

Memorandum

To: ISO Board of Governors

From: Eric Hildebrandt, Executive Director, Market Monitoring

Date: March 20, 2019

Re: **DMM Comments on proposed local market power mitigation enhancements**

This memorandum does not require Board action.

EXECUTIVE SUMMARY

The Department of Market Monitoring (DMM) supports Management's proposed enhancements to the ISO's local market power mitigation rules. The proposed changes should effectively address concerns about bid mitigation of hydro resources raised by some EIM participants and entities considering whether to join EIM.

Several of the changes included in the proposal should encourage increased participation by entities with gas-fired and hydro resources. One of these changes will allow the ISO to update bid caps used in energy market power mitigation each operating day based on gas market conditions and observed prices in the same day gas market. This provision is important to deal with volatile gas prices within the ISO, as well as for EIM entities with gas generation. Another change will eliminate the extension of mitigation from a prior interval to subsequent intervals when mitigation would not otherwise be triggered. This will significantly reduce the total intervals in which mitigated bids are used, while ensuring that bid mitigation is still applied in intervals when congestion occurs on uncompetitive constraints.

Several other elements of the proposal involve potential trade-offs between the benefits of market power mitigation versus the potential for increased participation in the EIM by hydro resources. These include the provision allowing EIM areas to choose to have exports automatically limited when mitigation occurs and provisions that would allow default energy bids for hydro units in the Northwest to be set based on prices in the Southwest and up to 12 months of futures prices.

Although DMM has concerns about these provisions, we support the proposal in light of (1) the specific nature of hydro resources, (2) the lack of a must-offer obligation in the EIM and (3) the potential benefits from increased participation by entities with hydro resources.

COMMENTS

DMM has provided detailed written comments and analysis of the changes in mitigation rules being proposed throughout the stakeholder process.¹ This memo summarizes DMM's comments on key elements of the ISO's *Final Draft Proposal*.²

Updating gas prices used in energy bid mitigation

Under Management's proposal, the ISO will have the ability to raise bid caps used in energy market power mitigation each operating day based on gas market conditions and observed prices in the same day gas market. This provision is important to account for periodic spikes in the same day gas market prices within the ISO, as well as for EIM entities with gas generation.

This provision partially addresses one of DMM's recommended changes to the ISO's Commitment Costs and Default Energy Bid Enhancements (CCDEBE) proposal that was approved the Board in March 2018.³ In this initiative, the ISO is proposing to adjust gas prices used in reasonableness thresholds used to mitigate energy bids. DMM continues to recommend that the ISO also develop the ability to increase start-up and minimum load bids used in the real-time market when prices in the same day gas market increase significantly above next day gas price indices used to set commitment cost bid caps.

Eliminating carryover of mitigated bids to subsequent intervals

The ISO proposes to eliminate the extension (or *carryover*) of mitigation from one 15-minute or 5-minute interval to subsequent intervals in that hour or 15-minute period. This carryover of mitigation originally stemmed from a combination of software issues and concerns about accuracy of earlier mitigation designs. Given the current levels of mitigation accuracy, DMM supports the proposal to eliminate the carryover of a resource's mitigated bids from one interval into subsequent intervals. This provision will reduce the impacts of bid mitigation and further improve market power mitigation

¹ *Comments on Local Market Power Mitigation Enhancements Draft Final Proposal*, Department of Market Monitoring, February 11, 2019. <http://www.caiso.com/Documents/DMMComments-LocalMarketPowerMitigationEnhancements-DraftFinalProposal.pdf>

² *Local Market Power Mitigation Enhancements Draft Final Proposal*, California ISO, January 31, 2019: http://www.caiso.com/Documents/DraftFinalProposal-LocalMarketPowerMitigationEnhancements-UpdatedJan31_2019.pdf

³ Memo to ISO Board of Governors, re: Department of Market Monitoring Comments on CCDEBE Proposal, March 14, 2018, pp. 1, 4-6. http://www.caiso.com/Documents/Decision_CCDEBEProposal-Department_MarketMonitoringMemo-Mar2018.pdf

accuracy. Analysis by DMM performed as part of this initiative indicates that this change could reduce the frequency of mitigation by as much as 20 percent.⁴

Limiting net exports when mitigation is triggered

The ISO proposes to give each EIM entity the option of limiting the net exports out of its balancing area when resources in the area are subject to bid mitigation. This provision is designed to ensure that energy is not transferred from one EIM area to another area due to market power mitigation lowering the market bids submitted by EIM participants.

