

Memorandum**To:** ISO Board of Governors**From:** Benjamin F. Hobbs, Chair, ISO Market Surveillance Committee**Date:** March 16, 2018**Re:** **Briefing on MSC activities from Dec. 2, 2017 to March 15, 2018**

This memorandum does not require Board action.

During the period covered by this memorandum, the Market Surveillance Committee (MSC) consulted with ISO staff on several initiatives. In addition, MSC members drafted an Opinion on the commitment costs and default energy bid enhancement initiative, which the MSC adopted at a general session teleconference meeting on March 5, 2018, and drafted an Opinion on the congestion revenue rights track 1 proposal, which was adopted during a general session teleconference meeting on March 15, 2018. Dr. Ben Hobbs, Chair of the MSC, summarized the Opinion on the commitment costs and default energy bid enhancement initiative in a presentation to the Energy Imbalance Market Governing Body on March 8, 2018.

Finally, the MSC held a general session meeting on February 2, 2018. During that meeting, there were presentations and discussions on the congestion revenue rights initiatives, as well as three other topics: the California ISO transmission access charge initiative, the flexible resource adequacy and must offer obligation (Phase 2), and the performance of the flexible ramping product.

The two Opinions are summarized below, followed by a description of the presentations and discussions at the general session meeting.

Opinion on Commitment Costs and Default Energy Bid Enhancements

There is a potential for the exercise of market power in the ISO market through inflated commitment cost offers, which can inflate energy prices, bid-cost recovery by committed generators for whom prices do not cover their as-bid costs, and exceptional dispatch payments. The ISO's present commitment cost mitigation approach relies upon an assumption that the ISO can estimate the true operating costs of most or all resources with reasonable accuracy. But this assumption about the visibility of operating costs is becoming less reliability as natural gas prices have become more volatile, and as the ISO market has expanded to regions in which not all gas-fired generation is located at liquid trading points for gas with published indexes and may in the future include more unconventional generation.

The ISO has therefore proposed a comprehensive reform of its rules considering commitment cost offers and how the ISO mitigates potential market power in those offers

which is called the commitment costs and default energy bid enhancements.¹ The MSC has participated extensively in the development process for this initiative, including discussions addressing principles and detailed implementation issues that have taken place at several MSC public meetings over the past two years.² Moreover, this is not the first time that the MSC has considered the issues involved in designing a commitment cost bidding system that is both cost-reflective and safe from the exercise of market power. In over 10 Opinions that the MSC has adopted since 2007,³ the MSC has considered market power mitigation for commitment costs. It has repeatedly recommended the adoption of dynamic market power tests that would give resources without market power more flexibility to bid their costs during periods while protecting consumers against the exercise of market power in those location. The MSC has also strongly encouraged the ISO to estimate and include all relevant costs in

¹ California ISO, Commitment Cost and Default Energy Bid Enhancements, Revised Draft Final Proposal, January 31, 2018, www.caiso.com/Documents/RevisedDraftFinalProposal-CommitmentCosts-DefaultEnergyBidEnhancements.pdf

² Presentations and discussions on CCDEBE occurred in MSC meetings held June 17 and Nov. 18, 2016; and May 5, July 10, Sept. 8, and Dec. 1, 2017.

³ In reverse chronological order, these include the following opinions:

