

Southern California Edison
Stakeholder Comments

Energy Imbalance Market
3rd Revised Straw Proposal
issued August 13, 2013

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The following are Southern California Edison’s (SCE) comments on the California Independent System Operator’s (CAISO) Third Revised Design Straw Proposal and Issue Paper (Proposal) for an Energy Imbalance Market (EIM) issued on August 13, 2013.¹ SCE continues to support the development of an EIM. 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. The CAISO should be commended in their effort to resolve numerous issues and present solutions in revised proposals. However, while progress has been made, there are remaining issues and questions that need to be resolved before the Proposal can be finalized per the schedule on September 23, 2013.

SCE comments on the following issues:

- The CAISO should develop a phased EIM implementation plan allowing the CAISO more time to resolve, design, and test the numerous outstanding complex issues.
- Convergence bidding has many complexities that need resolution before finalizing an EIM proposal.
 - SCE remains concerned that Convergence Bidding will not function properly in the proposed EIM design.

¹ http://www.aiso.com/Documents/ThirdRevisedStrawProposal-EnergyImbalanceMarket-Aug13_2013.pdf
In addition, the CAISO held a meeting on August 20, to review the proposal with the following presentation:
<http://www.aiso.com/Documents/Presentation-ThirdRevisedStrawProposal-GovernanceEIM.pdf>

- SCE requests the Market Surveillance Committee issue an opinion on whether Convergence Bidding can function as originally designed in light of the proposed EIM.
- The Department of Market Monitoring (DMM) proposal for Convergence Bidding uplift allocation looks promising and should be fully developed.
- The CAISO should implement the DMM's Convergence Bidding uplift proposal expeditiously within the current CAISO market.
- An EIM that conforms to the California Air Resources Board's regulation on Greenhouse Gas Emissions (GHG) has multiple complex issues that impact the design and operation of an efficient EIM.
 - The CAISO must fully explain how price formation will occur in the EIM given the complexities caused having two prices one with and without GHG.
 - SCE recommends that bidding for GHG should be linked to compliance costs and thus subject to a bid cap and bidding limitations.
 - The CAISO should offer more detail on the treatment of GHG in the EIM.
 - Discrepancy in the treatment of GHG between the day-ahead (DA) and real-time (RT) markets creates incentive differences for generators.
 - Lack of a provision to allow entities to utilize the CARB's Qualified Export (QE) Adjustment. creates market (GHG and electricity) inefficiencies
 - The CAISO should consider making EIM Export Allocation Payments subject to refund given the regulatory uncertainty associated with GHG compliance for EIM Entities
- SCE seeks further information on the flexibility capacity constraint and how it would function with a generation balancing authority with only variable energy resource generation.
- SCE seeks clarification on Bid Cost Recovery and Neutrality Settlement
- The CAISO should explain if existing provisions to curtail exports already prevent excessive resource leaning.

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

1. While SCE continues to support an EIM, the CAISO should develop a phased EIM implementation plan to allow more time to resolve numerous complex issues

SCE continues to support the development of an integrated EIM with PacifiCorp. While much progress has occurred, there are still numerous complex issues that need resolution. A phased process would allow benefits to be obtained while offering more time resolve these issues needed to implement an integrated EIM. SCE recommends that Phase 1 be a separate EIM (with full 15-minute and 5-minute LMP markets) established for PacifiCorp under the current CAISO schedule.^{2 3} This design phase should ensure robust 15-minute scheduling exists between the CAISO and the EIM. This would allow the CAISO and PacifiCorp to ensure their systems are working as intended and any problems would not impact the current CAISO market. Phase 2 would be the joint optimization of resources (15-minute and 5-minute) located in CAISO and PacifiCorp. While Phase 1 is operating, there would be additional time to resolve the numerous EIM design complications and run simulations of joint optimization to ensure the processes are working as intended. There are two reasons that a phased approach has advantages.

First, a separate EIM for PacifiCorp does not require the resolution, design and testing of the following issues:

- GHG compliance issues (given that imports of GHG will be treated as they are today using E-tags)
- Including a separate GHG component in the locational marginal price (LMP) for imports into California
- Transmission pricing
- Flexible Ramping Constraint requirement & sufficiency tests (resource leaning)
- EIM Entity Unit Commitment
- Uplift cost allocation & revenue neutrality
- Convergence bidding

² Phase 1 would be optimization of PacifiCorp resources at the 15 and 5 minute intervals. Using the results of the 15 minute CAISO and PacifiCorp market, smart 15 minute schedules between the two areas would be created. The 15 minute intertie schedule would not be updated at the 5 minute interval.

