



Comments of Pacific Gas & Electric Company *Energy Imbalance Market Draft Final Proposal*

Submitted by	Company	Date Submitted
Will Dong (415) 973-9267 Paul Gribik (415) 973-6274	PG&E	October 15, 2013

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 September 23, 2013 Draft Final Proposal (“Proposal”). PG&E understands the CAISO plans to present the EIM design and EIM governance proposals to the CAISO Board for its consideration in November and December 2013, respectively. PG&E prefers that the entire EIM proposal, both design and governance, be presented to the Board at the same time for approval. We see the EIM proposal as an organic whole, and consideration of all the elements must be made together. As such, PG&E will recommend that the CAISO table any decision on the EIM design until December when the governance portion of the proposal is presented.¹

Overall, PG&E sees the potential opportunity for an EIM to benefit each region and we continue to seek assurances that the benefits clearly outweigh the costs, and the design results in fair treatment of both the EIM Entities and the CAISO in regards to cost allocation and market obligations. To that end, PG&E recommends five modifications to the final EIM design:

1. The EIM design must include appropriate exit provisions (this is a broader issue that overlays both EIM design and governance);
2. The CAISO should phase in the EIM implementation by limiting the transfer capability to no more than 100 MW in the first year of operation;
3. The CAISO should have authority to dispatch committed units and commit fast-start resources in the EIM Entity;
4. The CAISO should consider allocating BCR charges between balancing area authorities (BAAs) based on hourly, not five minute, transfer flows; and

¹ Although the Board decision should be delayed until December when the complete EIM proposal is finalized, PG&E is supportive of the CAISO briefing the Board on the EIM design in November.

5. The CAISO should put in place a plan to address convergence bidding uplift allocation given the risk that EIM could exacerbate convergence bidding gaming.

PG&E has appreciated the CAISO's willingness to work with stakeholders throughout this process in making further refinements. Specifically, PG&E supports the following improvements made in the latest proposal:

- Establishment of a penalty for over-scheduling;
- Removal of the ability for an EIM Entity to avoid receiving a share of BCR costs by opting-out of unit commitment; and
- Commitment to a Board briefing on the results of EIM market simulation (CAISO indicated this commitment at the September 30, 2013 EIM stakeholder meeting).

1. EIM Design Must Include Appropriate Exit Provisions

Rules governing an EIM Entity's exit from the EIM are a key part of the market design and affect how those Entities should be treated for the purposes of Governance representation. For example, entities that share in the costs of the market, including responsibility for future capitalized costs, deserve a clear voice in governance representation, whereas those with limited cost responsibility do not deserve a similar level of governance representation (although their views should be heard in stakeholder processes). What is needed now, before the EIM design goes to the Board for approval, is a set of clear and just rules governing the possible exit from the EIM by an EIM Entity. To date these rules have received little formal discussion in the stakeholder process (i.e., the proposal makes no mention of exit provisions).²

PG&E recommends three exit provisions for EIM Entity departures:

1. An EIM Entity shall provide written notice to the CAISO two years prior to its exit from the EIM;
2. An EIM Entity shall seek FERC approval for its exit from the EIM; and
3. An EIM Entity shall be required to pay a charge upon its exit for any unfunded investments or obligations attributable to the EIM Entity and costs attributable to its exit.

To ensure that the departure of an EIM Entity is not disruptive of the CAISO markets, the EIM Entity should be required to provide sufficient written notice to the CAISO. This notice would provide time needed to prepare for the exit. At a minimum, the CAISO would need time to adjust its systems and processes (e.g., adjust its full network model). Moreover, fundamental

² The CAISO / PacifiCorp EIM Implementation Agreement includes termination rules that allow either party to terminate the agreement, but they only pertain to the initial EIM implementation. (http://www.caiso.com/Documents/Apr30_2013EnergyImbalanceMarketImplementationAgreement-PacifiCorpER13-1372-000.pdf)

real-time market changes might be necessary given the withdrawal of a major EIM Entity so that the CAISO would be required to conduct a stakeholder process followed by a period of system implementation and testing. Other regional transmission organizations (RTOs) typically require a participating transmission owner (PTO) to provide a written notice of its intention to leave the RTO one-to-two years before its exit. The transmission owner must also typically file with FERC to withdraw and provide details of how it will meet FERC requirements outside the RTO. The CAISO requires a PTO to provide two years notice of any planned exit, with FERC approval of any exit.³ PG&E recommends that an EIM Entity be subject to the same two-year notice requirement and FERC approval.

