proposal with the following presentation: [http://www.caiso.com/Documents/Agenda\\_Presentation-EnergyImbalanceMarketJun6\\_2013.pdf](http://www.caiso.com/Documents/Agenda_Presentation-EnergyImbalanceMarketJun6_2013.pdf)

## **1. Schedule lacks sufficient time for meaningful review and comment**

It is clear from the recent Proposal that the creation of an EIM market with PacifiCorp (or other interested parties) is not a simple extension of the current CAISO tariffs and operations onto EIM participants. The latest draft presents a solution to deal with greenhouse gas (GHG) emission costs that creates a fundamentally different locational market price (LMP) for the EIM Entity than compared to LMPs in the CAISO.<sup>2</sup> In addition, the Proposal introduces market power mitigation, allocation of uplifts, proposals for transmission service, flexible ramping constraints, and minimum shift optimization. Yet parties only have eight days from the CAISO's stakeholder meeting to understand the issue presented in a 64 page document and then provide comments. This is simply not enough time to understand the implications of the CAISO's proposal and provide meaningful recommendations or alternatives for stakeholder review.

The risk of designing a deficient or defective EIM market that may impact large portions of the Western Electricity Coordinating Council is too important to rush simply to make an arbitrary deadline. SCE also recommends parties have time to review comments from others, as well as the original Proposal, and offer additional comments. While this might delay the implementation by some nominal period, the benefit of issue identification and resolution clearly justifies a delay. Better to plan well now and avoid possible future costly mistakes.

SCE recommends parties have four additional weeks to review both the CAISO's Proposal as well as the stakeholder comments proffered in this round of review. The CAISO should then review this second round of comments before making revisions to the current proposal.

## **2. Other proposals need to be evaluated to reflect GHG cost in the EIM**

SCE is still evaluating the CAISO's and other possible solutions to incorporate GHG into the function of the EIM market. At this point, SCE does not support or oppose the current solution proposed by the CAISO.

The CAISO's proposal to introduce GHG costs into the EIM market relies on a process that allocates (or deems) the output of an EIM participant to remain within the EIM Entity or

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<sup>2</sup> Example 1 in the Proposal (p54) shows that the LMP's in EIM Entity would not recover their costs, and therefore requires a separate payment.

be deemed as an export into the CAISO (or some combination of both). We refer to this as an “accounting based” proposal. This results in the creation of a locational market price (LMP) in the EIM Entity that has a different economic meaning from an LMP in the CAISO’s market. For instance, Example 1’s LMP for G2 in the EIM Entity is insufficient to cover the cost that was allocated to be exported to the CAISO.<sup>3</sup> The proposed solution is an additional payment not included in the LMP.

In addition to the “accounting based” proposal for GHG, the CAISO should also explore a “flow based” approach, as described below. With at least two proposals developed to a comparable level of detail, stakeholders can compare the pros and cons, and implications of alternative approaches, or perhaps even identify a superior solution. We strongly encourage the CAISO to explore at least this additional option before making a final decision on any approach.

#### **Description of a possible “flow based” approach to GHG**

A “flow based” approach requires the CAISO to determine, for each generator in the EIM Entity, how much of its power flows into California. Assuming EIM Participants bid production costs without any consideration of GHG, the optimization would then automatically increase EIM bids to reflect the cost of any GHG obligation based upon the flow into California.

Once bids are adjusted, the optimization functions exactly as today. That is, LMPs in both the CAISO and the EIM continue to have just three components (System Energy, Losses, and Congestion). Generation receives payments based on their local LMP times their production. For units dispatched, their LMPs will be at least as high as their submitted bids.

Unlike the CAISO proposal:

- Physics and market economics determine both power flows and GHG obligation,
- Generation requires no additional “GHG payments” or export allocation payments (as all LMP’s already reflect the cost of GHG),
- LMP price signals remain transparent (no separate pricing to specific units “deemed” to sell to California), and,
- The CAISO does not have to “deem” any particular unit as delivering to California while potentially deeming its electrically connected twin as serving the EIM Entity.

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<sup>3</sup> Page 54 of the CAISO’s Energy Imbalance Market Revised Straw Proposal dated May 30, 2013.

To see conceptually how a “flow based” approach works, consider again Example 1 of the revised proposal.<sup>4</sup> Assume the bids and operating characteristics for G1, G2, and G3 remain the same as in the CAISO’s example. In a “flow based” approach, the CAISO would first determine, from the perspective of the optimization’s power flow, what percentage of output from each EIM generator flows to California (net flow based on all interconnections). For simplicity, assume G2 and G3 are electrically similar (e.g. they are on the same bus) and 25% of their output flows into California<sup>5</sup>. Thus, for every 1 MWh scheduled by the EIM, these units will accrue a GHG obligation of one-fourth their output times their GHG emissions factor. This will be translated into a “GHG bid adjustment” by multiplying the quantity of GHG obligation times the cost of GHG (i.e. the emission price times the emission factor) which will be added by the CAISO to the bids submitted by G3. Using the CAISO example along with an illustrative 25% “flow in to California”, the table below shows the calculations for the cost of GHG and the final bids used by the optimization.