- J. Bushnell, S. Harvey and B. Hobbs, Opinion on Commitment Cost Bidding Improvements," March 10, 2016, www.caiso.com/Documents/MSC_Opinion_CommitmentCostBiddingImprovements-Mar10_2016.pdf
- J. Bushnell, S. Harvey, B. Hobbs, and S. Oren, Opinion on Reliability Services Phase 1 and Commitment Costs Enhancements Phase 2, March 23, 2015, www.caiso.com/Documents/Decision_ReliabilityServicesPhase1-MSC_Opinion-Mar2015.pdf
- J. Bushnell, S. Harvey, B. Hobbs, and S. Oren, "Opinion on LMPM Implementation in the Energy Imbalance Market," July 7, 2014, www.caiso.com/Documents/FinalOpinion-LocalMarketPowerMitigationImplementation-EnergyImbalanceMarket-July7_2014.pdf
- J. Bushnell, S. Harvey, B. Hobbs, and S. Oren, "Opinion on Commitment Cost Enhancements," Sept. 8, 2014, www.caiso.com/Documents/MSC_FinalOpinionCommitmentCostEnhancements-Sept2014.pdf
- J. Bushnell, S. Harvey, B.F. Hobbs, and S. Oren, Report on the Appropriateness of the Three Pivotal Supplier Test and Alternative Competitive Screens, June 27, 2013, www.caiso.com/Documents/Report-Appropriateness-ThreePivotalSupplierTest-AlternativeCompetitiveScreens.pdf
- J. Bushnell, S. Harvey, B.F. Hobbs, and S. Oren, "Opinion on Mitigation Measures for Bid Cost Recovery," Dec. 5, 2012, www.caiso.com/Documents/FinalOpinionBidCostRecoveryMitigationMeasures.pdf
- J. Bushnell, S. Harvey, B.F. Hobbs, and S. Oren, "Opinion on Bid Cost Recovery Mitigation Measures and Commitment Costs Refinement," May 7, 2012, www.caiso.com/Documents/MSCFinalOpinion-BidCostRecoveryMitigationMeasures_CommitmentCostsRefinement.pdf
- J. Bushnell, S. Harvey, B.F. Hobbs, "Final Opinion on Renewable Integration: Market Product Review, Phase 1," Dec. 11, 2011, www.caiso.com/Documents/MSC_Final_Opinion_RenewableIntegrationMarket-ProductReviewPhase1.pdf
- F. Wolak, J. Bushnell, B. Hobbs, "Opinion on Changes to Bidding and Mitigation of Commitment Costs", June 4, 2010, www.caiso.com/Documents/FinalOpiniononChanges-BiddingandMitigation-CommitmentCosts.pdf
- F. Wolak, J. Bushnell, B. Hobbs, "Comments on Changes to Bidding Start-Up and Minimum Load," July 9, 2009, www.caiso.com/Documents/DraftOpiniononStart-UpandMinimumLoadBiddingRules.pdf
- J. Bushnell, S. Harvey, and B. Hobbs, "Opinion on Local Market Power Mitigation and Dynamic Competitive Path Assessment," July 1, 2011, www.caiso.com/Documents/110713Decision_LocalMarketPowerMitigationEnhancements-MSC%20Opinion.pdf
- F. Wolak, J. Bushnell, B. Hobbs, "Opinion on Start-Up and Minimum Load Bid Caps Under MRTU," Aug. 2007, www.caiso.com/Documents/FinalOpiniononStart-upandMinimumLoadBidCapsUnderMRTU.pdf

operating cost estimates, including opportunity costs for starts, run hours, and energy.⁴ The MSC has also stressed in those Opinions the importance of up-to-date, relevant, and reliable fuel cost indices for the development of default energy bids.

The enhancements attempt to focus mitigation of commitment costs on a subset of units deemed to possess local market power using a dynamic test, and to allow more flexibility for market offers of these costs to other units. The implementation of this approach is more complicated with commitment costs than it is with energy bids because of the lumpy nature of commitment costs. The MSC agrees that this is an important and necessary initiative to undertake. In brief, the MSC agrees that the volatility of gas prices and the need to encourage resources to make flexible offers into the market mean that it is desirable that the ISO implement a more flexible system that allows resources to offer commitment costs that better reflect recent and anticipated costs particularly during periods of gas price volatility, and mitigate market power at those times that there is a significant risk of its exercise. The MSC believes the proposal will also enable the ISO to coordinate a more efficient market across the broader EIM region and better accommodate the diverse gas supply situations of utility generation across the west. Therefore, the MSC recommended that the ISO move forward with the development, testing and implementation of its design for dynamic mitigation of commitment costs as proposed.

The MSC noted that this is a very complex proposal with many features that stakeholders have commented extensively on. The MSC did not express views on every issue raised in the Opinion. Instead, the MSC focused on evaluating whether the proposal addresses the major problems with the current design. The MSC also did not discuss other possible designs, such as a conduct-and-impact paradigm that might have some advantages but would entail much larger changes relative to the current design. Such more radical reforms of the commitment cost bidding and mitigation system might be worth considering in the future should the proposed reforms turn out to be less effective than intended in adding flexibility while protecting against the exercise of market power.

