



Comments of Pacific Gas & Electric Company *Energy Imbalance Market Revised Straw Proposal*

Submitted by	Company	Date Submitted
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Pacific Gas & Electric (PG&E) offers the following comments in the stakeholder process for the California Independent System Operator’s (CAISO) Energy Imbalance Market (EIM) Initiative’s May 30, 2013 Revised Straw Proposal (“Proposal”).

PG&E’s primary objective in the EIM stakeholder process is to recommend and support design elements that:

- Help achieve the benefits purported in the CAISO’s EIM benefit study;
- Mitigate additional market risk that may be introduced by the EIM; and
- Ensure fair treatment of both the EIM Entity and the CAISO in regards to cost allocation and market obligations.

At the same time, PG&E is continuing its assessment on whether the benefits of an EIM will outweigh the costs and risk to PG&E customers. PG&E’s support on an EIM depends on PG&E’s comfort that the EIM treats our customers fairly and is likely to have a net positive impact.

PG&E comments are detailed below and focus on the following points:

1. PG&E appreciate the new GHG framework and is assessing impacts to our systems;
2. Convergence Bidding requires explicit consideration in the EIM stakeholder process;
3. A flexible capacity requirement (with a must-offer obligation, or MOO) should be set for EIM Entities similar to the requirements for CAISO participants;
4. Flexibility requirements, for both the forward and spot market requirements, need to be assessed for the joint EIM footprint;

5. Deliverability of flexible capacity in the EIM must be considered in the procurement of flexible capacity in the EIM Entity;
6. The CAISO should have the ability to commit fast-start resources in an EIM Entity;
7. The appropriateness of the allocation method for the four uplifts needs more examination; and
8. Two alternative modifications to the Minimum Shift Optimization (MSO) approach should be considered.

The absence of comments on a particular element of the proposal should not be perceived as our endorsement. This is a sizeable and complex initiative, and PG&E has not been able to fully vet every aspect of the proposal in the time allotted in the stakeholder process. Instead, PG&E has focused on what we consider the most important issues. We may offer input on the other elements at a later date.

1. Greenhouse Gas Proposal – PG&E is Evaluating the Implications and Assessing System Changes

PG&E appreciates the new GHG proposal and examples. The proposal provides a solid framework to evaluate the interaction of the GHG requirement and the energy markets in the CAISO and EIM Entities. We are still evaluating the implications of the design and assessing the potential changes to PG&E's bidding, settlement and monitoring systems.

2. Convergence Bidding – Needs Detail and Explicit Consideration in this Process

PG&E is greatly concerned about the impact EIM will have on convergence bidding, but the proposal has been silent on this issue. We ask that the CAISO address this issue in the next proposal.

The proposed EIM will introduce significant new structural differences between the day-ahead (DA) and real-time (RT) EIM markets by creating different market footprints for these markets. For example, the two markets will differ in the following ways (there may be more):

- The transmission model used in CAISO's DA market will not model transmission systems in external EIM Entities while the transmission model used in EIM will model transmission systems in CAISO as well as external EIM Entities.¹
- CAISO's intertie scheduling points that are used to schedule imports into CAISO from the EIM Entity and exports from CAISO to the EIM Entity will exist in the DA market

¹ Some aspects of the EIM Entity transmission system may be modeled in the DA market, but it is unclear how much. PG&E assumes less detail will be modeled in the DA market compared to the RT.

model. However, these inerties either won't exist or won't have the same composition in the RT EIM model.

- New EIM inerte scheduling points will exist in RT, that didn't exist in the CAISO's DA market. These inerties are not modeled or scheduled in CAISO DA market.
- New generation and load nodes (in the EIM Entity) will be included in the RT EIM that are not modeled in the CAISO DA market. The schedules of PacifiCorp resources will be adjusted along with the schedules of CAISO resources since the systems will be co-optimized.

