

**Comments on Realtime Imbalance Energy Offset (2011)**  
**And Impact of Convergence Bidding on Interties**  
**Revised Straw Proposal**

Submitted By	Company or Entity	Date Submitted
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On June 10, 2011, the California Independent System Operator Corp. (“CAISO”) issued a paper entitled “Impact of Convergence Bidding on Interties: Revised Straw Proposal.” The Revised Straw Proposal (“proposal”) calls for (a) the immediate suspension of convergence bidding on CAISO interties; (b) additional measures to prevent implicit virtual bidding on the interties; and (c) establishes a threshold for making an emergency filing to implement a settlement rule addressing “balanced positions” that are paid the difference between prices in the Hour-Ahead Scheduling Process (“HASP”) and prices in the Real-time Dispatch (“RTD”).

The proposal consolidates two related stakeholder efforts: (a) Redesign of the Real-Time Imbalance Energy Offset; and (b) Price Inconsistency Caused by Intertie Constraints. Powerex Corp. (“Powerex”) appreciates the opportunity to have participated in those stakeholder initiatives, and is pleased to provide these comments on the current Revised Straw Proposal.

**1. Powerex supports most of the key elements of the Revised Straw Proposal**

**1.1. Powerex supports suspending convergence bidding on the interties**

CAISO proposes to suspend convergence bidding on interties. Powerex supports this aspect of the proposal for several reasons. First, it resolves the immediate issue of intertie awards potentially being inconsistent with bid prices when an intertie is congested. This issue arises from the dual constraints enforced at each intertie (*i.e.*, that net physical schedules must not exceed the scheduling limit and that net physical *and* virtual schedules combined must not

exceed the scheduling limit).<sup>1</sup> Second, it explicitly addresses a type of activity identified by CAISO as contributing to increasing Real-Time Imbalance Energy Offset.

Powerex agrees with the comments of the CPUC on the June 17, 2011 stakeholder conference call that “the root causes [of persistent price divergence] need to be addressed.” There are fundamental market design reasons that lead to the persistent price divergence that has been observed, especially between HASP and RTD. There are also fundamental market design reasons why this divergence has proven unresponsive to convergence bidding.

As Powerex has previously stated, the sole guiding objective of convergence bidding within the CAISO framework is to improve the efficiency of the commitment and dispatch of physical resources. Notwithstanding the risk management and trading uses of convergence bidding by market participants, it is not CAISO’s primary obligation to provide the platform for such transactions. Under both circumstances at the core of the prior stakeholder initiatives – convergence bids on congested interties and convergence bids that are part of a balanced and offsetting pair of convergence bids – the convergence bids do not improve the commitment and dispatch of physical resources. Hence, their temporary elimination is the most direct manner to address the associated cost and operational issues.

Powerex is aware that many stakeholders oppose the suspension of convergence bidding on interties, which is not surprising given that virtual transactions can be an important part of an entity’s commercial activity. Nevertheless, there is simply no sense in preserving an activity that does not advance the core obligation of CAISO – the reliable and efficient operation of the grid – while leading to significant costs and operational challenges. Moreover, Powerex believes that CAISO’s and stakeholders’ resources are best directed toward developing a durable long-term design rather than overlaying near-term fixes to resolve the unintended consequences, which have a tendency to produce still more unintended consequences requiring still more near-term fixes.

This does not mean that convergence bids on interties should be abandoned permanently. With several design changes to the real-time market, convergence bidding on the interties could and should be reintroduced as a valuable manner to improve convergence between the day-ahead Integrated Forward Market (“IFM”) and the HASP. Internal convergence bids settle against the IFM and the RTD, and hence will respond to the price signals between those two markets. As