**Flow based GHG bid adjustment for G1 and G2 based CAISO’s example 1**

<b>Generator</b>	<b>Bid (\$/MWh)</b>	<b>Emission Factor (tons/MWh)</b>	<b>Emission Price (\$/ton)</b>	<b>Flow to CA</b>	<b>GHG bid Adjustment (\$/MWh)</b>	<b>Final bid used in the optimization (\$/MWh)</b>
G2	\$35	0	\$16	25%	$0 * 16 * 25\% = \$0$	$\$35 + \$0 = \$35$
G3	\$30	1	\$16	25%	$1 * 16 * 25\% = \$4$	$\$30 + \$4 = \$34$

Under this approach G2 and G3 submit bids which do not include the cost of GHG of \$35 and \$30/MWh. Based on the powerflow model, the CAISO adjusts the bids to reflect each unit’s relevant GHG cost based on the modeled flows to California. In this example the CAISO makes no adjustment to the bid of G2 (it produces no GHG), and includes a “GHG

<sup>4</sup> Page 54 of the CAISO’s Energy Imbalance Market Revised Straw Proposal dated May 30, 2013.

<sup>5</sup> The powerflow models the electrical flow on all transmission lines based on the generator’s location, the physical characteristics of the transmission system and the distribution of load. The determination of how much flow from each EIM generator enters California should be based on the powerflow modeled in the optimization. This approach requires additional discussion on just how dynamic (e.g. determined every 5-minutes) or static (e.g. determined based on results from the DA market run) the flow determination for each unit should be.

bid adjustment of \$4 to G3”. Thus, the ultimate bids used for all aspects of the EIM optimization would be \$35/MWh for G2 and \$34/MWh for G3<sup>6</sup>.

While SCE sees many benefits to the CAISO proposal, as noted previously some portions of the approach give us concern. In fact, a side-by-side comparison may help prove the benefits of the CAISO’s proposal and address concerns. We strongly encourage the CAISO to formulate a “flow based” approach and present it to stakeholders, and allow parties to explore the full implications of both approaches before deciding on a methodology.

### **3. The EIM Proposal appears to be incompatible with convergence bidding**

The structure between the day-ahead market (CAISO only) and the real-time market (CAISO & EIM Entities) are fundamentally different. We fail to see how convergence bidding can be funded without uplift which will create unjustified convergence bid costs that are assigned to load. This impacts both the intertie nodes and internal CAISO nodes thus this remains a problem even if the CAISO leaves Convergence Bids on the ties turned off.

Anytime the CAISO changes the market model between day-ahead (DA) and real-time (RT), uplift may be created by convergence bid transactions. If a convergence bid transaction only makes money when the CAISO changes the market model between the DA and RT market, convergence bidders are “betting against the CAISO”. They are not taking a financial position against another Market Participant, but rather directly against the grid operator itself, and thus the transaction has no “willing counterparty” and the transaction will likely not “self-fund.”<sup>7</sup> We note the CAISO currently takes “any and all bets” for internal nodes, even if they create uplift. And each and every time the CAISO loses the “bet” it compels load – even if load wanted nothing to do with the bet – to pay the bidder in full on the CAISO’s behalf. This is inherently unjust and unreasonable and inconsistent with the functioning of a true market. We view it highly likely ‘bets against the CAISO’ will occur because in the EIM Proposal, the structure of the RT market is different compared to the DA market.

The problem with current EIM proposal is a fundamental difference between the CAISO DA market which excludes EIM Entities and the RT market which includes them. This

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<sup>6</sup> To the extent units avoid a GHG obligation by being “DECed”, this bid adjustment should be included in the DEC bids. To the extent a unit will not avoid GHG obligations from being DECed (e.g. the unit is DECed below an Adjusted Base Schedule that carried with it no GHG obligation) the original bid should not be adjusted for GHG.

<sup>7</sup> See SCE comments in in Docket ER10-1360. March 8, 2013, Revision of Real-Time Scheduling Transmission Constraint Relaxation Parameter.

problem will occur both with the inertia convergence bids and internal nodes impacted by EIM optimization. In addition, the allocation of convergence bid costs needs to be discussed as EIM will impact cost on internal nodes as well as the inerties.

Finally, convergence bidding likely cannot converge prices given that the CAISO proposes to model only the CAISO market in DA but both CAISO & EIM Entities in RT. With the DA and RT markets being fundamentally different and if there is money to be made, then this is a recipe for uplifts to load, which is unjustified as load is not a willing counterparty.