PG&E also recommends that the CAISO design include rules that would calculate an exit charge for a departing EIM Entity. The charge would be for an EIM Entity's share of any fully loaded capitalized cost or obligation incurred before the Entity's departure for the benefit of all participants, including the EIM Entity, which have not been fully recovered through grid management charge (GMC) revenue or the EIM administrative fee.

The EIM leverages current investments and will require additional future investment in software, computer systems, communications systems, and facilities to maintain and support the ongoing operation of the future EIM as new EIM Entities join and as the market's needs evolve and expand. The departing EIM Entity should bear a portion of capitalized investment which has yet to be recovered or future obligations made in part in consideration of the Entity's participation in the CAISO market. An unconditional, no-exit-charge rule violates basic cost causation principles.

The exit charge would be used to recover the following costs:

1. Capitalized costs for investments (hardware, software, facilities and infrastructure) that have not been fully recovered from the GMC, including the EIM administrative fee;
2. Future obligations or costs made in consideration of market participants; and
3. Costs attributable to the exit of the EIM Entity (e.g., changes to CAISO processes or systems to accommodate the departure).

The rules for an exit charges do not need to be prescriptive, but the CAISO should allow itself the flexibility to determine an exit charge for a departing EIM Entity, subject to FERC approval.

³ See section 3 of CAISO's Transmission Control Agreement (TCA)
<http://www.caiso.com/Documents/TransmissionControlAgreement.pdf>.

It should be noted that unlike PTOs, EIM Entities are not turning over control of their transmission facilities to the CAISO; however, the CAISO is making market design decisions, changing its market systems and processes and making investments on behalf of EIM participants.

The three exit provisions recommended by PG&E do not create unreasonable burdens on an EIM Entity. Instead, they are common sense protections for the CAISO and its participants. They help to minimize disruptions resulting from an EIM Entity's exit and ensure that an exiting EIM Entity pays its fair share of any investments made by the CAISO.

2. CAISO Should Initially Limit the EIM Transfer Capability to 100 MW for the First Year

Over the past six months, the CAISO and its stakeholders worked hard in pursuit of a robust EIM design. Given the complexity and novelty of this EIM, however, all consequences of the EIM, harmful or not, are impossible to predict. Because unforeseen issues may expose current CAISO (or EIM) customers to potentially costly market risks, safeguards for the initial EIM rollout are prudent and not premature.⁴

PG&E recommends a one-year phased implementation of the EIM by placing an upper bound on the incremental real-time transfer capability between the CAISO and PacifiCorp at 100 MW. This allows EIM to adjust flows between BAAs while still providing some safeguard against potentially significant market manipulation or disruption, which could pass simulations undetected.

Reliance on market simulations is insufficient because they are not designed to reveal *unexpected* market outcomes. Rather, the primary objective of market simulation is to ensure systems are implemented according to design and produce *expected* market outcomes. This type of simulation involves testing the new system under a set of pre-defined market transactions and then comparing the results against a set of pre-determined outcomes. Thus, in terms of detecting poor market results, market simulation is only as effective as the input it is given. Due to time constraints, inputs are typically limited to a set of known transactions that are mostly likely to occur under normal system conditions; unexpected market scenarios, even those that would result in large financial impacts, may be overlooked. In short, although market simulations provide some assurance that the new system is implemented according to design, they provide little insurance against unforeseen market risks. The proposed phase-in approach provides this missing safeguard and is appropriate regardless of the outcome of market simulations.