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<sup>1</sup> Powerex believes that the bid inconsistency issue has much broader negative implications to market efficiency than the one identified in the CAISO stakeholder process on the issue. The concern identified in the stakeholder process was IFM physical intertie dispatches at LMPs that are inconsistent with the respective bid prices. However, Powerex believes that the asymmetric treatment of convergence bidding on the interties results in economically incorrect intertie LMPs in a large number of IFM hours. Powerex has observed numerous instances in which a small quantity of net convergence bids in the direction opposite to physical congestion improperly sets the price for all awards on that intertie. While the incidence and cost of bid-inconsistent awards may be limited, all awards in the much broader set of instances of net convergence awards in the opposite direction of physical congestion are improperly priced. Consequently, a focus on only the awards that are inconsistent with their bids greatly understates the issue.

discussed in Section 3, Powerex supports continued efforts toward a long-term market redesign that reinstates convergence bids between the IFM and HASP.

### **1.2. Powerex supports charging HASP imbalances the RTD price**

CAISO proposes to charge real-time imbalances on HASP awards the RTD price. Powerex supports this change, since currently HASP imbalances result in either rescission of the HASP price or modest rule-based charges. Powerex agrees with CAISO's observation that "A non-performing HASP sale results in the ISO purchasing that energy from internal resources in the RTD." CAISO's proposal that "[f]ailure to perform on HASP awards should be charged the RTD price, independent of the magnitude, frequency or reason for such failure" is entirely consistent with the principle of cost-causation, which Powerex believes to be a cornerstone of efficient price signals.

### **1.3. Powerex supports measures to eliminate implicit virtual bidding**

CAISO proposes an additional measure intended to discourage virtual bidding. Specifically, it proposes to extend allocation of the Real-Time Imbalance Energy Offset to HASP reductions on IFM import awards. Powerex strongly support measures to ensure that all awards are capable of reliable physical performance. However, this particular rule may not be the most effective way of achieving that objective as it will also deter truly physical suppliers from providing much needed economic adjustment bids in HASP.

Additionally, neither this rule nor the existing IFM-HASP clawback directly address the implicit virtual transactions achieved by cutting (or failing to tag) a physical IFM award in real-time. In Section 2, below, Powerex proposes alternative measures that it believes will directly address the problem and reduce the Offset. Powerex believes that reducing the Offset by addressing the root cause directly is preferable to spreading out the allocation to more transactions and participants. In fact, Powerex believes that the CAISO should more stringently adhere to charging the Real-Time Imbalance Energy Offset to the load served by the CAISO, which should be defined as CAISO load plus *net exports by SC*, as opposed to the current application of the charge against *gross exports*. By addressing the root causes of the Real-Time Imbalance Energy Offset and recovering it in a manner consistent with cost causation principles, the Offset will be both reduced and appropriately charged to the activities associated with serving each SC's load (including load served via an SC's net exports).

### **1.4. Powerex does not support the proposed settlement rule**

CAISO proposes to implement a settlement rule that claws back profit from "balanced convergence bids", but only if the 30-day rolling average of the Real-Time Imbalance Energy Offset exceeds \$20 million. Powerex does not support this rule, as it does not address some key ways in which balanced convergence bids could continue to exploit persistent HASP-RTD price divergence. For example, the settlement rule applies only to convergence bids that are balanced within a single Scheduling Coordinator ("SC"). While the rule eliminates the incentive to deliberately undertake this strategy, CAISO's analysis shows that significant Offset costs will remain due to offsetting convergence bids submitted by *different* SCs. Additionally, as was pointed out on the June 17 stakeholder call, SCs could avoid the settlement rule by submitting the intertie virtual supply bid under a different SC ID than its internal virtual load bid.

## **1.5. Maintaining the status quo is not an acceptable outcome**

Powerex urges CAISO to reject calls to maintain the status quo. The immediate issues leading to this initiative – the large Real-Time Imbalance Energy Offset amounts being allocated to load and the potential for intertie physical awards to be inconsistent with their bids – are sufficient grounds to conclude that the current design must be changed. As discussed more fully in Section 2, however, Powerex believes that an important root cause needs to be addressed: the lack of transparency and enforcement regarding firmness of physical intertie awards. This creates perverse incentives for import awards to not carry the balancing reserves necessary to permit CAISO to reliably count on these external resources to serve load; masks this non-performance risk, which jeopardizes reliability; and shifts the costs of “firming” these imports onto CAISO load.