As illustrated in DMM's prior comments on the Draft Final Proposal, this provision could either increase or decrease market efficiency.⁵ To the extent that a resource's market bids accurately reflect the resource's marginal opportunity costs, but default energy bids are lower than the resource's actual marginal costs, the net export constraint would increase market efficiency.

However, if a resource's market bids *exceed* actual marginal opportunity costs and default energy bids are not lower than the unit's actual marginal costs, the net export constraint may reduce market efficiency. Under this scenario, the limitation on net exports would also reduce how transfers from one EIM area may help mitigate uncompetitive conditions in another EIM area. This represents a change in the current market design, under which the application of bid mitigation in one balancing can help to mitigate potential market power in an adjacent balancing area.

Another concern about the proposal to limit exports when mitigation is triggered involves how congestion revenues are allocated when this export limit is binding. When the proposed net export constraint triggered by mitigation is enforced and binding, the ISO proposes to allocate 100 percent of the constraint's congestion rents to the exporting balancing area – rather than allocating congestion revenue equally between the exporting and importing areas.

The ISO's rationale for allocating 100 percent of congestion revenues to the exporting area in this scenario is that the ISO allocates congestion rents this way for net export constraints that are triggered when an EIM area fails to meet a downward flexible ramping sufficiency test. DMM's concerned that under both these scenarios, allocating 100 percent of congestion revenues to the exporting area may create incentives for inefficient scheduling and bidding. However, alternatives that DMM has considered for allocating net export constraint congestion rents may create outcomes that are potentially even more problematic. Therefore, DMM does not currently have a proposal for an alternative allocation scheme.

⁴ *Market Power Mitigation Issues*, Energy Imbalance Market Offer Rules Technical Workshop, July 19, 2018, slides 5-6. <http://www.caiso.com/Documents/DMMPresentation-EnergyImbalanceMarketOfferRulesTechnicalWorkshop-Jul19-2018.pdf>

⁵ *Comments on Local Market Power Mitigation Enhancements Draft Final Proposal*, p. 4.

In practice, DMM believes the net export constraint should be unnecessary given the relatively high default energy bids for hydro resources that will result under the ISO's proposal. Thus, the use and impacts of the net export constraint represents an issue that warrants ongoing monitoring and the ISO should be prepared to make any adjustments that may be appropriate given actual market experience.

Default energy bids for hydro resources

The ISO is proposing a special default energy bid that will be available to all hydro resources which is designed to ensure that when mitigation is triggered, mitigated bids are not below the resource's opportunity costs. The new approach being proposed is similar to the approach currently used for many hydro resources which have selected the negotiated default energy bid option incorporated in the ISO tariff. However, DMM questions the addition of two additional provisions in the default energy bid calculation which may not be needed to reflect the actual opportunity costs of many hydro resources.

- The first of these provisions allows opportunity costs for hydro resources in the Northwest to be based on prices in the Southwest (i.e. Palo Verde hub). DMM has questioned this provision because higher prices often occurring in the Southwest reflect the *value of transmission* from the Northwest to the Southwest, rather than the *value of energy* in the Northwest.
- The second of these provisions would allow hydro resources indicating they have 12 months of storage capability to have default energy bids based on futures prices 12 months in the future. DMM has questioned this provision on the basis that this 12 month period often extends beyond the current hydro cycle and into the summer of the next year hydro year.