³ In comments to the second revised Proposal, both PowerEx and Pacific Gas and Electric (PG&E) recommended a phased in approach to EIM.

Second, according to CAISO studies, it would provide dispatch benefits of \$2.3-\$23 million per year to PacifiCorp and is possible under the current schedule.⁴ Moreover, this approach allows for 15-minute interchange scheduling at the interface between the CAISO and the EIM entity, expected under FERC Order 764 market changes, which should capture the bulk of any remaining benefits.

SCE believes the current scope of the full EIM proposal is likely to face delays due the aforementioned unresolved issues and necessary CAISO system changes. Having the capability to implement Phase 1 greatly increases the likelihood of an EIM implementation in October 2014.

In terms of schedule and process, we recommend the CAISO first seek CAISO Board approval of the implementation of Phase 1 with the current target of an October 2014 go live for PacifiCorp's EIM. At the same time, the CAISO could present, for information purposes, the current conceptual design for Phase 2. The Board would also approve the continuation of moving forward with Phase 2 design, system changes, and testing, but stop short of approving full implementation. Once there is resolution on Phase 2 issues and designs have been tested, based on these results, the CAISO would return to the Board, request any modifications as needed, and then gain final approval of the Phase 2 issues.

Finally, in addition to the issues listed above, there are still many unanswered questions that need resolution before the establishment of a final CAISO+PacifiCorp EIM proposal, currently scheduled for September 23, 2013. For example, the CAISO scheduled an EIM technical workshop on September 3, three days prior to comments due date. The CAISO has also alluded, in their response matrix, to having additional technical workshops.⁵ These actions make it clear there are still many issues that need understanding by stakeholders and issues resolved before the establishment of a final proposal.

Furthermore, some of aforementioned issues would require changes in the CAISO model and rely on the progress of the Full Network Model Expansion initiative. The Phased approach would allow the CAISO, and market participants, more time to make changes to their model and software systems.

⁴ Per the CAISO EIM benefits study, the benefits to PacifiCorp of intraregional dispatch ranged from \$2.3 - \$23 million per year. EIM PacifiCorp Benefits Study, CAISO April 1, 2013, presentation, slide 11.

⁵ http://www.caiso.com/Documents/EIM_SecondRevisedStrawProposalStakeholderCommentsMatrix.pdf pages 2, 12, 25, 33, and 51.

Due to complexities such as GHG pricing and lack of a day-ahead market for EIM Entities, the CAISO's EIM proposal is not a simple extension of the current market design. Rather, the EIM proposal changes the very economic meaning of an LMP in areas external to the CAISO, and will have new material impacts on convergence bids settlements. These design proposals need to be well understood and simulated to understand their impacts. In a rush to meet the current schedule, there is a risk of creating a poor design that may result in a failure to deliver the intended benefits of a wider EIM and instead result in detrimental consequences. We note the EIM has the potential to extend throughout large portions of the WECC – the CAISO and market participants require thorough testing and simulation to ensure we “get this right”.

In summary, given the complexity of the EIM coupled with the potential wide reaching impacts of the market, a phased approach is rational and prudent. The phased approach can still deliver material economic benefits and should increase the likelihood of an October 2014 go-live. The phased approach allows more time to resolve complex issues, which SCE details in the following sections. It also allows time to test the design to ensure the fully co-optimized market CAISO+EIM delivers value to all stakeholders.

2. Convergence bidding has many complexities that need resolution before finalizing an EIM proposal

A primary reason for convergence bidding was to resolve the problem of participants either under-scheduling or over-scheduling in the day-ahead market and in turn creating price differences between the day-ahead and real-time market. By enabling virtual load and supply bids, prices could converge improving market efficiency. The Proposal establishes a real-time market of CAISO+EIM while the day-ahead load remains only CAISO, making the day-ahead and real-time markets fundamentally different. As explained in more detail below, SCE questions whether convergence bidding can converge prices as intended between two fundamentally different markets. As a result, SCE requests the Market Surveillance Committee investigate and issue an opinion on the ability of convergence bidding to operate as intended under proposed EIM structure.