In SCE's opinion, the only options available to the CAISO are:

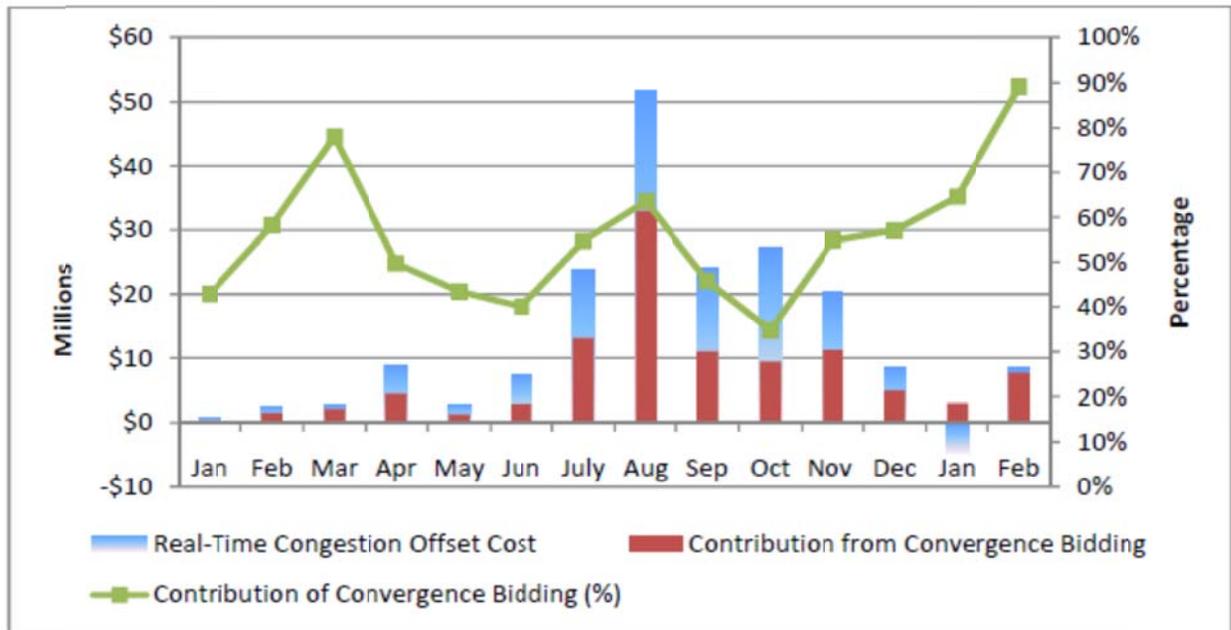
- (a) EIM Entity participation but no Convergence Bidding.
- (b) Convergence Bidding but no EIM Entity.
- (c) Allocation of uplifts from all Convergence Bids back to Convergence Bidders so that they have no incentive to make "bets against the ISO".
- (d) Modeling the EIM Entity in the DA market.

This is a fundamental issue that must be resolved. The convergence costs created can quickly off-set any savings attributed to dispatch improvements. In perspective, the convergence bids attributable to "bets against the ISO" in 2011-12 amounted to \$95 million which exceeds the estimated mid-point benefits of \$70 million.<sup>8</sup>

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<sup>8</sup> Mid point of the medium case from the EIM PacifiCorp Benefits Study, April 2013. See footnote 7 for source of \$95 million in bets against the ISO.

#### 4. Investigation of situations that create uplifts needs careful review



CAISO market uplifts have been unreasonably high as shown by Mark Rothleder’s testimony in the CAISO’s filing on revision of the Real Time transmission constraint relaxation parameter in ER10-1360<sup>9</sup>. Real Time Congestion Offset (RTCO) uplift costs in the 12 month period from March 2012 through February 2013 were approximately \$179 million.

About \$95 million of this cost was due to Convergence Bids, which equates to approximately 53% of the total uplift. The \$179 million uplift is paid for by load and SCE strongly recommends that the CAISO address these uplifts now before such uplift becomes an unnecessary burden on PacificCorp load as well once the EIM is implemented.

Notably, the Federal Energy Regulatory Commission (Commission) stated in its Order<sup>10</sup> that: “The Commission encourages CAISO to pursue its evaluation **vigorously** [emphasis added] and to propose solutions to the observed difficulties promptly when they become evident.”

<sup>9</sup> <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13203097> – Page 26, figure 3, Mark Rothleder’s testimony in Docket ER10-1360. March 8, 2013, *Revision of Real-Time Scheduling Transmission Constraint Relaxation Parameter*.

<sup>10</sup> <http://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13255895> – Paragraph 28 in Docket ER10-1360. May 9, 2013, *Order on Tariff Revisions*.

