

**Opinion on  
Revisions to Import Bidding and Market Parameters for  
Compliance with FERC Order 831**

by

James Bushnell, Member  
Scott M. Harvey, Member  
Benjamin F. Hobbs, Chair

Members of the Market Surveillance Committee of the California ISO

September 9, 2020

**I. Introduction**

The Market Surveillance Committee (MSC) of the California Independent System Operator (CAISO) has been asked to comment on the ISO's proposal for compliance with FERC order 831.<sup>1</sup> The initiative leading to this proposal has been discussed during MSC meetings on Dec. 6, 2019, May 8, 2020, and July 30, 2020.

There are two key aspects to this proposal: the determination of allowable offer prices and the setting of penalty values and market prices. We support the approach of screening offers above \$1000/MWh from specific resources using methods also utilized for other market power screening purposes. We also support the proposal for calculating a maximum import price based upon regional bilateral price indices. Although Order 831 was primarily concerned with periods of very high gas prices, experiences with the mid-August heat-wave demonstrate the need for allowing for higher priced import offers (and export prices) during periods of regional scarcity. As we discuss, below, however, there are challenges with adapting these multi-hour bilateral index prices for use as an hourly import price screen, and the CAISO should carefully monitor and be ready to modify, if necessary, its formula for calculating these prices.

We also support the proposal's approach to setting penalty values, which determine market prices during periods of scarcity. Our support, however, is based upon the fact that this initiative was intended to focus primarily on allowable offers and not on the wider set of issues associated with the topic of scarcity pricing. Given this fact, we believe the compromises made in the development of this proposal are reasonable and an improvement over current practice. However, we strongly urge the CAISO to undertake an initiative that will be focused specifically on scarcity pricing, so that a more wholistic and consistent approach to scarcity pricing with both the CAISO and EIM regions can be developed. The experiences of mid-August again signal the urgency of such an initiative. These conditions will likely grow more frequent and the region is in need of a more coordinated approach to managing scarcity conditions.

---

<sup>1</sup> California ISO, "FERC Order No. 831 – Import Bidding and Market Parameters, Revised Draft Final Proposal," July 22, 2020, <http://www.caiso.com/InitiativeDocuments/RevisedDraftFinalProposal-FERCOrder831-ImportBidding-MarketParameters.pdf>

## II. Background

The changes proposed in this initiative are related to compliance with Order 831, issued by the Federal Energy Regulatory Commission (FERC) in 2016.<sup>2</sup> Order 831 required all Independent System Operators and Regional Transmission Organizations (ISOs/RTOs) to raise their caps on allowed energy supply offer prices from \$1000 to \$2000. Whereas most (unmitigated) offers under \$1000 are not required to be cost justified, under Order 831 offers over \$1000 will require cost justification.

The order was issued in the wake of the 2014 polar vortex when natural gas prices in the Midwest and northeast spiked to levels where marginal generation costs plausibly rose over the \$1000 offer caps then in place. The spirit of the order was to allow supply resources to earn prices at least sufficient to recover their operating costs during periods of high generation costs, thereby helping to ensure reliable electricity supply during these periods. The order did not specify exactly how the increased offer caps should interact with other aspects of price formation in ISO/RTO markets.

To understand this interaction, it is important to consider the distinction between offer caps and “price” caps (e.g., maximum prices) in ISO/RTO markets. An offer cap is the maximum price a supplier can bid into the pricing process. Under most circumstances this is *not* the maximum price a supplier may earn on the energy it does provide. US ISO markets operate under a uniform-pricing approach where all suppliers earn, and all load-serving entities (LSEs) pay, the market-clearing price. Therefore, most suppliers earn a price, set by the marginal supplier, that is above their offer price. In periods of scarcity, *all* suppliers can potentially earn a price above their offer prices.

In practice these scarcity prices are usually determined by penalty values imposed by the market software that are triggered when certain scarcity conditions arise, or equivalently, certain market constraints are relaxed. In the CAISO and EIM markets, the penalty value on the constraint balancing systemwide supply and demand, called the *power balance constraint*, is currently set at \$1000/MWh.

This CAISO initiative has primarily been concerned with two aspects of Order 831 implementation. The first is how to screen and cost justify the prices of import supply offers that are not linked to a specific supply source, and therefore cannot be cost-verified by conventional methods. The second aspect relates to if and how to raise the penalty prices in the market software and also how to set prices when the CAISO cannot balance generation and load in the energy market.