In response to concerns of uplift created by convergence bidding, the Proposal outlines a solution that would assign some of the convergence bidding uplift costs back to virtual bidders when it is associated with constraints that become infeasible in the EIM footprint.

SCE supports further investigation of the solution to resolve the assignment of uplift costs, and recommends CAISO apply a workable solution CAISO wide.

a. SCE remains concerned that convergence bidding will not function properly in the proposed EIM design

The Department of Market Monitoring (DMM) uplift allocation proposal addresses an important, but narrow issue, related to the cost allocation when DA schedules create infeasibilities in the 15-minute EIM footprint. However, the much larger and general issue is the structural difference between day-ahead market (CAISO only) and the real-time market (CAISO & EIM Entities) remains unaddressed. SCE does not support simply addressing “part of the problem” while ignoring the more general issues.

SCE has noted this concern in every round of comments and the CAISO has not yet provided any reason to conclude these concerns are unwarranted or have been addressed. A host of modeling and behavioral actions related to nodes within the EIM can impact prices within the current CAISO footprint. These include EIM Base Schedules, EIM load forecasts and the distribution of the load (LDFs) within the EIM, EIM transmission outages, EIM transmission constraints, and modeling of unscheduled flow within the EIM, to name a few. Changes in any of these assumptions between the day-ahead market and the 15-minute real-time market will impact prices, not only in the EIM, but also likely within the CAISO footprint. Once again, these model changes will provide virtual bidders the opportunity to “bet against the CAISO” and when they win, the market will not ‘self-fund’ and require uplift. SCE does not find this outcome reasonable.

Moreover, impacts on CAISO prices may be predictable by EIM Participants. For example, an EIM Participant may learn it can impact prices on particular CAISO nodes depending on whether or not it includes a generator in its Base Schedule. In this situation, it could potentially profit by placing Virtual Supply or Virtual Demand bids on impacted CAISO nodes in light of its private knowledge of its Base Schedule strategy.

In sum, SCE contends that convergence bids only converge prices and do so without resulting in uplift requires 1) a ‘closed system’ in which the market operator maintains constant limits between the day-ahead and real-time market topology, and,

2) where physical and virtual market participants take ‘bets’ against each other’s actions anywhere bids are allowed within that market. Neither of these conditions is true in the EIM proposal. That is, the CAISO will systematically change the market between day-ahead and real-time, and rules only allow virtual transactions in a subset of the ultimate real-time market footprint. As a result, SCE questions if Convergence Bids can properly converge prices in the proposed EIM design. Additionally, it seems highly likely that ‘bets against the CAISO’ (and possibly against EIM entities) will force load to pay unjust and unreasonable uplift costs. Finally, SCE notes the proposal would require only CAISO load to pay this uplift while resources within PacifiCorp have the ability to impact and profit from convergence bidding settlements—SCE does not find this result reasonable.

b. SCE requests the Market Surveillance Committee issue an opinion on whether Convergence Bidding can function as originally designed in light of the proposed EIM market

Given the complicated nature of this problem, and in light of the material uplift issues already experienced with Convergence Bidding, SCE formally requests the Market Surveillance Committee explore this design and issue an opinion on if Convergence bids can function properly, and without uplift, in the proposed EIM design.

c. The Department of Market Monitoring (DMM) proposal for Convergence Bidding uplift allocation looks promising and should be fully developed

In the current Proposal, the CAISO offers a new uplift allocation method for Convergence Bids. SCE appreciates the CAISO moving away from the approach in the Second Proposal as it created additional pricing issues. The new proposal recognizes that the CAISO will model EIM Entity transmission in the day-ahead market, but will not enforce transmission limits. However, in the 15-minute and 5-minute markets, the CAISO will enforce the transmission limits. As a result, the CAISO may clear bids in the day-ahead market that ultimately create infeasible flows in the 15-minute and 5-minute markets when the market enforces the EIM constraints.

Under the revised proposal, the CAISO will take note of any flows cleared in the day-ahead market (both Virtual and Physical flows) that ultimately exceed the path levels enforced in the 15-minute EIM market. When the day-ahead flow exceeds the 15-minute limit, the CAISO has, in effect, an infeasible flow. In general, restoring an infeasible flow to feasible limits creates uplift. The CAISO proposes to allocate the uplift associated with returning the line to feasible limits to the virtual and/or physical flow that created the infeasibility.