The CAISO should not wait for completion of the simulation before memorializing this safeguard in the design. PG&E is open to the CAISO having some flexibility to refine the transfer capability limit safeguard after the simulations. However, PG&E is seeking agreement

⁴ Responding to PG&E's previous comments on this issue, the CAISO states it is premature to develop an implementation phasing approach at this time. The CAISO suggests any phasing approach should be considered and developed after initial testing and market simulation has occurred. As explained below, PG&E believes market simulation and the phasing approach serve different objectives, provide separate benefits, and should be pursued independently.

now on the general outlines of the phasing approach since this is a key risk mitigation element of the design. PG&E also reminds the CAISO it has a long history of identifying safeguard elements well ahead of implementation simulation. This includes the establishment of bid caps and convergence bidding position limits. These were designed and agreed to as risk mitigation measures before implementation simulation.

Given the breadth and complexity of the EIM initiative, a phased implementation is prudent. It is also most appropriate during the initial year of EIM operation because the risk of poor market outcomes is highest then. This is also a time when the 100 MW limit is not unduly burdensome. The CAISO has indicated at multiple stakeholder meetings that the initial available transfer capacity is not likely to exceed 100 MW.⁵ Thus, the impact of limiting the EIM transfer for a relatively short period of time is minimal. It is important to safeguard the market used to serve over 30 million customers from unnecessary risk. Recent history has shown market risk can be as costly as hundreds of millions of dollars.⁶ The prudent approach is to phase-in transfers between BAAs during the first year of EIM when the cost of this “insurance” is low and the potential benefit is high.

In responding to PG&E’s prior comments, the CAISO indicated the proposed phase-in approach would require additional preparation and implementation cost. PG&E asks the CAISO to provide details such as the estimated costs to implement this feature and other obstacles so stakeholders can evaluate whether it is beneficial to pursue it. Given the current design already has mechanisms to limit transfers between BAAs when an EIM Entity fails the sufficiency test, PG&E believes the cost to implement the proposed phase-in approach should be small, especially relative to its benefits.

3. CAISO Should Have Authority to Dispatch Committed Units and Commit Fast-Start Resources in the EIM Entity

As currently proposed, availability of resources in the EIM Entity for dispatch or commitment is at the discretion of the EIM Participant. To maximize the inter-regional dispatch benefit as defined in the EIM Benefits Study, PG&E recommends that the Market Operator (CAISO) have the ability to dispatch and commit all Resource Adequacy (RA) equivalent resources in an EIM Entity.⁷ This will ensure that the EIM maximizes its cost saving potential. It also addresses an important fairness issue between EIM Entities and CAISO load serving entities.

⁵ Most recently at the September 30, 2013 stakeholder meeting to discuss the EIM Draft Final Proposal.

⁶ Between September 2010 and November 2012, JP Morgan Ventures Energy Corporation (JPMVEC) was able to extract \$124 million from the CAISO market through manipulative bidding practices, gaming bid cost recovery rules (<http://www.ferc.gov/EventCalendar/Files/20130730080931-IN11-8-000.pdf>)

⁷ An RA equivalent resource is one that counts towards an EIM Entity’s capacity obligations, similar to RA resources that count towards the capacity requirements established for the CAISO BAA.

It is important to develop capabilities to capture inter-regional dispatch benefits because they make up a significant portion – as high as 66% under one scenario – of the overall EIM benefits.⁸ PG&E understands that the inter-regional dispatch benefit in the Benefits Study was based on modeling that did not artificially restrict resources in PacifiCorp from commitment or dispatch in the EIM. This study assumption may be materially incorrect under the current proposal. At a recent EIM meeting hosted by the Bonneville Power Administration (BPA), PacifiCorp representatives indicated that its two EIM Entities will bring 3,000 MW of supply resource to the EIM. This is less than one third of PacifiCorp's peak demand.⁹ Since lower access to PacifiCorp resources and other RA equivalent units lessens the possible EIM benefits, it is in the interest of all participants to adjust the EIM's dispatch and commitment authority for EIM Entity resources.

Allowing equal access to resources across the EIM is also fair. Under the EIM, CAISO resources that count for RA and are not out-of-service are generally available to the Market Operator for commitment and dispatch. This supply pool can serve roughly 115% of CAISO's peak demand, much more than the 33% of capacity expected from PacifiCorp. This asymmetric provision of capacity may also lead to unexpected market outcomes or some forms of "leaning".