To the degree possible, the structural differences between the CAISO DA market and the RT EIM should be identified and their potential effects evaluated. In particular, the interaction of convergence bidding with the structural differences between markets must be investigated. Currently, convergence bidding at the inerties is suspended due to strategic bidding activity, often called gaming, which exploited persistent structural market differences between CAISO's DA market and the Hour Ahead Scheduling Process. PG&E is concerned that the proposal has not yet considered the impacts or risks that may arise from convergence bidding interacting with the new structural differences and what safeguards need to be implemented before EIM goes live.

To help mitigate the risk associated with gaming of structural market differences introduced via the EIM, PG&E recommends that the CAISO address the issue of the allocation of uplifts related to convergence bidding as recommended by the DMM.² This needs to be done before the EIM goes live.

Furthermore, PG&E recommends that convergence bidding at the inerties should not be considered until the after EIM goes live and is operational long enough to show that the structural differences do not affect market outcomes in a way that increases risks if convergence bidding at the inerties were allowed. At that point the CAISO should convene a second convergence bidding initiative to evaluate the potential risks and benefits that may arise from convergence bidding at the inerties. This is similar to the prudent approach taken by the CAISO in its Order 764 market modifications.

² See section 4.3 http://www.aiso.com/Documents/DiscussionPaper-Real-timeRevenueImbalance_CaliforniaISO_Markets.pdf

3. Set a Flexible Capacity Requirement (with an associated MOO) for EIM Entities Similar to that for CAISO Participants

Today, initiatives are underway at the CPUC and the CAISO to establish a one-year-forward flexible capacity requirement for CAISO participants.³ The goal of these initiatives is to ensure that there are adequate resources to meet the system net load ramping requirement in all hours. To ensure this requirement can be met, the CAISO will require its participants to satisfy a one-year-forward flexible capacity requirement and specific DA and RT must-offer obligations (MOO) for the capacity used to meet this requirement.

Although EIM Entities need to have sufficient resources to meet their load and operating reserves, they do not appear to be subject to the same planning requirements as CAISO participants to provide any necessary flexible capacity with a must-offer obligation. This disparity could create a situation where an EIM Entity without a similar planning requirement relies on California customers to plan for and provide the flexibility needed to balance its grid in real-time.

PG&E encourages the CAISO to work with PacifiCorp and future EIM Entities to avoid asymmetries in key planning and operations standards such as the requirement for flexible capacity.⁴ The EIM market design should ensure that EIM Entities come into the RT optimization with sufficient resources committed to meet not only the forecast load and operating reserves, but also to jointly accommodate the variability and forecast uncertainty to which the EIM dispatch must respond across the joint EIM footprint. Therefore, the CAISO should establish for EIM Entities a similar flexible capacity requirement as for CAISO participants, including a similar MOO for flexible capacity to provide economic RT bids. This issue of how to calculate and allocate the flexible capacity requirement should be addressed in the next paper and explored with stakeholders.

4. Flexibility Requirements (both forward and spot) Need to be Assessed on the Basis of the Joint EIM Footprint

Flexible capacity requirements for participants in CAISO and for participants in PacifiCorp could be evaluated separately as is done today. Or, flexibility requirements could be considered together for the expanded EIM footprint and allocated to participants both in the CAISO and the EIM Entity. This issue of whether to set flexibility requirements separately or jointly applies to two different (but related) requirements. The first requirement is the one-year-forward flexibility

³ Such as the Flexible Resource Adequacy Criteria and Must Offer Obligations initiative <http://www.caiso.com/informed/Pages/StakeholderProcesses/FlexibleResourceAdequacyCriteria-MustOfferObligations.aspx>

⁴ PG&E also wants to better understand the relationship between the EIM and the new 30-minute corrective capacity the CAISO wants to procure (see Contingency Modeling Enhancements Initiative).

requirement discussed in item #3 above. The second requirement is the flexibility reserve target that is set and procured for in the RT market.⁵

If the CAISO does not factor the impact of PacifiCorp into its determination of both the forward and spot market flexibility requirements, then the CAISO may set requirements for its California participants that are too high. A similar effect would be seen for PacifiCorp if it were to evaluate its flexibility requirements on a stand-alone basis. Without this combined consideration of a requirement, the flexibility reserve benefit could be significantly diminished (this benefit in the CAISO's study was 19-60% of the total benefit).⁶

5. Consider How Transmission Constraints and Limits in Transfer Capability Impact the Procurement of Flexible Capacity in the EIM

The proposal allows for the procurement of flexible capacity (through the enforcement of the flexible constraint or by procurement of a future flexible product) in the EIM Entity. We have two concerns that we request be addressed in the next proposal.