SCE supports the CAISO developing the DMM proposal in full. While limited examples have been provided, SCE encourages the CAISO to simulate “real world” cases using the full network EIM model and representative bids to ensure the proposal produces reasonable results. The testing and results should be shared with stakeholders to allow a final evaluation.

d. The CAISO should implement the DMM’s Convergence Bidding uplift proposal expeditiously within the current CAISO market

Assuming the aforementioned testing indicates reasonable performance, the CAISO should implement Convergence Bidding Uplift proposal in the current market. As noted, the CAISO currently allows Convergence Bidders to profit from modeling changes between the CAISO day-ahead and real-time market. This current situation in today’s CAISO operations directly compares to the problem identified in the EIM, and the same solution should work in both cases.

SCE raised the material concern of “betting against the CAISO” in comments on docket ER13-1060⁶. The Federal Energy Regulatory Commission (Commission) acknowledged this concern in their Order and noted “**The Commission encourages CAISO to pursue its evaluation [of proper uplift allocation] vigorously and to propose solutions to the observed difficulties promptly when they become evident.**”⁷ (Emphasis added) If the proposal proves viable, the CAISO should promptly file with the Commission for implementation in the current market.

⁶[http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/882579AD007FBDA988257B3D0067DC4B/\\$FILE/130329+ER13-1060+SCE+Motion+to+Intervene+and+Comments+on+Proposed+CAISO+Tariff.pdf](http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/882579AD007FBDA988257B3D0067DC4B/$FILE/130329+ER13-1060+SCE+Motion+to+Intervene+and+Comments+on+Proposed+CAISO+Tariff.pdf) Page 14-16.

⁷<http://www.ferc.gov/EventCalendar/Files/20130509152959-ER13-1060-000.pdf> page 11, paragraph 28.

3. The California Air Resources Board's regulation on Greenhouse Gas Emissions (GHG) creates multiple issues that impact the design and operation of an efficient EIM

Given that GHG is a compliance cost for transactions involving California, but not PacifiCorp, GHG policy has created multiple complications which impact market incentives. The Proposal effectively creates two prices at nodes in EIM BAAs dependent on where the power is deemed delivered. The price formation of this two-LMP system has yet to be fully explained and vetted, nor are we aware of any electricity market in North America that has an analogous pricing algorithm that can provide insight on price formation. Additionally, the Proposal's treatment of GHG creates asymmetric incentives for participation in the day-ahead market and real-time market. Finally, only EIM Participants are allowed to submit separate GHG bid component in addition to the energy bid. These significant deviations from existing market practices are untested and require careful analysis to ensure they do not distort the markets (either the CAISO's or the EIM Entities') in unintended ways.

a. The CAISO must fully explain how price formation will occur in the EIM given the complexities caused by pricing GHG

The CAISO has offered a completely new system for price formation with the introduction of two LMPs for every node in the EIM Entity. The CAISO has not fully explained this complex new system for price formation. SCE is concerned that new system for LMP formation has not been fully designed nor vetted, which could result in inappropriate pricing and market disruption.

While SCE appreciates the CAISO's provided theoretical layout of LMP with equations on Page 79-81 of the Proposal, these concepts are not carried into its examples. For instance, the formulas show that the transmission line flow and locational market prices (LMP) are determined with the use of shift factors representing the percentage of generator power flow to remain in the CAISO or the EIM Entity. However, the numerical examples do not include shift factors in the determination of the LMPs or the amount of line flow between L1 and L2. SCE has been unsuccessful in attempts to replicate the examples with a model representing the formulas. Part of the problem is due to the shift factors that represent physical flow. To obtain the results in the examples, the shift factors would have to unrealistically change between examples. If the shift factors are held constant, then different LMP

results occur due to line and shift factor constraints. To summarize, the examples provided do not follow the LMP theory provided in the formulas.

There is also a lack of clarity in the formulation of the allocated exports, as the formula for the E_j (EIM energy export allocated to EIM Entity generator j) is not defined.⁸ As a result, it is unclear exactly how the Proposal manages to combine in the dispatch an LMP (using shift factors) and a deemed export allocation for GHG compliance. This is also important as the allocated exports appear in the simplified objective function proposed by the CAISO, and yet how the allocated exports are calculated and its relationship to other elements (e.g. the bids, the clearing prices) is not clear from the Proposal.