DMM's comments on the *Final Draft Proposal* includes an analysis of the proposed default energy bid for hydro resources with and without these provisions. A summary of this analysis is included as attachment 1 to this memo. As shown in Figures 1 and 2:

- Both of the hydro default energy bids are almost always greater than the resource's LMP (see Figures 1 and 2). Without inclusion of the Palo Verde prices in the *Geo Floor*, LMPs exceed the DEB in only 1 percent of intervals. With Palo Verde prices included in the calculation, the LMPs exceed the DEB in only 0.4 percent of intervals.
- The combined effect of using prices at Palo Verde and 12 months of futures price adds about \$10/MWh to the default energy bids in the late winter and spring months, raising it from an average of about \$40/MWh to about \$50/MWh (see Figure 1). During these months, the default energy bid would frequently be set by futures prices at Palo Verde for August 2018 (plus the 10 percent adder included in the formula).

- Beginning in September 2018, these provisions add about \$20/MWh, raising the default energy bids from a range of about \$55 to \$65/MWh to about \$75 to \$85/MWh (see Figure 2). During these months, the default energy bid would frequently be set by futures prices at Palo Verde for August 2019 (plus the 10 percent adder included in the formula).

As show in Figure 3 and Table 1:

- Under both default energy bid formulas, the default energy bid would be greater than the LMP during less than 2 hours during 98 percent of days.
- Based on 2018 prices, the default energy bid under both formulas would exceed the LMP during 4 to 5 hours on only one or two days of the year, and would never exceed the LMP during more than 5 hours on any day.

Based on this analysis, DMM believes that under the ISO's proposed methodology the standard default energy bids available to hydro resources in the Northwest will be high enough to allow hydro units to avoid being dispatched in all but a very small percentage of intervals and hours per day – *with* or *without* the use of prices at the Palo Verde hub and a full 12 months of futures prices.

Thus, the proposed approach appears to create very minimal risk that a hydro resource would be depleted, unless it was extremely energy limited on numerous days and was also subject to mitigation during a significant portions of hours in which high prices occurred.

In the event participants view the standard default energy bid options for hydro resources as inadequate for any resource, participants can and should continue to propose alternative more customized approaches under the negotiated default energy bid option of the ISO tariff. Under this option, default energy bids can be calculated based on actual projected energy limits for the following operating day.

At the same time, including these two provisions in the methodology results in a limited increase in the default energy bid during the spring and fall months and still provides significant protection against the potential for the exercise of market power.

CONCLUSION

DMM supports the overall proposal in light of (1) the special nature of hydro resources, (2) the lack of a must-offer obligation in the EIM, and (3) the competitive benefits that can come with increased participation by entities with hydro resources.

DMM's analysis shows that the new default energy bid for hydro resources being proposed is high enough that resources could still bid high enough to rarely be dispatched even when subject to mitigation, while being low enough to significantly mitigate market power (or the ability to significantly raise prices) when market conditions are uncompetitive.

DMM notes that the special default energy bid offered for hydro resources would not be appropriate for other resources. Under the ISO tariff, default energy bids used in mitigation for all other resources are designed to be reasonable estimates of a resource's actual marginal cost – including opportunity costs based on the actual characteristics of each resource. For other energy limited energy resources, such as gas-resources with environmental limitations, opportunity costs can and should be based on actual energy limits of the resource over a specific time period (e.g. daily, monthly or annual). This can be done using the negotiated default energy bid option in the ISO tariff.

The impact of several provisions of the proposal merit ongoing review after implementation and the ISO should be prepared to make any adjustments that may be warranted based on market conditions. These provisions include (1) the option to have net exports automatically limited when bid mitigation is triggered in an area, and (2) the options to have default energy bids for resources in the northwest based on Palo Verde prices and a full 12 months of futures prices. The impact of these provisions can be readily monitored based on market data and results available to the ISO and DMM.

Attachment 1

Analysis of proposed default energy bid for hydro resources

This analysis compares the default energy bid that would have resulted from this methodology for a typical hydro resource in the Northwest to 15-minute energy imbalance market prices in the 2018 calendar year.

Figures 1 and 2 compare the default energy bids that would result under the proposed approach for a hydro unit in the Northwest (PacifiCorp West) to 15-minute locational market prices (LMPs) for a resource in that area during the 2018 calendar year.