Rectifying this situation is easy. Based on our understanding, similar availability and commitment rules may already exist in EIM Entities and should be expanded to apply to EIM instructions. For instance, per PacifiCorp's OATT, "Network Resources" must be made available to the Transmission Provider for re-dispatch to alleviate any transmission constraints, so long as the re-dispatch is performed on a least-cost, non-discriminatory basis.¹⁰ Since the EIM will dispatch resources on a least-cost, non-discriminatory manner, this broadening EIM rules to require availability for EIM "network resources" seems already consistent with PacifiCorp's tariff.

4. CAISO Should Consider Allocating BCR Charges Between BAAs Based on Hourly, Not Five Minute, Transfer Flows

The latest proposal would calculate eligible Bid Cost Recovery (BCR) shortfall values for a given resource for each five minute interval. BCR calculations at a 5 minute granularity, however, create a mismatch between the physical processes and costs associated with BCR and its calculation. The CAISO should use hourly "flow" calculations instead.

⁸ The low transfer capability scenario shows an interregional dispatch benefit of \$14.1 million, out of a total benefit of \$21.4 million (<http://www.caiso.com/Documents/PacifiCorp-ISOEnergyImbalanceMarketBenefits.pdf> page 32).

⁹ According to its FERC Form 1 filing, PacifiCorp's 2012 peak demand was 9,831 MW.

¹⁰ See PacifiCorp OATT, Section 30.5 "Network Customer Redispatch Obligation" (http://www.oatiaoasis.com/PPW/PPWdocs/20120209_OATTMASTERwRateCase.pdf); A Network Resource counts towards a Network Customer's capacity obligation to meet its share of system peak demand.

The calculation for the recovery of bid costs is not evaluated on a 5 minute basis for good reason: BCR shortfalls incurred in one five minute interval may be the result of commitment decisions at another, more profitable time. For this reason, the real time BCR for a given CAISO resource is calculated across the period of a day.

Hourly calculations of “flow” for purposes of BCR allocation make sense because an hour better matches the physical processes and costs associated with committing resources (e.g., minimum up time, minimum load costs) and the decisions to incur these costs. These decisions are forward looking, e.g. up to seven RTD intervals or multiple RTUC intervals, and *never* traceable to a single five-minute “look-ahead”.

Beyond that, allocation by individual 5-minute interval costs among different BAAs may run contrary to the CAISO’s stated cost-causation principles. Consider the following scenario. Resource A is committed in one BAA (BAA #1) at a time where it is revenue-positive in order to meet the needs of another BAA (BAA #2). This will result in a positive net transfer from BAA #1 to BAA #2 during these initial intervals. In subsequent 5-minute intervals, however, system conditions change and the energy bid from Resource A is no longer economic and the net flow between these two BAAs is reduced to zero. Because of resource constraints (i.e. minimum up time) this same resource will now start recording shortfall amounts in these subsequent intervals. However, because the net flow is zero in these 5-minute intervals, none of the BCR shortfall suffered by Resource A be assigned to BAA #2. Contrary to cost-causation principles, this situation creates the outcome whereby the BAA that benefitted from the commitment nevertheless avoided paying for the resulting BCR costs, and participants in BAA #1 bear an exaggerated BCR cost obligation that they would not have otherwise incurred.

Because the majority of stated generation costs are dealt with on an hourly basis (e.g., Energy and Ancillary Services costs, Minimum Load Costs), it would be more accurate to allocate BCR costs on an hourly basis. The CAISO should consider the merit in adopting such an approach.

5. CAISO Should Put in Place a Plan to Address the Cost Allocation Loophole Associated With Convergence Bidding

A costly loophole exists in today’s CAISO market. Virtual schedules can profit from differences between the Day Ahead (DA) and Real Time (RT) modeling of transmission constraints and drive up Real Time Congestion Offset (RTCO) costs. In 2012 alone, this unintended outcome cost California load over \$70 million. By assigning the RTCO costs solely to physical demand, the current cost allocation methodology provided a perverse incentive for convergence bidders to take advantage of these modeling issues. No evidence exists that this practice of arbitraging outages is improving reliability or market efficiency, and PG&E believes addressing the RTCO cost allocation is appropriate to shield load from the uplift costs associated with this bidding

strategy. This issue is well documented in a DMM white paper, along with a proposed cost allocation fix.¹¹ Yet to date, the CAISO has not closed this cost allocation loophole.