Powerex supports most of the elements of the Revised Straw Proposal, and provides recommendations for additional intermediate- and long-term improvements to improve reliability and eliminate cost-shifting of reserves to CAISO load. Ultimately, these improvements will also permit convergence bids to achieve what they were intended to do: improve the efficiency of commitment and dispatch of physical resources. At that point, Powerex would support the re-introduction of convergence bidding on the interties.

## **2. Intermediate changes to ensure reliable intertie physical awards**

In its prior comments regarding the Real-Time Imbalance Energy Offset, Powerex described a design flaw in how CAISO liquidates internal convergence bids. Namely, that these are effectively liquidated in the HASP optimization run rather than being preserved until RTD. Powerex believes that this design is a significant contributor to divergence between HASP and RTD prices. In particular, it explains the pattern of intertie DEC awards (*i.e.*, exports) that clear in the HASP, only to see CAISO INC internal resources in the RTD. Powerex proposed a rule that would require CAISO to preserve internal virtual bids through the HASP and into RTD, which would avoid the outcome described above.

### **2.1. Reliability concerns over Powerex’s proposed HASP rule reflect a deeper problem**

In the June 10 paper, CAISO agreed with Powerex’s description of how it presently treats internal virtual awards in the HASP. CAISO also agreed with Powerex that this approach undermines the convergence of HASP and RTD prices that otherwise would occur, and it agreed that Powerex’s proposed rule would address this design flaw, leading to convergence between the IFM, HASP and RTD. CAISO opposes implementing the rule change at this time, however, since it would potentially prevent CAISO from dispatching incremental resources in the HASP, limiting it to only RTD (and hence only to internal resources) to serve load. Powerex notes, however, that this concern would not frequently arise under the market patterns observed to date, in which CAISO’s actions in the HASP generally indicate a view that it will have excess resources. Under current conditions, CAISO may be more concerned that it would be prevented from dispatching decremental resources in the HASP, limiting it to only RTD (and hence only to internal resources) to reduce over-generation conditions.

Nevertheless, Powerex acknowledges that CAISO's principal obligation is the reliable operation of the grid, and that CAISO is the entity best situated to make judgments regarding what it needs to accomplish such reliable operation. Moreover, Powerex has previously explained that virtual bidding behavior responds to *average* returns on a particular trading strategy, and hence a real-time resource shortfall may well arise even when the general pattern has been for real-time resource surpluses (and vice versa). Powerex does not dispute CAISO's stated concern that the proposed rule would place external resources either entirely or partially "off limits".

CAISO's reliability concern raises a larger critical question, however. Namely, what are the root causes behind the need for large quantities of real-time dispatch? While uncertainty about actual load relative to forecast load is surely one factor, this should be an unbiased uncertainty, and does not explain the persistent need for incremental real-time resources. The more likely explanation is chronic non-performance or under-performance by resources with IFM awards. This is especially likely for intertie awards, where the physical resource behind the schedule is not known until - and if - a valid electronic transmission tag ("e-tag") is submitted and approved. Non-performing schedules are effectively like virtual bids: they displace awards to other resources in the IFM, requiring CAISO to procure alternative supply in a later market. Unlike explicit virtual bids, however, non-performing awards are not actually revealed to be non-performing until real-time, by which time CAISO is limited to relying on internal resources to balance the shortfall in supply. Therefore, CAISO needs to take additional steps to ensure that physical commitments in the IFM and HASP actually perform.