---

<sup>2</sup> Federal Energy Regulatory Commission (FERC). Order No. 831, Final Rule. November 17, 2016. <https://ferc.gov/sites/default/files/2020-06/RM16-5-000.pdf>

### III. Summary of the Proposal

The two key aspects of the proposal concern the determination of allowable offer prices and the setting of penalty values and market prices.

#### *Screening Allowable Offer Prices*

Under the CAISO proposal, offer prices linked to specific resources with known characteristics operating within the EIM footprint will be screened using the same methods currently applied for market power mitigation. These involve calculating benchmark marginal cost estimates for units based upon fuel price indices, unit efficiencies, opportunity costs, and other considerations. These costs form the basis of the default energy bid (DEB) that is applied to resources subject to local market power mitigation. Under the Order 831 compliance proposal, when the DEB of a resource rises above \$1000, the submission of offer prices at DEBs in excess of \$1000 would be allowed by the market software.<sup>3</sup> Effectively, the bids of all units with costs above \$1000 would be “mitigated” to their default energy bid (DEB), regardless of whether or not they possess local market power. There are also provisions in the proposal to allow resources to recover additional costs not reflected in their DEB, if the owners can provide evidence of these additional costs. These additional costs could therefore be recovered by the unit owner but would not set the market price.

To screen the prices of import and virtual supply offers that are not linked to a specific resource, the CAISO proposes calculating a “maximum allowed import bid price.” This is an hourly value that would be imputed from bilateral prices at regional trading hubs at Palo Verde and Mid-Columbia (Mid-C). We discuss this maximum import bid calculation in more detail below. The CAISO proposes to apply this maximum bid price differently to imports providing resource adequacy capacity (and subject to must-offer obligations) than to other non-RA imports and virtual supply.

For imports associated with RA capacity, offer prices above \$1000 would be reduced to the greater of \$1000, the CAISO calculated maximum import bid price, or the highest priced cost-justified bid. For virtual and non-RA import supply, the maximum bid price would be used as a threshold condition, rather than as a bid cap. These supply offers would be allowed up to \$2000 if *either* the CAISO calculated maximum import bid price or a cost-verified offer from any specific resource (internal or external) rises above \$1000.<sup>4</sup>

Unlike resource specific offers, offers from non-resource specific imports would *not* be eligible for after the fact cost recovery. Non-RA imports would have more flexibility to bid up to \$2000, and RA imports would be assumed to incorporate any risks created by these rules into their costs of selling RA.

---

<sup>3</sup> *Revised Draft Final Proposal*, op. cit., p. 14.

<sup>4</sup> *Revised Draft Final Proposal*, op. cit., p. 21. While this version describes RA bids being reduced to the higher of \$1000 or the maximum import bid price, it is our understanding that the CAISO intends to modify this to also include the highest price cost-justified offer in the tariff language it is developing.

## *Setting of Penalty Values and Market Prices*

A second important element of the proposal changes the penalty parameters that are applied in the market software when a constraint needs to be relaxed to reach a solution.<sup>5</sup> While not strictly price caps per se, these penalty parameters can play a similar role in that they determine market prices during intervals when supply and demand do not balance and neither supply offers or demand bids set prices. The primary focus in the proposal is on the penalty associated with the power balance constraint (PBC), which captures the requirement in the market software that energy supply must equal energy demand.<sup>6</sup> Other parameters, such as those associated with relaxing transmission constraints would also be scaled proportionately to the scaling of the PBC penalty value.<sup>7</sup> These penalty parameters are in place to ensure that constraints are relaxed only under extreme conditions and that market prices at least partially reflect the scarcity value associated with the constraint that is relaxed. Conceptually, the scarcity value is the benefit – in terms of reduced cost or increased reliability – of having enough additional capacity to *not* have to relax the constraint.