SCE recommends the CAISO publish complete examples (with the shift factors) of the Security Constrained Economic Dispatch (SCED) with GHG Emission Costs and then host a technical conference to review with stakeholders. Until there is more clarity on the details of the SCED, SCE cannot fully endorse the SCED proposal.

Finally, a second bidding component, to capture GHG costs, has been added to the formation of the LMP. In SCE's view, the intent of the GHG component should be to compensate a generator for a cost that only occurs if a non-clean resource exports to California. SCE fails to see any economic rationale to allow a resource with no GHG obligation to establish the price for a component that is intended to recover GHG compliance costs. In addition, the proposal effectively creates two components subject to market bidding because there are no restrictions on this bid, except that the combination of the energy bid and GHG bid cannot exceed \$1000/MWh. This has the ability for behaviors that were not intended. For example, what happens if a unit bidding a negative GHG price is marginal?

b. SCE recommends that bidding for GHG should be linked to compliance costs and thus subject to a bid cap and bidding limitations

The original Proposal used the emission factor (metric tons/MWh) for a resource and a GHG index gas price (\$/ metric ton) to determine the GHG cost of a GHG-emitting resource exporting to California. In the Third Proposal, EIM Participating Resources are able to submit their GHG compliance bid prices in \$/MWh. SCE

⁸ Proposal, pages 80-81.

assumes the reason for the change is because some parties commented that individual participants may have different costs for GHG compared to an index price. If the market is competitive and price formation works correctly and drives parties to submit bids reflective of their costs, then this is a reasonable proposal. It would be a false assumption to assume all parties would only bid their actual GHG compliance costs in the GHG bid. However, as aforementioned above, the CAISO has not demonstrated that its newly proposed system for LMP formation with GHG bids will work correctly. As the GHG price component was added to allow for the recovery of a cost when an export occurs to California, SCE recommends that GHG be considered a cost recovery element subject to bidding limitations.

The GHG component can be viewed similar to a cost recovery component, such as start-up costs, as it sets the export allocation payment⁹ which is intended to compensate resource for GHG compliance cost when exporting to California. In order to allow entities to have some flexibility to submit values reflective of their individual GHG costs, while at the same time minimizing the potential for entities to take advantage of potentially inappropriate price formation, SCE recommends the following bidding limitations:¹⁰

- Resources submit a \$/metric ton bid subject to a bid range between zero and 150% of the GHG index price
- Limit the GHG bid to one value (\$/metric ton) per day per resource
- Only allow GHG-emitting resources to bid GHG costs¹¹

Moreover, SCE does not support using a GHG bid component to represent a “willingness to sell to California”. Eligible EIM bids participate in the price formation of the GHG shadow (i.e. the “GHG clearing price”) paid to all units deemed to import to California. We find no economic justification to increase the GHG shadow price simply because a unit prefers not to sell to California. If EIM Participants want such a feature, it should be handled outside of the GHG pricing mechanism.

⁹ The Export Allocation Payment contains the shadow price that covers the marginal GHG cost.

¹⁰ These recommendations would also limit any gaming opportunities that might be exploited. For example, if a resource bid zero GHG to be committed, and then later increased their GHG bid in order to receive bid cost recovery.

¹¹ This would also include non-emitting resources if they were required to comply with CARB reporting requirements as “unspecified” resources.

SCE's proposed limits on bids will balance flexibility for a generator to recover legitimate costs and limit the financial impact of any possible exploitation of the new LMP pricing algorithm. The limit of one value per day is reasonable given that GHG costs should not vary within a day. The limitation of GHG bidding to only GHG-emitting units is reasonable because there is no justification for allowing non-emitting units—for example hydro units—to set the GHG price that all EIM Participants, deemed to export to California, get paid when they do not incur GHG costs.¹²

In summary, SCE's proposal for GHG cost bidding is a balance between allowing resources the flexibility to recover their cost while limiting potential distortions caused by the new price formation methodology.