The Opinion makes some detailed recommendations. Two concerned alternative implementations that may have some advantages, and should be considered if computational performance of the market software or the frequency of “false positives” becomes an issue. One is to combine market power tests on binding non-competitive constraints for energy and commitment cost offers; this would be more efficient computationally, and could reduce false positives. The second is to use after-the-fact mitigation of commitment cost offers if a resource that is not committed in the market power run also does not impact binding noncompetitive constraints, but would significantly affect nonbinding critical constraints.

Additional conclusions in the Opinion included the following: **(1)** Overall, the MSC supported the transition to commitment cost reference levels that can be based on negotiated values or supplier updated cost information, consistent with the changes that have been introduced in the overall market power mitigation design of other ISOs over the past 5-7 years. **(2)** With the greater ability of suppliers to reflect their actual costs in reference prices,

⁴ Opportunity costs are being implemented under the commitment costs enhancements phase 3 initiative, adopted by the Board of Governors on March 25, 2016, www.caiso.com/informed/Pages/StakeholderProcesses/CommitmentCostEnhancements.aspx

the proposed reduction in the general mitigation threshold for commitment costs from 125% to the same 110% is appropriate. **(3)** The MSC continues its support of efforts by the ISO and its Department of Market Monitoring (DMM) to base offer price mitigation on updated gas price information when available and sufficiently reliable. **(4)** The MSC supports the proposal that the default caps on commitment cost offers automatically would rise from 150% to 300% of the cost estimated by the ISO after 18 months unless the ISO files with FERC to defer this increase. The MSC supports this design as it allows the ISO to defer the change in caps if market issues are identified during the first 12 months that provide reason for delay. The alternative of requiring a new stakeholder process before implementing the second increase would delay the increase in the cap regardless of whether there are any performance issues warranting such a delay.

In addition, individual MSC members have made an additional suggestion which is not in the Opinion itself. One is a concern shared with the Department of Market Monitoring that committed resources could game later minimum load bids. This behavior could be quickly identified by the ISO, but at least one member thought that it would be preferable that this kind of situation be addressed in rules for after-the-fact mitigation of commitment cost offers if market power would inflate bid cost recovery. ISO staff have indicated that such after-the-fact mitigation would make the settlement process more complicated, which is an important consideration to be balanced against any benefits of an after-the-fact process.

In the Opinion, the MSC first reviewed past market issues that motivated previous revisions of the ISO procedures for making and mitigating commitment cost offers, and recent developments that have led the ISO to revisit those procedures. Recommendations of previous MSC opinions on commitment cost costs and mitigation were also summarized; the principles underlying the CCDEBE proposal are broadly consistent with those recommendations. Then in Section 3, the MSC summarized the ISO's general goals in designing this initiative. Finally, in Sections 4-6, the MSC discussed issues associated with three core elements of the CCDEBE proposal:

- market-based offers for commitment costs (Section 4),
- dynamic mitigation of commitment cost offers (Section 5), and
- revised definition procedures for reference prices (Section 6).

Opinion on Congestion Revenue Rights Auctions

ISO has proposed major revisions to its process for auctioning Congestion Revenue Rights (CRRs) preceding its auction of annual CRRs to be held in July 2018.⁵ The proposal follows a year-long exploration of several concerns with the California CRR system as it is currently constructed. The ISO and its Department of Market Monitoring (DMM) have highlighted, in particular, the fact that CRRs have, on average, sold at auction prices substantially below the value of the revenue streams associated with them. From 2009 through 2017, payouts to

⁵ California ISO, Congestion Revenue Rights Auction Efficiency, track 1 Draft Final Proposal, February 8, 2018, www.caiso.com/Documents/DraftFinalProposal-CongestionRevenueRightsAuctionEfficiency-Track1.pdf; California ISO, Congestion Revenue Rights Auction Efficiency, track 1 Draft Final Proposal Addendum, March 8, 2018, www.caiso.com/Documents/DraftFinalProposalAddendum-CongestionRevenueRightsAuctionEfficiency-Track1.pdf.

auctioned CRRs have exceeded \$1.4 billion while auction revenues for those CRRs was just over \$740 million, a difference of close to \$700 million. This “auction revenue shortfall” has been declining over time. The ISO report similarly calculates that the payout to annual CRRs exceeded their auction price by \$48 million over the period January 2015 through May 2017, while the payout to monthly CRRs exceeded their auction price by about \$92 million over the same period.