From a mathematical and economic standpoint, it makes little sense to deploy a PBC penalty parameter that is lower than the maximum allowable bid price. If this were the case, the market software would choose to relax the PBC constraint and incur a penalty rather than tap a resource whose bid costs are higher than the penalty. Therefore, for the proposed changes to allowed offer prices to be meaningful, the penalty prices will need to be at least as high as the highest possible bid. Initially, the CAISO proposed doubling all penalty values, which would have increased the penalty value associated with the PBC and most transmission constraints from \$1000 to \$2000, under all conditions.<sup>8</sup>

In comments, the CAISO DMM pointed out that doubling penalty prices in all hours was not technically required to accommodate higher bid caps.<sup>9</sup> Other stakeholders, particularly a group

---

<sup>5</sup> There are two sets of penalty values, but only those used in what is known as the pricing run are used to set prices. In the CAISO and the EIM market allocations are first determined in a scheduling run that utilizes much larger penalty values than the subsequent pricing run. The pricing run uses the quantities from the scheduling run to adjust formulations of the constraints in such a way that the final (pricing run) penalty values, or in some cases offers, set prices. The proposal discussed here would proportionally increase penalty values in both the scheduling and the pricing run.

<sup>6</sup> Note that, while relaxation of the PBC is a signal of extreme scarcity, doing so does *not* necessarily imply a need to involuntarily curtail load. Rather relaxation of the PBC signals that the offered supply that is committed (or available to be committed) into the market is not capable of meeting expected demand at the time the market solution is calculated. Operators would draw down energy from regulation and ancillary services and deploy other out-of-market actions before resorting to load curtailment.

<sup>7</sup> Appendix A. *Revised Draft Final Proposal*, p. 31.

<sup>8</sup> California ISO. Draft Tarrif Language – Commitment Cost and Default Energy Bid Enhancements. May, 2019. <http://www.caiso.com/InitiativeDocuments/CommitmentCost-DefaultEnergyBidEnhancements-DraftTariffLanguage.docx>. See discussion of “Hard Energy Bid Cap” pp. 82.

<sup>9</sup> California ISO Department of Market Monitoring. Comments on FERC Order 831 -Import Bidding and Market Parameters: Issue Paper and Straw Proposal. December 20, 2019.

of EIM entities, objected to the blanket increase of penalty values at all times in response to an initiative whose focus is on a bid-cap policy that will likely be rarely triggered.<sup>10</sup> These comments also stressed a need for more graduated scarcity prices. In response the CAISO has iterated through several design options before producing the current proposal. The current proposal would leave the PBC (and associated) penalties at their current levels (\$1000 for the PBC penalty) under normal conditions. The penalty parameters would double only when an approved offer price (after the screening procedure described above) rises above \$1000.

Under these conditions, the scheduling-run calculation of market outcomes would be based upon doubled penalty values. However, the \$2000 PBC penalty would not necessarily be used to set the energy prices used for settlements. If an offer price rises above \$1000, one of two outcomes for the setting of market prices could result, depending upon the magnitude of the constraint violation. The CAISO now proposes that if the PBC is violated by only a small amount – currently 233.7 MW in the CAISO system – then the systemwide marginal energy cost (SMEC) would be capped at the highest energy price bid to pass the screens described above.<sup>11</sup> In other words, systemwide energy prices would be capped at the highest approved offer price for “small” PBC violations. The MW size of the threshold for EIM balancing areas will be based upon a formula considering NERC standards for managing area control error (ACE) magnitudes.<sup>12</sup> Locational marginal prices (LMP) could still rise above these levels as other elements of an LMP, notably the marginal costs of transmission congestion and losses at a given node, would be added to the systemwide energy cost.

If screened offer prices rise above \$1000 *and* there is a PBC constraint violation of a large magnitude (e.g. in excess of the thresholds described above), then prices would be set, as is normal procedure, according to the PBC and associated penalty values which would be doubled from their “normal” levels under these circumstances. Under these conditions the systemwide energy component of prices could be set at \$2000 even if the highest energy bid is less than \$2000. Although the most recent proposal implies this threshold would be applied in both the day-ahead and real-time markets, it is now our understanding that it will only be applied in real-time. In the DAM, a PBC relaxation of any magnitude will set prices at the \$2000 penalty price, if any of the conditions allowing offer prices above \$1000 apply.