c. The CAISO should offer more detail on the treatment of GHG in the EIM

SCE appreciates that the CAISO has responded to some of SCE's questions in its stakeholder meetings and written responses to comments, but CAISO has not addressed a number of substantial concerns. In the last round of comments SCE asked a number of questions related to the settlement of deviations when the export allocation changes. In its written responses, the CAISO responded with a brief answer that does not offer the necessary detail to understand the new complicated price formation. In a subsequent workshop and design proposal, the CAISO should address the following questions, which SCE has offered previously:

- i. How are deviations settled when the export allocation changes within the 5 minute market? For example, an EIM Participating Resource, "Generator Y," has instructions for a 5 minute dispatch that will result in an export allocation of 10 MWh, which equates to 4 tonnes of GHG at Generator Y's 0.4 tonne/MWh emissions factor. Generator Y fails to perform and produces 0 MW so the EIM Entity ramps up "Generator Z," a non-participating EIM Entity resource, to provide 10 MWh. Generator Z is a coal unit with an emissions factor of 0.8 tonnes / MWh so 8 tonnes of emissions are created—4 tonnes more than would have been created if Generator Y had not deviated. Given that there is no intra-5 minute market, Generator Y will "pay back" the 5 minute LMP for deviating, while Generator Z will receive the 5 minute LMP.

¹² This situation could occur during spring run-off when hydroelectric resources are on the margin.

- ii. The export allocation had been assigned to Generator Y in the 5 minute market, but given that Generator Y did not perform—does it still have an export allocation?
- iii. If not, then who has responsibility for that export allocation and how are they compensated for it?
- iv. Generator Z is not an EIM Participating Resource and thus does not receive an export allocation nor subsequent CARB compliance obligation. Does that export allocation and CARB obligation fall to PacifiCorp?
- v. What price will Generator Y “pay back”? Note that it may have received an export allocation payment on top of the energy (LMP) payment.
- vi. What if Generator Y was scheduled to deliver 20 MWh total, half to CAISO and half to PacifiCorp, but instead delivers only 10 MWh. Are the allocations prorated or sequential?
- vii. Please provide detailed examples on how deviations are settled.

d. Discrepancy in the treatment of GHG between the day-ahead (DA) and real-time (RT) markets creates incentive differences for generators

Non-California resources participating in the DA market have the ability to sell “unspecified power” which may enter California with GHG compliance obligation determined by the unspecified emissions rate. In contrast, the Proposal’s real-time market will use the unit specific emission factor for determining the GHG compliance obligation for resources’ power that enters California. Thus, resources with emission rates higher than the unspecified emission factor will prefer to sell day-ahead instead of real-time so they can take advantage of the lower emission rate, therefore incur lower costs. This creates asymmetric incentives between day-ahead and real-time markets, which would also impact resource bidding strategy. CAISO should investigate the implications of this asymmetric incentive to participate in one market rather than the other.

e. **Lack of a provision to allow entities to utilize the CARB’s Qualified Export (QE) Adjustment**

CAISO should allow entities to utilize the CARB’s QE Adjustment¹³ to appropriately reduce their GHG compliance obligation for non-tagged wheels of electricity.¹⁴ Given the existing market design, entities can reduce their GHG compliance obligation with the CARB if they show that they imported into California and exported from California within the same hour, even if that import and export is not tagged as a wheel through California. This is possible by showing CARB the E-tags for the entity’s imports as well as the e-tags for the entity’s exports in any given hour. Under the EIM Proposal, however, the CAISO will not provide entities E-tags for their exports to the EIM BAAs. Thus, entities will not be able to use the QE Adjustment to reduce their compliance obligation with the CARB, resulting in higher compliance costs for those entities and for California as a whole.¹⁵

While the volume of exports from CAISO to PacifiCorp may not be substantial, the volume of exports from CAISO to other parts of the WECC is considerable. The lack of consideration of the CARB’s QE Adjustment in the EIM design is an issue that may seem relatively small at this point if only PacifiCorp joins the EIM, but the issue will become exacerbated if and when other WECC balancing authorities join the EIM. The CAISO should design the EIM so that it will not have to later re-design its market to resolve outstanding issues such as the QE Adjustment.

¹³ See the ARB’s Cap-and-Trade Regulation for details on the QE Adjustment: Section 95111(b)(5), “California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms,” at 81, http://www.arb.ca.gov/cc/capandtrade/september_2012_regulation.pdf.