The DMM and some load-serving entities, who are the residual claimants on congestion revenues if they were not sold at auction, have characterized the auctions as unwilling sales of future revenue streams that are fated to be sold below value due to fundamental flaws in the CRR process. At the same time, CRRs have long been held to be useful, if not critical, instruments for hedging the risk of congestion prices in transmission networks. The development of the paradigm of financial transmission rights (or CRRs) was a fundamental step in shifting US power markets away from inefficient physical transmission rights as a means of providing open access to transmission systems.

If significant value is placed upon CRRs as a hedging tool, especially by parties who do not receive allocated CRRs, then market design changes that eliminate or substantially reduce access to them raise potential concerns about market efficiency and competitiveness. The ISO track 1 proposal attempts to balance these concerns with those of DMM and the investor-owned utilities who have argued that CRRs sales are costing their ratepayers an average of about \$75 million per year, although this number is lower in recent years. In addition to changes in outage reporting and other process changes, the proposal would restrict the types of CRRs available for auction by limiting the sources and sinks of the CRRs that would be eligible for sale in the auction.

The MSC been asked by the ISO to provide an Opinion on the track 1 proposal. The causes of shortfalls in the ISO’s CRR auctions along with possible remedies have been previous discussed at two MSC meetings. These include meetings on Feb. 3, 2017, when the MSC discussed possible analyses to understand the reasons for the revenue shortfalls and to quantify the uses of auctioned CRRs for hedging and trading purposes;⁶ and Feb. 2, 2018, when the ISO’s track 1 proposal (the present proposal) was first publicly discussed. The MSC has also written opinions previously on CRR auction and allocation as a part of the MRTU design process.

At this stage, there are three broad policy directions that the ISO could take:

- 1) Continue the status quo with only minor modifications to the auction,
- 2) Eliminate the auction in its current form, leaving it as only a trading platform for “voluntary” transactions (as in the DMM proposal), or
- 3) Make substantial revisions to the auction structure that try to maintain its hedging benefits while significantly reducing losses to transmission ratepayers. These revisions could either be intended to be permanent, or could instead be provisional, intended to reduce losses while the ISO further analyzes possible changes and

⁶ S. Harvey, Briefing on Analyzing Congestion Revenue Rights Auction Valuation, MSC Meeting, February 3, 2017, www.caiso.com/Documents/BriefingonAnalyzingCongestionRevenueRightsAuctionValuation-MSCHarvey-Feb2017.pdf

develops a more finely tuned proposal that may include further restrictions on auction sales in some respects, but allow more auction participation in other respects.

The ISO proposal falls in the third category. The changes to the auction are far more than minor adjustments. However, they preserve the ability of non-load serving entities to directly access the ISO-backed CRR market in order to hedge sales to load serving entities at load aggregation points or trading hubs by purchasing CRRs sourcing at generators or the ties and sinking at load aggregation points and trading hubs. They also maintain some of the other flexibility attributes provided by the current auction process, such as exporting, wheeling, and even non-contracted merchant generation. The changes can also be viewed as provisional, and could be supplanted or supplemented by changes as part of track 2 of the CRR auction reforms or subsequent proposals. The MSC supports this proposal for the detailed reasons provided in the Opinion, which are summarized below.

At this time, the MSC does not support the DMM proposal for reasons detailed in the Opinion. In particular, it would be counter to the open access principles that motivated the creation of congestion revenue rights as a hedge in the first place; replacement hedges would likely be available only at a much higher prices for market participants who do not participate in the free allocation stage of CRR allocation; and caution should be the rule when considering market changes that would profoundly affect the availability and cost of transmission hedging services. If the track 1 and 2 changes proposed by the ISO prove to be ineffectual in reducing CRR auction losses, then the DMM proposal is one alternative that could be considered.