---

<http://www.caiso.com/InitiativeDocuments/DMMComments-FERCOrder831-ImportBidding-MarketParameters-RevisedStrawProposal.pdf>

<sup>10</sup> Joint Party Comments. Commitment Costs and Default Energy Bid Draft Tariff Language. May 28, 2019. <http://www.caiso.com/InitiativeDocuments/JointPartiesComments-CommitmentCostsandDefaultEnergyBidEnhancements-DraftTariffLanguage.pdf>

<sup>11</sup> California ISO, “FERC Order No. 831 – Import Bidding and Market Parameters, Final Proposal,” August 24, 2020, pp. 17. <http://www.caiso.com/InitiativeDocuments/FinalProposal-FERCOrder831-ImportBidding-MarketParameters.pdf>.

<sup>12</sup> *Final Proposal*, op. cit., p. 15-16.

## IV. Discussion

Given recent history, the conditions under this proposal would be applicable are likely to be very rare, but are not unimaginable. In 2018 and 2019 there were no more than 3 days in which the maximum import bid price had the potential to exceed \$1000. However, as the experience with the mid-August heat wave has shown, there are reasons to believe that prices in both the natural gas and electricity markets will become more volatile in future years and power markets need to be prepared to accommodate conditions when the marginal costs of generation could rise above \$1000. The CAISO is required by FERC order to do so.

Two areas where the CAISO had some discretion in implementing Order 831 were the specific methodology used to screen generation and import offers, and how to modify the price-setting process, including penalty values, if generation costs did rise above the default offer cap of \$1000. We support the CAISO's general approach but in the following sections discuss some potential areas for further refinement.

### *Screening Allowable Offer Prices*

For the bulk of supply offers into the market, the CAISO will apply the same methods to screening offers as it utilizes to evaluate potential market power in energy price offers. These methods underwent important updates in 2018 with the changes implemented under the Commitment Costs and Default Energy Bid Enhancements (CCDEBE) initiative. Changes were made to improve the timeliness of gas price data used in the calculation of DEBS, and major changes were made to the calculation of opportunity costs used in the offers of hydro generation sources. While there are still significant challenges to calculating accurate DEBs, particularly in times of volatile gas prices,<sup>13</sup> it is logical and internally consistent that the proposal would adopt an approach to the verification of cost consistent with that used for various other purposes in the CAISO and EIM.

### *Import Supply Offers*

For import supply offers not linked to specific units, the CAISO will deploy an index based upon the higher price at two regional over-the-counter (OTC) trading hubs. These OTC contracts, which are traded on the Intercontinental Exchange (ICE), are typically traded in a liquid market and their prices are representative of regional market prices for blocks of hours during the trading period. However, these contracts clear only in off-peak or on-peak multi-hour blocks. In order to transform a 16-hour (in the case of peak contracts) average price into an allowable hourly import bid, the CAISO will apply a "shaping factor." Earlier proposals first considered using the average price profile for the month, and then the price profile based upon the previous day's CAISO day-ahead market SMEC price. This proposal was then modified to instead use the profile based upon the most recent day in which there was at least one hour with a SMEC

---

<sup>13</sup> J. Bushnell, S. Harvey, and B. Hobbs, "Opinion on Commitment Costs and Default Energy Bid Enhancements (CCDEBE)." March 5, 2018. [http://www.caiso.com/Documents/MSCFinalOpinion-CommitmentCost\\_DefaultEnergyBidEnhancements-Mar5\\_2018.pdf](http://www.caiso.com/Documents/MSCFinalOpinion-CommitmentCost_DefaultEnergyBidEnhancements-Mar5_2018.pdf)

over \$200/MWh in the CAISO day-ahead market.<sup>14</sup> This “reference day” will be adjusted seasonally, so that if there is no high price day in the current season of the current year, the index would be based upon the most recent high price day from the same season from a previous year.<sup>15</sup>