¹⁴ “non-tagged wheels of electricity,” as referred to here, are simultaneous imports into California and exports from California by the same entity in the same hour that are not e-tagged as wheels because they are from different transaction points and thus are on different e-tags. In non-tagged wheels of electricity entities are not consuming electricity in California so while the transactions are not tagged as wheels, together they essentially serve the same purpose as a wheel. For example, “MarketerX” tags electricity from Four Corners to SP-15 in the same hour it tags an export from NP-15 to NOB.

¹⁵ Prices for California as a whole will increase given the increased GHG compliance obligation caused by the EIM will increase the demand for GHG compliance instruments, thus raising the price of compliance instruments.

f. The CAISO should consider making EIM Export Allocation Payments subject to refund given the regulatory uncertainty associated with GHG compliance for EIM Entities

CAISO has created its EIM proposal to account for GHG costs under the premise that EIM Entity Participating Resources will be California Air Resources Board (CARB) jurisdictional entities and as such will be required to comply with California's Cap-and-Trade Program. It is not entirely clear, however, if all EIM Participating Resources will ultimately be CARB jurisdictional entities.¹⁶ If EIM Participating Resources are not CARB jurisdictional entities then the EIM Participating Resources will not be required to comply with the Cap-and-Trade Program as assumed in the EIM design. Thus, if Participating Resources are determined to not be CARB jurisdictional entities after they have been compensated for GHG costs according to the EIM design, then the Participating Resources could be left with windfall profits from unjust and unreasonable payments intended to recover GHG cost. Accordingly, SCE recommends the CAISO consider making all Export Allocation Payments¹⁷ subject to FERC Refund until it is certain that EIM Participating Resources will incur GHG costs for California's Cap-and-Trade Program. This is reasonable as the purpose of the export allocation payment would have not been needed.

4. SCE seeks further information on the flexibility capacity constraint and how it would function with a generation balancing authority with only variable energy resource generation (VERs)

The Proposal mentions the Flexible Capacity Sufficiency test will utilize information from the resource plan submitted by EIM Entity Scheduling Coordinator.¹⁸ However, there is no detail on what resources from the resource plan are used in calculating resources available to meet flexibility need under EIM. SCE has the following questions about resources meeting flexibility need:

¹⁶ There are outstanding concerns regarding CARB's ability to regulate out-of-state generators as first deliverers of electricity. It is reasonable to anticipate that after the deadlines for the surrender of compliance obligation (the first of which is November 1, 2014) there may be legal challenges that will determine the CARB's jurisdictional authority.

¹⁷ The Export Allocation Payment contains the shadow price that covers the marginal GHG cost.

¹⁸ Proposal, page 45-47.

- Do units online, but not bid into EIM count or not count?
- Do capacity ranges excluded from EIM dispatch count?
- Does EIM Entity regulation capacity count?
- Does demand response in the CAISO or EIM Entity count?
- Do firm contracted imports count?

On August 12, CAISO held a technical workshop to describe their flexible ramp sufficiency tests and constraints in the EIM.¹⁹ SCE has the following questions regarding the constraints in presentation:

- Clarification of the joint flexible requirement
- Source of the available transmission used in the constraint

The Proposal includes constraints for the individual balancing authorities as well as the joint combinations when diversity can be taken into account. The constraint recognizes that total requirement can be less than the individual balancing areas due to diversity of load. However, some of the constraints between two balance authorities do not appear to recognize diversity in the equations. For example, the equation:

$$FRC_0 + FRC_1 \geq \max(0, FRR_0 + FRR_1 - \text{available imports})$$

Should this instead be:

$$FRC_0 + FRC_1 \geq FRR_{0\&1} \leq \max(0, FRR^0 + FRR^1 - \text{available imports})$$

The CAISO has not explained where the value of available imports will come from in the flexible capacity constraint. Does it come from the base schedule submitted by the EIM Entity? If yes, then is this import capability actually available in the EIM optimization?

Finally, SCE has concerns if the flexibility test design will work with “generation only” balancing authorities, particularly if they consist of only variable energy resources. In this case, the resource plan will have matched forecasted generation and exports and may appear on a forecast basis to meet their flexibility need. In real-time, however, the generation will not meet schedule and instead will be buying and selling 15 and 5 minute energy to the EIM. EIM will take care of the difference between actual and forecast, and they will have exported

¹⁹ http://www.caiso.com/Documents/Agenda-Presentation-EnergyImbalanceMarketTechnicalWorkshopAug13_2013.pdf

their intermittency to external balancing authorities. Will the CAISO's proposal prevent this outcome?