It is PG&E's expectation that while the EIM, along with network model and scheduling enhancements being developed in the Full Network Model (FNM) expansion initiative, may be helpful in mitigating the problem to some degree, they may not be sufficient to fully eliminate the problem. The FNM expansion initiative will improve the transmission model used in CAISO's Day-Ahead market; however, the accuracy of the loop flow estimates in the Day-Ahead market will also depend to a large degree upon the accuracy of the schedules modeled in the Day-Ahead market for the EIM Entities and other external BAAs. It is unclear that CAISO will be able to obtain scheduling information from external entities that are sufficiently accurate and timely to adequately model the loop flows from external entities on the CAISO network in the Day-Ahead market and so sufficiently mitigate the potential for RTCO exposure to CAISO loads arising from inaccurate loop flow models in Day-Ahead.¹² For this reason, PG&E and other California loads have been asking the CAISO to modify the current cost allocation methodology before EIM implementation.¹³ Yet, rather than addressing the root cause, the CAISO seems to depend upon its ongoing and future modeling enhancement initiatives to provide sufficient remedies.¹⁴

Fortunately, a clear fix is ready and available. To remove the underlying loophole, the DMM recommends modifying the existing cost allocation methodology, and allocating a portion of RTCO costs incurred on a transmission constraint back to Convergence Bidders who received revenues that were in part funded by such uplifts. The CAISO has adopted this recommendation for constraints in the PacifiCorp BAAs, thus closing out the impact of the loophole on

¹¹ See DMM Paper "Real-time Revenue Imbalance in CAISO Markets, April 24, 2013.
http://www.caiso.com/Documents/DiscussionPaper-Real-timeRevenueImbalance_CaliforniaISO_Markets.pdf

¹² Before CAISO runs its Day-Ahead Market, it can attempt to gather information regarding the schedules EIM Entities and other external BAAs will have going into the Real-Time market. However, there is no way that the CAISO can enforce a requirement that EIM Entities and other BAAs provide accurate schedules for use in its Day-Ahead market. In fact, the EIM proposal allows EIM Entities to submit schedule information up to 75 minutes prior to the hour for which the EIM will be run which is well after CAISO runs its Day-Ahead market. By not modeling EIM Entities' and other external BAAs' final schedules in the CAISO's Day-Ahead market, a constraint within the CAISO BAA that is not binding in its Day-Ahead market can bind or be violated when the CAISO's Day-Ahead schedule and the EIM Entities' and other external BAAs' final base schedules are considered together. This creates a modeling difference between Day-Ahead and Real-Time markets which marketers may exploit.

¹³ See comments from SCE on 3rd Revised Straw (<http://www.caiso.com/Documents/SCE-Comments-EnergyImbalanceThirdRevisedStrawProposal.pdf>) and from Six Cities (<http://www.caiso.com/Documents/SixCities-Comments-EnergyImbalanceThirdRevisedStrawProposal.pdf>).

¹⁴ See previous CAISO response to stakeholder comments http://www.caiso.com/Documents/EIM_SecondRevisedStrawProposalStakeholderCommentsMatrix.pdf (p. 27) and <http://www.caiso.com/Documents/StakeholderCommentsMatrix-EIM-ThirdRevisedStrawProposal.pdf> (p. 8).

PacifiCorp's customers. PG&E supports this approach, and asks the CAISO put in a place a plan to address similar issue for CAISO constraints through a separate stakeholder initiative.

To minimize the potential exploitation of this existing loophole under an EIM, the CAISO should commence a new stakeholder initiative as soon possible to implement the DMM proposal within the first year of EIM operation. PG&E is not asking for a delay in the EIM implementation to address the cost allocation issue before EIM go-live. However, we are asking the CAISO to present a plan to address the issue, including a commitment to a separate stakeholder process with a proposed start and end date.