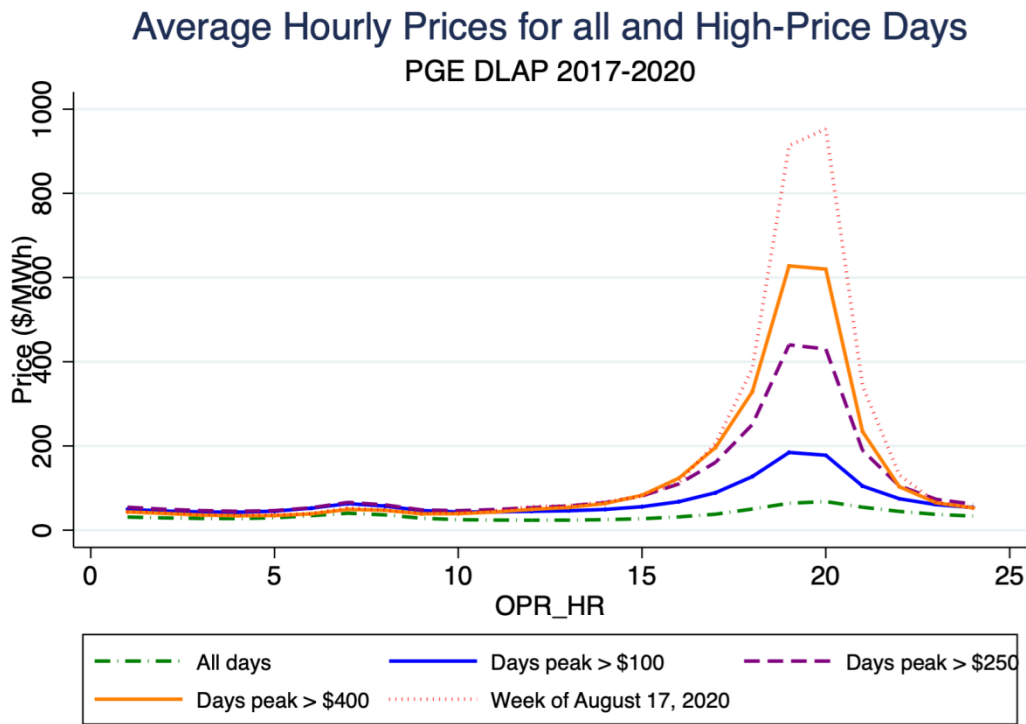


Figure 1: Average Price Differences with Previous Day

The main reason for this recent change is that, while under most conditions the previous day’s price pattern is very similar to that of the current day, this relationship can break down during high price events. The difficulty is illustrated in Figure 1, which plots average hourly DAM prices from the PG&E DLAP zone during all hours and during hours in which peak prices reach various thresholds. The higher the peak price in CAISO, the larger the disparity between those peak prices and the average daily price.

While not perfect, using prices from the previous high-priced day rather than from the month as a whole to calculate the shaping factor is an improvement over previous proposals and less likely to materially understate or overstate the level of hourly prices. However, as currently configured, during the beginning of a period of very high price events the index could very likely understate the true extremity of prices, relative to the daily average, in evening ramp hours 18-

<sup>14</sup> Specifically, for peak hours, the ratio would take the difference between the SMEC price is hour X and the average of all SMEC peak prices divided by the average of all SMEC peak prices. For example, if the hour 18 price were 150 and the average peak price were 100, the ratio would then be  $(150-100)/100$  or .5. This value would be added to 1 and multiplied by the 16 hour ICE hub price to calculate an index price for that hour.

<sup>15</sup> *Final Proposal*, op. cit., p. 27. August 24, 2020.

22, which are the hours in which gas fired generation or imports are likely to be on the margin and the index would be most relevant. This is therefore a somewhat conservative formula for capping the prices at which import supply would be accepted in those hours. An alternative would be to use some additional observable characteristics, such as weather or even the daily average price, to better “match” a given day’s price pattern to those of previous days. While it would be important for the CAISO continue to investigate the feasibility of fine tuning this calculation if this price index had a general applicability to capping import prices during high gas price periods, the CAISO currently proposes to use this index only in very limited circumstances.

The experiences from the recent mid-August heat wave are instructive. The DAM SMEC exceeded \$1000 for at least one hour on August 17<sup>th</sup>, 18<sup>th</sup> and 19<sup>th</sup>, and approached \$1000 on August 14<sup>th</sup> and 15<sup>th</sup>. The 16-hour peak block ICE price at the PV hub rose from about \$175 on the 14<sup>th</sup> to \$1400 on the 18<sup>th</sup>. The relationship between the hour 19 price and the on-peak average price in the CAISO DAM also grew more extreme. The August 15<sup>th</sup> shaping factor for hour 20 based upon the August 14<sup>th</sup> DAM would have been just under 4, whereas the shaping factor for hour 20 based upon the August 18<sup>th</sup> DAM would have been just under 12. This experience implies that (a) the shaping factors can be quite volatile even within this set of high-priced days, and (b) the market in the most severely constrained days and hours would have allowed bids above \$1000 and potentially allowed \$2000 scarcity prices. We believe that certainly would have been appropriate and most likely beneficial to the CAISO’s reliability situation on these days. The index may not have allowed higher bids on August 14<sup>th</sup> and 15<sup>th</sup>, days that did not see \$1000 SMEC prices but did come close in several hours. That raises a note of caution that this index and the shaping factors applied to it will not be ideal under all circumstances.