The auction, as it is currently implemented, has produced a revenue shortfall that has ranged from 50 – 75 \$million over the last three years. Total congestion revenues during this period have been several times as large. At the same time, CRRs are viewed by many, including ourselves, as providing benefits to the operation and efficiency of wholesale markets. While it is extremely difficult to quantify the exact contribution that auctioned CRRs provide to the market, it does not have to be substantial to make a difference. The total wholesale cost of serving load, as calculated by DMM, ranged from 7.5 to 12.1 \$billion annually between 2014 and 2016. The ISO's CRR auctions need to contribute less than one percent to wholesale market efficiency to offset the entire auction revenue shortfall, thereby actually producing a net benefit to ratepayers, and would be able to provide a larger net benefit when the auction revenue shortfall is reduced by the ISO Tracks 1 and 2 proposals.

While it is extremely difficult to quantify the impacts of the changes proposed by the ISO in track 1, they are qualitatively consistent with the goal of preserving access to congestion hedging instruments for all load serving entities, including the smaller load serving entities that appear to be more likely to purchase power at trading hubs, while minimizing ratepayer losses. Most plausible hedging transactions require rights consistent with the physical flow of power or with financial supply deliverability at trading hubs, and those instruments will be preserved under the proposal. While it is possible that other types of CRRs play some role in supporting hedging, as well as speculation, the MSC knows of no reliable way to quantify the contributions these types of CRRs make to the hedging function. The ISO auction analysis does show us, however, that these rights have been responsible for the largest net revenue shortfalls over the last several years.

While the proposal is qualitatively a step in the right direction, the exact quantitative impacts are uncertain. It is unclear to us how effective the source-sink restrictions will be in limiting the sale of CRRs that have little value as hedges and are sold in the auction at low prices relative to the expected payout. By how much the source-sink restrictions will improve the balance between auction prices and CRR payouts is uncertain. Nevertheless, the MSC believes that these changes are likely to reduce the auction revenue shortfall without substantially harming market efficiency, and the ISO can undertake additional analysis to guide additional changes over the coming weeks. While the annual auctions for 2019 will begin this summer, the largest differences between auction revenues and CRR payouts are in the monthly auctions and additional design changes could be implemented in those auctions prior to the annual auctions for 2020.

Even if the ISO track 1 proposal is effective in reducing purchases of CRRs at large discounts to the expected payout by financial market participants, it still may not eliminate all or even most of the difference between auction prices and CRR payouts. The market structure of retail supply in California, combined with the aggregation of demand node pricing to load aggregation points, could be contributing to relatively low demand for hedging instruments, at least by LSEs. To the extent that low auction prices, and auction revenue shortfalls are due to low hedging demand, the ISO changes will not change these outcomes as they are not a result of the ISO's auction design.

We note that this proposal is only a first step in a longer process of evaluation of the CRR auction and its broader market impacts. Analysis of the effects of the proposed changes, some of which have not been experienced in US markets before, will provide valuable insight toward whether further changes are necessary, or if elements of the proposal should be revisited. As an interim step, therefore, the MSC believes that this option makes considerable sense as a way to reduce the sale of undervalued CRRs in the short-run and provide some evidence of how some kind of auction modifications impact the relationship between auction value and CRR payouts. Therefore, the MSC supports the ISO proposal as a reasonable incremental step, that stands a good chance of limiting auction revenue shortfalls while still preserving the main underlying function of the CRR auction. These changes, together with any track 2 changes that are implemented, will need to be given some reasonable period of time to be in place before their success is evaluated. As part of the track 2 stakeholder process, the MSC strongly suggests that, first, that a wider range of alternatives for reducing auction losses be considered.

One alternative should include establishing a minimum price or per unit fee for auctioned CRRs. Another would be to look at the structure for funding the auction revenue shortfall. The MSC notes that the problem that is the focus in this initiative--the auction revenue shortfall--is fundamentally a transfer payment issue from one set of market participants to another, in contrast, the proposals to address this transfer could have additional negative impacts on the efficiency of the market. While there are reasons to believe that the efficiency impacts associated with the ISO proposal would be acceptable, those associated with the DMM proposal could be more substantial. If the source of the problem constitutes an unacceptable transfer from one group to another, the solution could involve another transfer or fee that would offset these losses without significantly compromising the CRR market.