SCE assumes the CAISO proposes to enforce the flexible capacity constraints in the 15-min market. The details regarding its enforcement and deployment in the 5-min market need to be explored, as well as the cost allocation of these constraints, especially the joint constraints.

5. SCE seeks clarification on Bid Cost Recovery and Neutrality Settlement

a. Bid Cost Recovery needs more equitable treatment of assignment of cost

The CAISO Bid Cost Recovery (BCR) structure is based on costs netted against revenues over a twenty-four hour horizon. In this proposal, the CAISO is proposing to separate BCR into two cost components: (1) energy and, (2) unit commitment costs. The energy cost component will be allocated based on a daily sum of the absolute value of all uninstructed imbalance energy of load and supply. Suppose a unit in EIM Entity A is committed in real-time for a span of four hours, and EIM entity B has zero deviations in those four hours, but over the trade date it has a large net deviation, the EIM Entity B will be assigned a portion of the energy bid cost recovery from EIM Entity A, this can create a mis-alignment in attributing bid cost recovery to appropriate entities

For the unit commitment cost component, the CAISO is proposing to make it optional for an EIM Entity to elect real-time unit commitment. Consider a unit in EIM Entity A that is committed in the real-time market and EIM Entity B elects not to participate in real-time unit commitment, the unit commitment costs would fall mostly on EIM Entity A even if the unit received real-time dispatches due to the requirements of EIM Entity B. More discussions are needed to consider the implications of real-time unit commitment options in the EIM market where there is a disparity in must-offer obligation requirement across the EIM footprint.

SCE requests that CASIO provide a technical workshop on Bid Cost Recovery payments to suppliers and the cost allocations in EIM market. SCE suggests that CAISO provide examples showing the difference in BCR market allocations for BAA Entities that participate in real-time unit commitment versus BAA Entities that choose not to participate in real-time unit commitment.

b. Real-Time Market BAA Neutrality Settlement

One of the major contributors to Real-Time Market Neutrality is Uninstructed Deviations. CAISO is proposing that after making BAA proportional transfer adjustments, the Real-Time Market BAA Neutrality will be allocated to CAISO and the EIM BAA Entities and the allocation of this neutrality is up to the individual EIM Entity. For example, in CAISO, this neutrality amount is allocated to Measured Demand and for PacifiCorp EIM Entity, under its current tariff (Schedule 4 and Schedule 9), this amount would be allocated equally based on tiers of load and supply deviations. What might be the implications when market participants across the EIM footprint do not share a consistent set of neutrality cost allocation rules such that generators in the PacifiCorp EIM Entity that deviate will share in the market neutrality and the generators in the CAISO who deviate will not?

c. BAA Real-Time Congestion Balancing Account

Please provide examples of how credits for Existing Transmission Contract and Transmission Ownership Right will be handled in the BAA Real-Time Congestion Balancing account for both CAISO and EIM Entity. Please confirm if both 15-min and 5-min shift factors will be used to determine marginal congestion cost contributions to the BAA Real-Time Congestion Balancing Account. Will these shift factors be posted on OASIS?

d. Flexible Ramping Constraint Cost Allocation

Each EIM Entity BAA will receive its own Flexible Ramping Constraint Costs based on the individual BAA procurement requirement. Will the CAISO be allocating the costs based on 75% Load and 25% Supply Deviations for the EIM Entity BAA as well as for the CAISO BAA?

6. The CAISO should explain if existing provisions to curtail exports already prevent excessive resource leaning.

The CAISO has Section 40.6.11 in its tariffs which allows curtailment of exports in emergency situations, which states, “At its sole discretion, the CAISO may curtail exports from Resource Adequacy Capacity to prevent or alleviate a System Emergency.” Can this

provision, or a modification to specify flexible reserves, be used to curtail transfers from the CAISO to the EIM when resources in the CAISO become scarce? If yes, this would help address SCE's concerns expressed in previous comments that the proposal may limit the ability of a balancing authority to utilize ample resources from a neighboring balancing authority.