## **2.2. The firmness of energy schedules must be transparent, and pricing should reflect its impact on reliability**

In order to ensure reliability, CAISO must be able to distinguish between awards that are able and intend to physically deliver the awarded quantity and those that are not. Implicit virtual bidding (*i.e.*, physical IFM awards that are bought back in the HASP, with no intention of actual delivery) confounds this distinction, and CAISO has consistently expressed the need to eliminate it. Where implicit virtual bidding entails a physical schedule with *zero* intention of delivering, Powerex believes many of the same reliability concerns arise with physical schedules that have a material risk of being unable to deliver.

Non-performing physical awards lead to essentially the same reliability outcome that CAISO finds problematic with implementing Powerex's proposed HASP rule at this time: through the misplaced expectation of performance, they prevent CAISO from recognizing a supply shortfall until real-time, by which time its options will be more limited. Awards with a significant risk of non-performance are akin to energy without capacity; they can substitute for more expensive resources when available, but CAISO must have sufficient alternative resources available in case they are not. In the June 10 paper, however, CAISO stresses "the importance of imports to the ISO meeting load." In other words, reliable operation requires that CAISO have reliable capacity on the interties, not just cost-reducing energy if it happens to be there.

There are two primary aspects in the current CAISO design that impair its ability to assess the performance risk of specific intertie awards. First, IFM intertie awards do not presently need to submit valid e-tags until shortly before real-time operation. This delays verification of the specific physical resources and transmission service necessary for physical delivery of the

awarded quantity, and hence extends the uncertainty of performance. Second, the self-declared energy product types are not being appropriately enforced by CAISO. Schedules that can be interrupted for reasons other than qualifying contingencies are not being identified as “interruptible”, and hence both the risk of non-performance as well as the cost of protecting against that risk are being passed onto CAISO load.

The net result is that, under its current rules, CAISO is unable to make an assessment of the likelihood of non-performance, and it is unable to charge less reliable awards their appropriate share of the additional contingency reserves or Reliability Unit Commitment (“RUC”) capacity needed to maintain system reliability in light of the performance risk.

### **2.3. Consequences of under-performing inertia awards**

Consider two inertia IFM physical awards: Schedule 1 and Schedule 2. Schedule 1 will be from a source Balancing Area (“BA”) carrying the balancing reserves needed to ensure that the schedule can be delivered. Schedule 2 will be from a source BA carrying fewer balancing reserves, and reserving the right to cut the schedule in proportion to the actual output of certain designated facilities. At the time of the IFM (or HASP), CAISO knows nothing about the source of the offers. Both are offered under the product label of “firm”, and hence neither one is charged a share of CAISO’s own reserves. Schedule 2, however, obviously faces lower costs, since its BA is carrying fewer reserves. It therefore enjoys a competitive advantage over Schedule 1, which may either be displaced entirely (*i.e.*, it will not clear the IFM at all) or will receive an IFM price that is depressed relative to what it would be if cost-advantaged offers such as Schedule 2 were not present.

The present failure to distinguish between Schedule 1 and Schedule 2 has several detrimental consequences:

1. If CAISO is unaware of the increased non-performance risk of Schedule 2, it may fail to make RUCs or to obtain additional operating reserves, reducing reliability.
2. To the extent that CAISO recognizes some level of performance risk and commits additional capacity, the cost of these commitments are borne by load.
3. When schedules actually fail to perform, they place greater demands on internal resources in the RTD, raising the System Marginal Energy Cost (“SMEC”) paid by all real-time load.
4. Since non-performing offers compete with firm offers for IFM awards, the price received by firm awards will fail to reflect the value of this higher level of performance. This creates an incentive for participants to avoid incurring the cost of carrying a full complement of balancing reserve in the source BA, since there is no benefit to doing so.

This last point bears elaboration. In the hypothetical example, both Schedule 1 and Schedule 2 receive the same price. From the vantage point of Schedule 1, it has “wasted” money by maintaining a higher level of reserves. The additional reserves neither earned it a higher price nor insulated it against charges imposed on Schedule 2. The clear economic incentive for BAs throughout the WECC is therefore to not carry full balancing reserves to ensure physical delivery of schedules to the CAISO. If all BAs in the region were to follow this incentive, a widespread reliability emergency would not be difficult to imagine.