Our second suggestion is that careful analyses be made of potential CRR auction revenues relative to payouts, categorized by source-sink pair, under alternative auction designs for the 2014-2017 period. This would best be done by running historical bids through implementations of alternative auctions (including elimination of certain source-sink pairs, reductions in annual auction quantities awarded, and minimum price or bid fees). This should be done for the entire four year period in order to minimize the impact of sample error upon the conclusions. The MSC suggests that the results of such analyses should be interpreted carefully, because bidding behavior may change as a result of reforming the auction, so that the anticipated reductions in losses might not be realized. Nevertheless, these simulations of the performance of alternative auction designs using historical bids will provide a better indication of the potential reduction in losses than the analyses that are presently available.

A third suggestion is that the ISO analyze the extent to which there is a general under-valuation of hedging CRRs in ISO markets, rather than simply a low valuation of CRRs that have little value as congestion hedges.

Fourth, as the track 1 changes are implemented, the ISO should assess the extent to which these changes have been effective in reducing the payout to CRRs whose shift factors and day-ahead market payouts are inflated by outages, and consider whether changes in the way CRRs are settled might contribute to improved outcomes.

To summarize, the MSC supports the ISO proposal, but anticipate that further changes will be necessary to either supplement or supplant those proposed here. Whatever changes are made should continue to support the ability of small load-serving entities and non-load-serving entities to access a market for ISO-backed CRRs. The MSC suggests several analyses that can quantify the impact of these and other potential changes, and advise these be undertaken as part of the track 2 process.

General Session Meeting of February 2, 2018⁷

1. Congestion Revenue Rights Allocation and Auction

Mr. Perry Servedio, Sr. Market Design Policy Developer at the ISO, started the discussion by summarizing the ISO's proposed track 1 revisions to the congestion revenue rights process, for which the MSC is preparing an Opinion for submission at this Board of Governors meeting. This was followed by a presentation by MSC member Dr. Scott Harvey on principles for economic and financial evaluation of congestion revenue rights for purposes of hedging physical transactions and for financial trading, and on analyses for identifying whether rights sold through auctions are valued as hedges or for financial gains. Hedges have an economic value to the purchaser that is in excess of the expected settlement in the day-ahead market (the energy price difference between the source and sink nodes), while financial trading would value rights at a level less than their expected settlement. Finally, Mr.

⁷All presentations are available at www.caiso.com/informed/Pages/BoardCommittees/MarketSurveillanceCommittee/Default.aspx

Ryan Kurlinski of the ISO's Department of Market Monitoring summarized the Department's position on reforming the auction, which is that they and some stakeholders believe that it should be eliminated except for reconfiguring rights that third parties offer, and the ISO and its consumers should not be financially backing rights sold in the auction.

2. Transmission Access Charge Structure Review

Mr. Chris Devon, Senior Infrastructure & Regulatory Policy Developer at the ISO, began this agenda item by making a presentation on alternatives for the transmission access charge, in terms of measurement point (at the point of consumption or where the high voltage ISO-controlled grid interfaces with the distribution system) and the measurement of customer usage (whether volumetric based on energy use, or based on peak demand, perhaps coincident with the system or local peak, or a combination). He discussed the relevance of embedded costs versus going-forward incremental costs in this design, and summarized the ISO's straw proposal for revisions of the transmission access charge.

3. Flexible Resource Adequacy and Must Offer Obligation, Phase 2

Dr. Karl Meeusen, Market Design and Regulatory Policy Lead at the ISO, made a presentation summarizing issues associated with the present implementation of this initiative, and the revisions under development as part of Phase 2 of that initiative.

4. Flexible Ramping Product Performance

The recent amounts and prices of the flexible ramping product in the ISO's real-time markets have differed from what was expected during the design of the product, and questions have arisen as to whether it is performing as intended. Mr. Rahul Kalaskar, Manager of Market Validation and Analysis at the ISO, reviewed data on the product's recent performance, including definition of requirements and price formation. Some potential adjustments to these definitions have been identified by ISO staff and were discussed by the attendees that could potentially improve the ability of the product to perform as intended. MSC members in general welcomed changes that would improve the ability of the product to enable the ISO system to manage unexpected net load ramps and provide incentives to bid flexibly and invest in flexible capacity.