For some supply offers, the maximum import price would be applied as a blunt threshold screen rather than as a precise cap on offer prices, but it would only be applied to a subset of import supply. Import supply procured via resource adequacy contracts would be limited to the higher of the highest verified bid or the maximum import bid price as described above. However, under the proposal, non-RA import supply and virtual supply offers would be allowed up to \$2000 if either the DEB for a specified resource (internal or external) or the maximum import price calculation described above rises above \$1000. One implication of this policy is that a mismeasurement of the “true” import costs during peak hours would only discourage import offers if it resulted in a maximum import price falling falsely below \$1000. If the calculated hourly price rises above \$1000, bids from non-RA imports would be allowed up to \$2000.

### *Setting of Penalty Parameters*

The other main area of focus in the proposal is the determination of when and how to raise penalty prices. An early proposal by the CAISO would have doubled all penalty prices under all conditions. We supported this proposal because we believe there is a growing need to refine and improve scarcity pricing in the CAISO and EIM markets. There is a large growing role for alternative resources - ranging from variable energy renewable sources to battery and other storage resources to demand response – in California and the west in general. The proper utilization of these resources depends upon being able to calculate and deploy these resources during hours in which their value is determined by scarcity, rather than by conventional fuel



costs. This is true regardless of the role that resource adequacy and regulatory policies play in investment. In addition, we have repeatedly stressed the role of short-term pricing in providing proper value to flexible resources of all types. All these things depend upon significant scarcity prices that would ideally be based upon the reliability and consumer benefits of supply.

That said, we also recognize that offer prices, not penalty or scarcity pricing, are the subject of FERC Order 831. Therefore, while some changes to penalty pricing need to be made in order for the offer price changes to be accommodated, it is also reasonable to reserve consideration of more general changes to penalty parameters for an initiative that is dedicated to the subject of scarcity pricing in the CAISO and EIM.

Note that while bid caps and penalty values are related mechanically in the pricing software, the economic issues are fairly distinct. The “cost” of scarcity is ultimately based upon the economic costs of interruptions and grid instability. These costs do not move in lockstep with the marginal costs of generators, but rather with the stability of the grid and the values consumers place upon reliable service. Current methods in fact *reduce* the value of scarcity to suppliers when marginal generation costs rise. The penalty values are fixed so the gap between the marginal cost and penalty value declines when marginal costs rise. In the extreme, setting prices at the highest approved offer price guarantees there are *no* scarcity rents earned by suppliers.

While we agree that this is not the proper initiative in which to determine scarcity pricing policy, and that it is complicated to determine what a “just and reasonable” scarcity value is, we note that capping prices at the last accepted bid effectively sets the scarcity value to zero. We believe this is unreasonable unless there is indeed no actual scarcity. Further, as we discuss below, there are different ways to define “scarcity” and there are good reasons to apply scarcity prices before needing to resort to leaning or involuntary load shedding. The distinction is between a scarcity of supply that restricts continuing of normal operations and a more severe scarcity that risks systemwide failures.

Some stakeholders have argued that scarcity pricing should be treated differently in the EIM markets operating outside of the CAISO system. Among the reasons put forward for this are the fact that i) EIM only transacts energy and does not dispatch ancillary services, ii) EIM entities maintain all their responsibilities as balancing area authorities (BAAs), iii) EIM is a voluntary market.<sup>16</sup> The general point of these arguments is that scarcity in the EIM market within an area does not equate to a reserve deficiency, area control error (ACE) violation, or any other reliability-based operating standard enforced by NERC. These are arguments that raise fundamental questions about the role of scarcity pricing that are somewhat distinct from the question of what the appropriate level of a scarcity price should be. We discuss these below.