While the Department of Market Monitoring (DMM) has provided a proposal<sup>11</sup> toward a first step in addressing the Commission's directive, SCE is yet to see any evidence of the CAISO committing its efforts toward implementing this solution. SCE strongly urges the CAISO to immediately initiate a stakeholder process to address such costs and begin by determining the viability of the DMM's proposal and resolve this before it impacts EIM Entities.

#### **5. The role of Resource Adequacy for EIM Entities requires more discussion**

California has a Resource Adequacy process, outside the CAISO market, to ensure that sufficient resources are available to meet peak demand and flexibility needs. CAISO confirmed at the workshop that the EIM process can commit (start-up) a unit in California to meet requirements in the EIM entity, but not vice versa. This creates a situation where an EIM Entity could lean on the CAISO resources to meet reliability needs for peak events or flexibility requirements.

SCE has questions concerning resource adequacy as illustrated in the following example: Load is continuing to increase, yet all the economic bid resources available in the CAISO and EIM Entity have been fully committed and the CAISO has no more bids. How does it serve the increasing load?

- Are CAISO reserves (spin, non-spin) dispatched to meet EIM Entities needs?
- Would flows from the CAISO to the EIM Entity be curtailed?
- Does CAISO request the EIM Entity to dispatch any non EIM participating generation to meet load?
- Would the CAISO instruct the EIM entity to dispatch its reserves?

More generally, concerning the flow from the CAISO to the EIM Entity:

- Who carries the reserves associated with the flow between the ISO and EIM Entities?
- Does the CAISO view this as an export schedule or as native load?

The need for reliability standards and operations of the EIM needs careful review. It may be necessary as pre-condition for EIM Entity participation to demonstrate and maintain

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<sup>11</sup> [http://www.caiso.com/Documents/DiscussionPaper-Real-timeRevenueImbalance\\_CaliforniaISO\\_Markets.pdf](http://www.caiso.com/Documents/DiscussionPaper-Real-timeRevenueImbalance_CaliforniaISO_Markets.pdf)

resource adequacy. The issue becomes even more complicated if resource adequacy must include ‘flexibility’. This topic needs more stakeholder discussion.

**6. Transmission pricing is needed to align incentives between dayahead and EIM participation**

As an interim implementation of the EIM market, SCE can support the CAISO’s proposal not to charge for transmission as the flows between PacifiCorp and CAISO may be limited, but this situation must be addressed in the near term. Should additional balancing authorities join the EIM or flows become significant, this practice should not continue as it creates a disincentive to schedule load day ahead (which includes transmission costs) compared to getting transmission for free in the EIM.

The process to develop the methodology for transmission charges and wheeling charge in the CAISO took many years. The resulting methodology created a single transmission rate for the CAISO, but it also resulted in a transfer of costs between the CAISO’s participating Transmission Owners (PTOs). Some of the transmission pricing proposals set forth in the Proposal raise issues of transmission cost shifting, and would have to be considered carefully by all CAISO market participants and PTOs. SCE does not support changing the methodology for calculating the CAISO’s Transmission Access Charge. In no case, should a solution involve a cost shift between CAISO load entities and EIM Entities.

Thus, SCE recommends the following additional principal be added to the list on Page 50 of the Proposal: “No cost shifting of transmission costs between the CAISO and EIM Entities.”

Due to the tight time schedule, SCE is not ready to offer a transmission pricing proposal for stakeholder review. We request the CAISO establish a process and schedule to resolve this issue.

**7. More detail on the modeling and operation of interfaces between the ISO and the EIM entity is needed.**

The examples provided in the Proposal treat the EIM transaction as if it was a scheduled import into CAISO between balancing authorities under today’s market structure. In today’s market structure, specific external resources are excluded in the market model. In contrast, under combined EIM, an import to the CAISO needs to be modeled together with its source,

i.e., a specific resource(s) that is external to CAISO and where the import originates may need to be modeled explicitly. Similarly, load external to the CAISO is excluded from today's market and the output from an internal generator is modeled to serve the CAISO load in its entirety. In contrast, under EIM, it can't be assumed that the output of a CAISO generator will serve only CAISO load.

Due to these potential changes in how resources are modeled, to determine LMPs, shift factors are required to describe how much of the output from a resource will serve the CAISO load vs. how much will serve EIM entities' load. Please include the shift factors for the examples showing the LMP determination and provide the solution to this example.

Does the EIM Proposal change the way LMPs are determined in the CAISO? Does this result require the CAISO to treat the EIM entity as a neighboring balancing authority that only transacts based on "contract path" schedules rather than as an integrated flow-based market?

**8. More detail is needed on the Minimum Shift Optimization regarding the intertie assumptions**

Please provide more detail of the intertie adjustments that can or cannot be performed under the minimum shift optimization (MSO).