- a) First, flexible capacity at times has been stranded in generation pockets. PG&E recommends the CAISO provide stakeholders with an analysis on how often this happens and consider the implications on procurement of flexible reserves across the different BAAs.
- b) Second, the net transfer capability (transfer capability available to the EIM less energy scheduled or flowing) would seem to be a constraint on how much flexible capacity is procured on either side of the intertie. Not considering this limit means that the CAISO may not have access to flexible capacity procured on one side but needed on the other.

The next proposal should include a discussion on mechanisms to ensure flexible capacity procured can be delivered to the intended locations within the EIM.

6. CAISO Should Have the Ability to Commit Fast-Start Resources in an EIM Entity

The current proposal allows for the RTUC commitment of resources in the CAISO but not the EIM Entity. This one-sided treatment will likely diminish the inter-regional dispatch advantage advertised in the benefits study and is an example of the possible unfair reliance on RA planning and must-offer obligations required within California by an EIM Entity. PG&E is seeking similar unit commitment treatment across the CAISO and the EIM Entity.

⁵ The flexibility reserve is currently procured in the RT market through the enforcement of a flexibility constraint. Eventually, the CAISO will procure the needed flexibility in both the DA and RT markets via a flexibility product.

⁶ Based on the data on page 9, flexible reserve benefits range from 19% - 60% of the total benefits.

<http://www.caiso.com/Documents/PacifiCorp-ISOEnergyImbalanceMarketBenefits.pdf>

The CAISO should consider expanding EIM so that it has the ability to commit fast start resources within an EIM Entity through RTUC so long as they can be brought online. In the 15 minute market, commitment of fast-start resources bears a close resemblance to the dispatch of on-line resources. The decision to commit a fast start resource in RTUC is made based on short term load forecasts and economic trade-offs of dispatching on-line resources or committing off-line fast start resources. This differs from the commitment decisions made in the DA processes.

The CAISO should have the ability to commit fast start units in an EIM Entity in the RTUC process. Additionally, fast-start resources in the EIM Entity should have similar must offer obligations in the EIM as the CAISO's RA units (see discussion in item #3).

Resources committed in the EIM whether in CAISO or an EIM Entity should be eligible for bid cost recovery (BCR). BCR payments would be recovered via uplifts allocated across the CAISO and the EIM Entity. The stakeholder process is already addressing mechanisms to share the uplift costs including RT BCR.

7. Appropriateness of the Allocation Method for the Four Uplifts needs More Examination

The CAISO proposes to allocate the costs for four uplifts between the CAISO and EIM entities on the basis of the gross absolute real-time deviation from the DA schedules for the CAISO and the adjusted base schedules⁷ for the EIM Entity. The four charge codes identified by the CAISO for allocation to the EIM are:

1. CC6477 Real Time Imbalance Energy Offset (RTIEO)
2. CC6774 Real Time Congestion Offset (RTCO)
3. CC6678 Real Time Bid Cost Recovery (RT BCR)
4. CC7024 Flexible Ramp Up Cost

Allocation of these uplifts to the EIM Entity is appropriate. Condition changes from the adjusted base schedules in the EIM Entity may cause an increase in the RTIEO or the RTCO similar to what occurs today in the CAISO. For example, if conditions change in the RTD run (e.g., load forecast), then transmission violations may be caused by the adjusted base schedule. EIM would remove the violations in real-time, and EIM may incur RTCO as a result. In addition, the adjusted base schedule only removes violations on the EIM Entity system. Violations in CAISO may be caused by parallel flows resulting from the adjusted base schedule. So the adjusted base schedule may still cause transmission constraint violations on the EIM Entity system or the CAISO system.