---

<sup>16</sup> “Comments of Select EIM Entities.” FERC Order No. 831 – Import Bidding and Market Parameters Draft Final Proposal, August 12, 2020. <http://www.aiso.com/InitiativeDocuments/EIMEntitiesJointComments-FERCOrder831-ImportBidding-MarketParameters-RevisedDraftFinalProposal.pdf>. See also “POU EIM Entities Comments.” FERC Order No. 831 – Import Bidding and Market Parameters Draft Final Proposal, August 13, 2020. “<http://www.aiso.com/InitiativeDocuments/POUEIMEntitiesComments-FERCOrder831-ImportBidding-MarketParameters-RevisedDraftFinalProposal.pdf>”

First, as we have discussed above, a PBC violation does *not necessarily* imply a violation of NERC operating standards. It reflects that fact that available committed energy supply is insufficient to meet expected demand. The CAISO market software enforces ancillary service constraints as strictly as the PBC and unless the CAISO is in a state of emergency does not allow for a drawing down of AS based energy before triggering a PBC constraint violation.<sup>17</sup> Therefore, all CAISO markets, including EIM, price energy distinctly from ancillary services and “scarcity” in the energy market is exactly that, a signal that bid-in *energy* supply is insufficient to meet *energy* demand. The fact that EIM entities maintain their AS operations separately from the EIM is therefore consistent with the price-formation approach in the CAISO’s software inside and outside of the CAISO control area.

Second, the fact that participation in the EIM market is voluntary does not mean that maintaining resource sufficiency beyond day-ahead scheduling is voluntary. Scarcity pricing will only impact load serving entities that have not procured (or supplied) enough generation in the EIM to meet their load. Before relaxing the PBC in the EIM, the EIM software will draw upon all available resources from all connected EIM regions to try to prevent that violation. If the PBC constraint is violated and the scarcity penalties are set too low, this could be viewed as a form of “leaning” via the EIM because it results in drawing supply from other regions at prices limited by the penalty parameter. It is not “free-riding” on neighboring regions, but it is arguably “under-priced riding,” particularly during periods of regional electricity scarcity or high gas prices.

The conditions of August 18, 2020 illustrate the types of incentive problems that can be created in EIM regions if scarcity prices are set too low. The 16 hour block on-peak ICE contract at Palo Verde traded at slightly over \$1400 on Tuesday August 18, implying that energy was valued at least at that level, and mostly likely higher, for many of the peak hours of that day. Because the PBC penalty value remains at \$1000 pending the resolution of this initiative, LSEs faced an opportunity to sell energy at prices well above \$1000 from generation not participating in EIM, while facing a more limited penalty from any prospective imbalance within the EIM itself.

The self-sufficiency test is intended to prevent this kind of leaning on the EIM but this “pseudo-leaning” is nevertheless occurring during some power balance violations. The possibility that a balancing area might have additional resources that it did not make available to the dispatch that could have avoided the need to lean on other EIM participants would make it more egregious that the load serving entity is leaning on other participants in this manner, not less. And this leaning could be even more egregious during gas shortage conditions – the kind of conditions where these penalty values would be triggered - when holding back resources from the EIM dispatch might enable one EIM entity to conserve gas supplies by effectively leaning on the gas supplies of other EIM entities.

There is certainly a legitimate argument that the scarcity implied by a PBC violation may occur too frequently under current market operations due to the continuing dysfunction of the flexi-

---

<sup>17</sup> It is our understanding that in the real-time pre-dispatch (RTPD) all ancillary services are protected with a high penalty value. Within the real-time dispatch (RTD) intervals, non-contingent spin and non-spin can be dispatched to provide energy but regulation is protected at a hard limit.

ramp product which does not procure enough ramp in the right locations to avoid these PBC violations. Nevertheless, the violations are occurring. We agree that a graduated increase in the scarcity price would be an improvement over the current approach, but such a graduated increase only implies that prices would be higher when ramp is tight but there is no PBC violation, it would not lower prices when there is a PBC violation. We see these questions as about improving the *implementation* of scarcity pricing whereas some of the arguments put forward by the EIM entities seemed to question whether *any* scarcity pricing was appropriate in the EIM. We believe that scarcity pricing is not only important but also critical for efficiently managing tight supply conditions and for the efficient integration of unconventional resources such as renewable generation, storage assets, and demand response into the western grid.