## 2.4. Recommendations to improve transparency and apply cost-causation principles

Powerex believes that the reliable operation of the CAISO grid – and that of the entire region – would be enhanced by having greater transparency into the physical resources supporting intertie awards. This greater transparency can facilitate the application of cost-causation principles such that intertie awards bear the appropriate cost of managing the risk of their non-performance. This would not only achieve a more equitable allocation of costs, but would send the appropriate price signals to discourage inefficient behavior.

Specifically, Powerex urges CAISO to consider two additional measures among its intermediate reforms. First, CAISO should clarify that the energy product types “firm” and “unit contingent” are appropriate only for schedules in which the source BA is carrying balancing reserves sufficient to ensure physical performance of the awarded amount; the distinction between “firm” and “unit contingent” should be clarified to apply only to curtailability due to contingency events. This clarification of firm and unit contingent energy types would be consistent with industry practice in much of the WECC.

The variable resource’s economic choice to be backstopped (or not) by sufficient balancing reserves at the source is not a qualifying “contingency” under which CAISO may deploy its contingency reserve pool. CAISO should clarify that schedules that may be interrupted due to energy unavailability should be identified as “interruptible” energy. CAISO should procure operating reserves of 100% of interruptible awards, and charge those reserves directly to the interruptible schedules. This does not mean that the entire quantity of imports from variable resources should be treated as interruptible, but rather that the portion that may be curtailed, absent a contingency event, is interruptible. The portion of the award that is highly reliable –as a result of probabilistic analysis and the procurement of sufficient balancing reserves at the source BA – would appropriately be treated as firm. This clarity is vital to ensuring reliability and preventing non-firm imports (and their source BAs) from “free riding” on reserves paid for by CAISO load. By more fully reflecting the capacity value of firm energy, firm resources will no longer face a price signal to reduce their balancing reserves.

Second, CAISO should require that physical awards, particularly for firm or unit contingent energy, submit valid e-tags in the day-ahead timeframe. This will provide CAISO with more timely information about the physical resources underlying the IFM awards, and provide verification that physical resources have been committed for that award. Failure to provide a valid e-tag should result, at a minimum, in the award being re-declared as “interruptible” and charged for 100% of reserves in the subsequent HASP market, when the CAISO is able to procure additional reserves.

There should not be liquidity concerns arising from a strict requirement for valid e-tags in the day-ahead time-frame for firm and unit contingent energy types given that, on average, 95%<sup>2</sup> of all physical IFM intertie awards already adhere to this timeframe. Eliminating a relatively small

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<sup>2</sup> CAISO Issue Paper E-Tag Timing Requirements Initiative states that 95 percent of day-ahead schedules are e-tagged within the WECC Pre-scheduling timeline. <http://www.caiso.com/244e/244ed62b6a700.pdf>

subset of intertie bids that can pose serious reliability and cost consequences is an appropriate step consistent with the CAISO's core objective.

## **2.5. Eliminating other forms of implicit virtual bidding**

CAISO has already put in place a rule to discourage implicit virtual bidding. The type of implicit virtual bidding addressed by the IFM-HASP clawback rule consists of an IFM physical award that is bought back in the HASP, without ever having had either the capability or intention to physically deliver on the initial IFM award. Call this approach "Type 1" implicit virtual bidding. The IFM-HASP clawback rule removes any financial gain that may arise from Type 1 implicit virtual bidding, and Powerex believes it is sufficient to discourage the practice.

There is an alternative way to implement implicit virtual bids, however. This consists of a physical IFM import (export) award that is simply cut in real-time. It could also apply to a HASP award that is cut in real-time. Such cuts result in the participant paying (receiving) the RTD price. Call this approach "Type 2" implicit virtual bidding. If the IFM-HASP clawback rule effectively discourages Type 1 implicit virtual bidding, participants will likely use Type 2 strategies. This creates even greater reliability problems for CAISO, since the imbalance can be resolved only through internal resources in the RTD.