⁷ Adjusted Base Schedules are balanced schedules submitted by the EIM Entity before the start of the EIM that may be adjusted by the Market Operator (CAISO) to remove transmission constraint violations on the EIM Entity system.

Similarly, the CAISO may commit units in RT to meet the needs of the EIM Entity resulting in RT BCR and the CAISO will be procuring flexibility in the spot market for the joint balancing area so allocation of some of these costs to the EIM Entity is appropriate.

Although allocation of the four charge codes is appropriate, we are less sure that the method of allocation (gross absolute deviations) is appropriate for all four codes. PG&E understands the value of using the same simple allocator for all the uplifts, but we recommend additional analysis and explanation that the proposed allocator is synchronized with all four billing determinates (allocation guiding principle #6). For example, an allocation based on the amount of uninstructed deviation may make more sense for certain uplifts, especially where uninstructed deviations drive a larger portion of the uplift. The CAISO should provide analysis and additional discussion in the next paper on the synchronization of the proposed allocators for each of the four determinants.

8. Consider Modifying the Minimum Shift Optimization (MSO) to Make the EIM More Attractive to EIM Participants

The proposal makes three clarifications regarding the Minimum Shift Optimization (MSO) process: 1) balanced base schedules are submitted at the EIM Entity Scheduling Coordinator (SC), not by the EIM Participant Scheduling Coordinator; 2) adjustments to base schedules are made at the EIM Entity SC level to remove transmission violations in the EIM Entity system and maintain balance; and 3) compensation for the adjustments in schedules will be handled outside the EIM between the EIM Entity and the EIM participants.

Even though PG&E is protected from having our day-ahead schedules adjusted by the MSO, we continue to believe this proposed approach may reduce the incentive for entities in PacifiCorp to participate in an EIM, diminishing the benefits of an EIM for all parties. As described in our previous comments, adjusting base schedules at the EIM Entity level can create settlement problems between the EIM Entity and participants in the EIM Entity. For example, suppose that two EIM Participant SCs submit balanced base schedules into the EIM. When the Market Operator adjusts base schedules to remove a transmission violation, it may increment the energy scheduled from the generator of one EIM Participant SC and reduce the energy scheduled from the generator of the other EIM Participant SC. This will create a transfer of energy from one SC to the other. The proposal does not provide any mechanism for settling the transfer between the two SCs created by its adjustment process. Instead, it plans to rely upon the EIM Entity to settle the energy transfer created by CAISO. PG&E offers two alternative solutions below to address this problem.

Alternative #1: Modified MSO

If the combined schedules violate a transmission constraint, the EIM Market Operator could use a modified MSO process that will keep each EIM Participant SC's adjusted base schedule in

balance. In this way there would be no transfer of energy created between EIM Participant SCs that would have to be settled outside EIM.

Alternative #2: Pro-rata Curtailment of Schedules

Another approach might be to curtail the EIM Participant SCs' schedules pro-rata based on their contributions to flow on a violated constraint. The EIM Market Operator could inform each EIM Participant SC of the amount of flow reduction it is responsible to provide on the constraint and the EIM Participant SC could submit a revised base schedule to provide the reduction. This would not place a disproportionate burden on any single EIM Participant SC. If the EIM Participant SC does not provide revised schedule that achieves the flow reduction instructed, the EIM Market Operator could curtail both generation and load in an EIM Participant SC's base schedule to achieve the required reduction. In this way, the EIM Market Operator is not increasing output from a generator without considering its cost. Any curtailed load would be served in the EIM at the appropriate RT LMP.

Based on our understanding, this second alternative is similar to an approach that is used in the Energy Imbalance Services (EIS) market administered by the Southwest Power Pool (SPP).

PG&E believes either alternative approach is more equitable than the proposed MSO and thus will provide the right incentive for EIM participation. Since participation in the EIM is optional for resources in an EIM Entity, participants may decide not to submit offers in the EIM to avoid having their base schedules adjusted by the Market Operator in the MSO process creating transfers of energy between participants that the Market Operator will not settle at a market price. If enough participants decide not to participate in EIM, the economic benefits from EIM could be reduced. We ask the CAISO to consider the alternative modifications in the next proposal.