As we note in our related opinion on modifications to the flexiramp product,<sup>18</sup> if flexiramp were working as intended, it would result in a form of graduated scarcity. Prices should rise as the system becomes short on ramp capacity leading to a more gradual step-up to the PBC constraint penalty. However, flaws in the flexiramp design have instead produced ramp prices that are zero even during periods of PBC violations. The proposed changes evaluating the deliverability of flexiramp should help, but it is hard to know at this stage how much of these problems will be resolved by the deliverability change.

For the CAISO system, the debate over the appropriate penalty value for PBC violations may become moot given the ability of firms to bid up to \$2000 for non-RA import and virtual supply. It is quite possible firms could maintain offers at this level and under the current proposal the market software would accept energy from these sources before allowing a PBC violation. In this sense the current proposal encourages offers at this level during high price periods given the possibility that a small violation would produce a lower SMEC price.

## V. Summary and Conclusions

The current proposal represents a modest first step toward a more comprehensive reform of scarcity pricing. It establishes a range of “modest” scarcity, within which scarcity would be considered incidental. For these “small” scarcity outcomes, SMEC prices would be based upon the highest approved offer price.<sup>19</sup> If the PBC relaxation is “large” – currently proposed to be based upon operational standards that imply a threshold of 233.7 MW in the CAISO – then SMEC prices would be set at the penalty value of \$2000.

We support the general framework of stepping-up penalty prices in relation to the severity of the constraint violation. This is consistent with the practice of other ISOs that dispatch capacity needed to meet reserve or regulation requirements to balance load and generation at increasingly higher prices as the resulting shortfall in regulation or reserves rises. It is also consistent with the intuition that the “costs” of a violation, as captured in increased risk to the system, increase

---

<sup>18</sup>J. Bushnell, S.M. Harvey, and B.F. Hobbs, "Opinion on Flexible Ramping Product Refinements", Draft of Sept. 2, 2020, [http://www.caiso.com/Documents/MSO-OpiniononFlexibleRampingProductEnhancements-Sep8\\_2020.pdf](http://www.caiso.com/Documents/MSO-OpiniononFlexibleRampingProductEnhancements-Sep8_2020.pdf)

<sup>19</sup> Again, individual LMPs could rise well above this level, and above even \$2000 when congestion costs, losses and other components are included.

continuously with the severity of the violation. It is a fiction that these implicit costs would jump by potentially thousands of dollars simply by crossing a constraint threshold by 1 MW. That said, we are not in a position to judge the merits of the current threshold calculation as the appropriate threshold, either in the CAISO or elsewhere. We agree that it is almost certainly the case that the appropriate “near-scarcity bandwidth” should be scaled to the size of the balancing area in which it is applied, something that the current proposal does.<sup>20</sup>

We therefore support the provisions in this proposal for applying the DEB approach for specific generation units, and the import cost index approach for unspecified imports as the means of cost-justifying offers over \$1000. We also support the provision that non-RA import offers be allowed to rise up to \$2000 when specific or indexed offer prices rise above the \$1000 threshold. The import cost index will not be a perfect measure of the hourly cost of supply outside of CAISO, but will hopefully be representative enough of those costs to allow for the market to adjust during extreme high gas cost periods or during periods of scarcity such as those experienced in mid-August. If California has adequately procured sufficient resources, it would not need rely upon those no-RA imports. If, however the CAISO is indeed experiencing scarcity despite the RA policies in place, the flexibility to offer up to \$2000 is greatly preferably to involuntary load shedding.

We also support the penalty pricing aspects of this proposal, as a reasonable measure for Order 831 compliance. We also believe this process has led to discussions that will hopefully result in developing a better approach to scarcity pricing. We strongly recommend the CAISO consider a stakeholder process devoted to scarcity pricing both in real-time and its role within a potentially expanded day-ahead market. The experiences of mid-August have revealed that periodic scarcity is a real prospect in the CAISO and the entire western system and there should be a strong push to reach some consensus on the appropriate way to price and manage scarcity in both the CAISO and the EIM.

---

<sup>20</sup> California ISO, “FERC Order No. 831 – Import Bidding and Market Parameters, Final Proposal,” August 24, 2020, page 17, <http://www.caiso.com/InitiativeDocuments/RevisedDraftFinalProposal-FERCOrder831-ImportBidding-MarketParameters.pdf>