Powerex believes it would be appropriate to extend the IFM-HASP clawback principles to Type 2 implicit virtual bidding. Namely, that any gains from the practice must be forfeited, while the participant is still liable for any losses. Specifically, IFM or HASP intertie awards that fail to perform should be charged (paid) the worse of the HASP or RTD price. This modification would replace the existing formula-based charges for failure to deliver (receive) on HASP awards. Powerex recommends that this change be implemented at the same time as the suspension of convergence bidding on the interties to prevent an increase in implicit virtual bidding activity.

Since Type 2 implicit virtual bids are no different than other types of non-performance, its use will also be discouraged by the prior recommendations for day-ahead submission of e-tags as well as enforcement of the energy product codes.

## **2.6. Settling external convergence bids at the RTD price offers little benefit**

During the course of the stakeholder process, some have argued that convergence bidding on the interties should be preserved, but that they should settle against the RTD price. This approach has superficial appeal, since it would eliminate the Real-Time Imbalance Energy Offset costs attributable to balanced convergence bids. The other complications associated with convergence bidding on the interties, however, would persist. The challenges arising from the asymmetric treatment of virtual bids on congested interties would not be resolved by this change, meaning the potential for awards inconsistent with bids would still be there. This would bring us back to the stakeholder impasse regarding whether there should be separate prices for virtual and for physical awards at the interties.

Moreover, what legitimate purpose would be served by convergence bidding activity on the interties that settled against the RTD price, given that nearly all physical intertie awards settle against the IFM or HASP price? Internal convergence bids can already be used to converge

system energy prices between IFM and RTD, suggesting that convergence bidding activities on the interties would be solely to converge the congestion component of intertie IFM and RTD LMPs for the small subset of physical intertie awards that settle at the RTD, namely dynamic intertie resources.

Moreover, as discussed above, there are multiple forms of both explicit and implicit virtual bidding. These will continue to be pursued by participants as long as the persistent price divergence across CAISO's markets exists; it simply will be too profitable not to. What new market opportunities and outcomes will arise from physical intertie awards settling at the HASP price while convergence bidding awards on the same intertie settle at the RTD price? Of course, some will then suggest that physical intertie HASP dispatches also settle against the RTD price, which will require deciding whether imports should have a bid cost guarantee, whether this should apply to exports, ... etc. It should be abundantly obvious that the potential for unintended consequences grows with such iterative tinkering.

Simply put, persistent price divergences such as those observed in CAISO's sequential markets will always attract transactions whose intention is to profit from those prices rather than to deliver physical energy. For these reasons, Powerex believes that CAISO should adopt the recommendations to more clearly identify those awards that can be relied upon to perform from those that are less likely to do so. Transaction types, such as convergence bids on the interties, that are purely financial and that do not currently improve the efficiency of the commitment or dispatch of physical resources should be suspended altogether. They should be re-introduced following implementation of longer-term changes that would permit efficiency to be improved through this activity without raising concerns about reliability.

It would be a serious mistake for CAISO to simply succumb to the pressure from certain market participants to maintain convergence bidding activities on the interties in some hastily revised form. To do so would be to place the commercial desires of a subset of market participants ahead of the core objective of the CAISO: the efficient and reliable operation of the grid.

### **3. Long-term changes are necessary before convergence bidding can be reintroduced**

While the prior recommendations can be implemented in the intermediate term, additional beneficial changes should be considered over the longer term.