- The blue line shows the default energy bid that includes the Palo Verde trading hub and 12 months of futures data in the *Geo Floor*.
- The orange line shows the default energy bid based on 12 months of futures data for Mid-C, but does not include Palo Verde prices in the *Geo Floor*.

As shown in Figures 1 and 2:

- Both of the hydro default energy bids are almost always greater than the resource's LMP (see Figures 1 and 2). Without inclusion of the Palo Verde prices in the *Geo Floor*, LMPs exceed the DEB in only 1 percent of intervals. With Palo Verde prices included in the calculation, the LMPs exceed the DEB in only 0.4 percent of intervals.
- The combined impact of using prices at Palo Verde and 12 months of futures prices adds about \$10/MWh to the default energy bids in the late winter and spring months, raising it from an average of about \$40/MWh to about \$50/MWh (see Figure 1). During these months, the default energy bid would frequently be set by futures prices at Palo Verde for August 2018 (plus the 10 percent adder included in the formula).
- Beginning in September 2018, these provisions add about \$20/MWh, raising the default energy bids from a range of about \$55 to \$65/MWh to about \$75 to \$85/MWh (see Figure 2). During these months, the default energy bid would frequently be set by futures prices at Palo Verde for August 2019 (plus the 10 percent adder included in the formula).

Figure 1. Hydro DEBs based on prices at Palo Verde vs. Mid-C (Jan-June 2018)

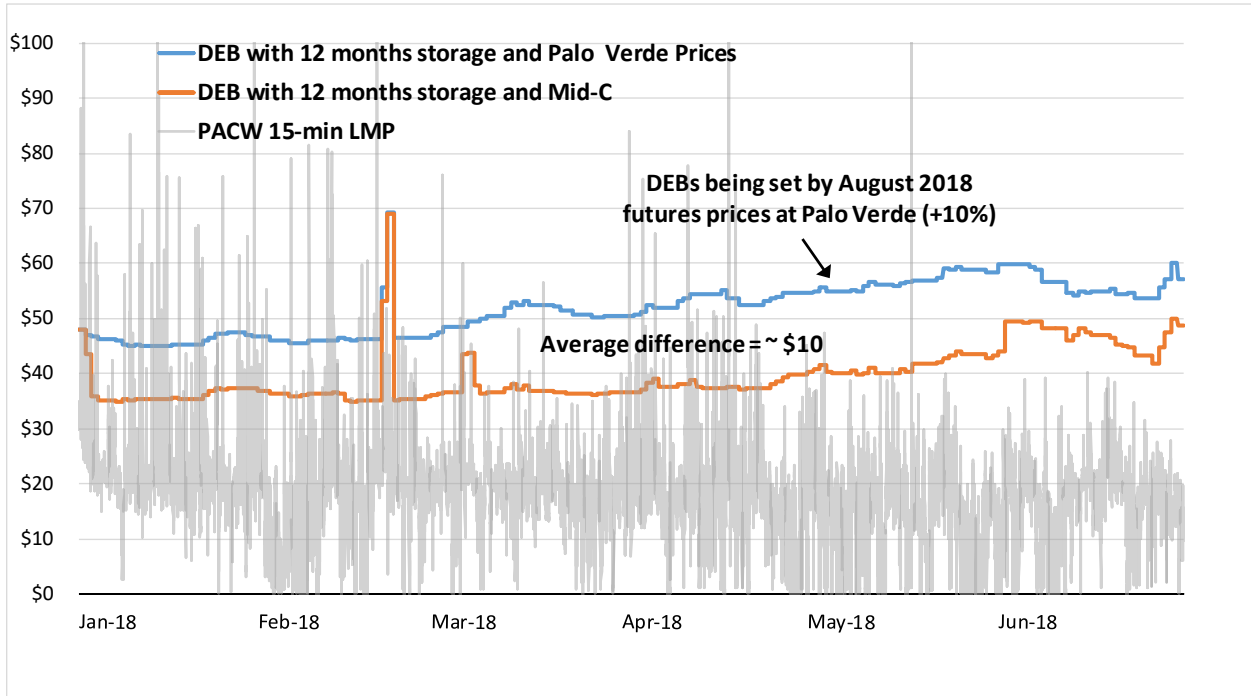


Figure 2. Hydro DEBs based on prices at Palo Verde vs. Mid-C (July-Dec 2018)