#### **3.1. Extend RUC to external resources and to decremental commitments**

Powerex notes that CAISO's reliability concern with employing Powerex's algorithm change is with its ability to *commit* incremental or decremental intertie generation in the HASP to *be available* for RTD dispatch should it be needed. The CAISO currently achieves this commitment via dispatching the interties with an energy award for the entire hour in the HASP. Through this HASP process the CAISO achieves the desirable reliability effect of committing generation to be available in the RTD from the interties. This action has the undesirable effect of distorting the price that would otherwise occur in the RTD, however. This distortion of RTD prices by CAISO "stepping into the market" in the HASP is a primary obstacle to the CAISO's ability to

employ intertie convergence bidding with price convergence outcomes. This distortion of RTD prices also reduces the efficiency of internal convergence bidding activities to converge IFM and RTD prices.

In contrast to the HASP intertie commitment, the CAISO achieves its desired unit commitment internally in the IFM time frame via the independent RUC process. This RUC process effectively provides the CAISO with a vehicle to commit internal generation without directly impacting the IFM prices. Prices in subsequent markets (HASP and RTD) will reflect the participation of additional resources that otherwise might not have participated, but the decision of how much energy to procure from those resources is still left to the market. Powerex believes that direct interference in the energy markets can be minimized by expanding CAISO's options in the RUC process. In Powerex's view, two significant changes should be pursued. First, RUC should be extended to allow for commitment of external resources in addition to internal resources. This would reflect CAISO's observation that "[i]n periods of high load, ISO operations must have all internal and external resources available to meet ISO demand." The ability to enter into reliability commitments with external resources will be greatly aided by – and likely requires – the improvements in e-tag submission and enforcement energy product types discussed above.

Second, the RUC should be extended to include decremental as well as incremental commitments. While CAISO's comments have focused on the need for incremental resources, other conditions may exist in which the ability to resolve an over-supply condition is needed.

Powerex believes that if the CAISO had the mechanisms to *commit* incremental and decremental generation, including the interties, in both the IFM and HASP timeframes, then it could successfully reduce its impact on RTD energy prices. This would pave the way for the CAISO to successfully implement convergence bidding both internally and on the interties between the IFM, HASP and RTD. This would also effectively replace Real-Time Imbalance Energy Offset charges with RUC charges that could be allocated in a manner consistent with cost causation principles, rather than collected from load and exports.

### **3.2. Develop a binding Hour Ahead Market to replace HASP**

The core issue behind the increase in Real-Time Imbalance Energy Offset is the fact that the quantities that settle against the HASP or against the RTD do not net to zero. This leaves CAISO exposed to the difference between the HASP and RTD prices, undermining revenue neutrality.

Powerex supports consideration of replacing HASP with a binding Hour Ahead Market ("HAM") in which offered supply clears against bid-in demand. As discussed above, CAISO would be able to use an hour-ahead RUC process to ensure sufficient capacity is committed to reliably serve load, rather than using its forecast as the basis for its HASP optimization.

### **3.3. Intertie convergence bids should be for energy only**

Convergence bidding on the interties can and should be re-introduced to foster convergence between IFM and HASP prices. However, the reintroduction of convergence bidding on interties should not repeat the past problems that arise from their asymmetric impact on congestion. Namely, net convergence bids as initially implemented could cause congestion, but they could not relieve it.

Powerex understands and agrees that net convergence awards cannot be used to create counterflow space and permit additional physical awards to clear the market. Doing so would necessarily result in a quantity of physical schedules that exceeds the interface scheduling limit. Powerex believes, therefore, that convergence bids also should not be treated as causing (or contributing to) congestion. Such asymmetric treatment is the underlying cause behind the bid inconsistency issue, the notion of two different inertia LMPs (one for physical awards and one for virtual awards), and possible outcomes that undermine rather than improve the commitment and dispatch of physical resources.

For these reasons, Powerex would support the future reintroduction of convergence bids that settle between the IFM and HASP prices, but only for the energy component of LMP. In other words, they would help converge the System Marginal Energy Cost ("SMEC"), but would not attempt to converge the marginal congestion cost at a given inertia. As discussed in Powerex's prior comments, a range of implementation issues exist which would benefit from additional stakeholder participation.

Thank you for taking the time to consider Powerex observations and recommendations.