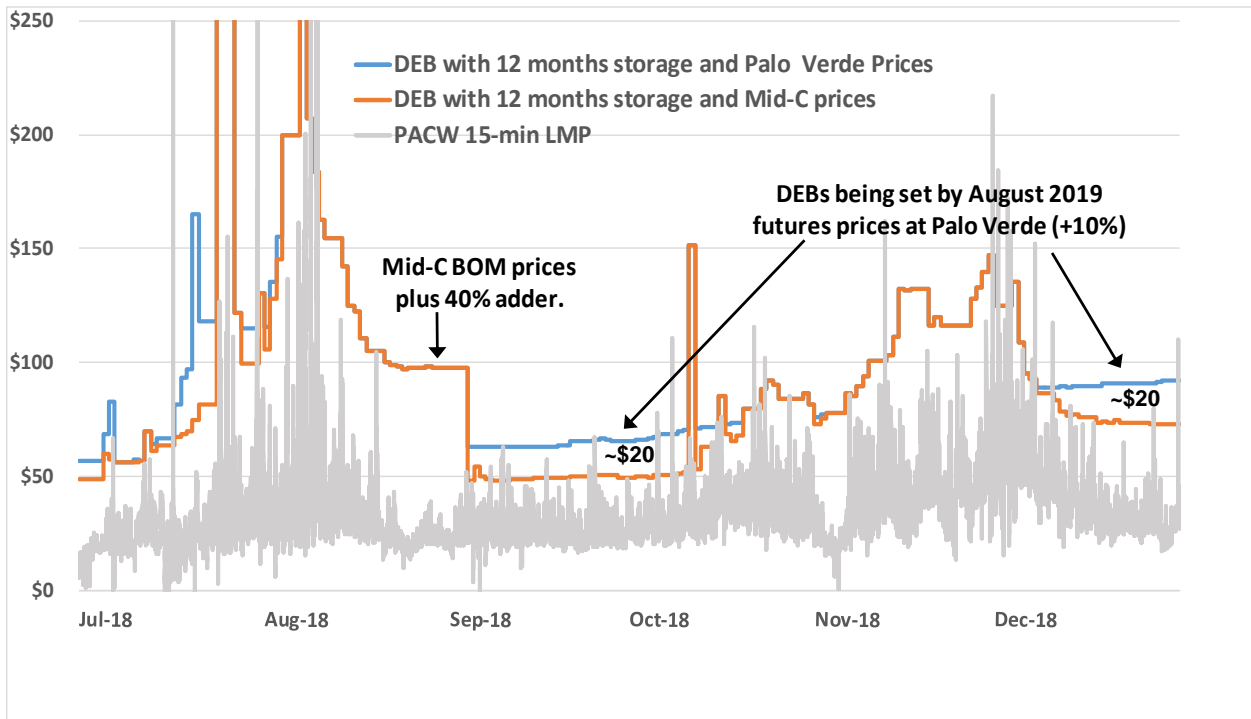


Figure 3 shows the total number of hours per day in 2018 that the LMP in the PacifiCorp West area would be higher than the standard default energy bid for a hydro unit in this area under four different scenarios. These scenarios include different combinations of default energy bid based on futures prices for either 6 or 12 months, and with and without Palo Verde prices included in the *Geo Floor* of the formula.

Table 1 compares the total number of hours per day that EIM prices in the PacifiCorp West area during 2018 would be higher than default energy bids based on (1) Mid-C prices and 6 months storage, compared to default energy bids that include (2) Palo Verde prices and a full 12 months of futures prices.

As show in Figure 3 and Table 1:

- Under both default energy bid formulas, the LMP would be greater than the default energy bid during less than 2 hours during 98 percent of days.
- Based on 2018 prices, the LMP under both formulas would exceed the default energy bid during 4 to 5 hours on only one or two days of the year, and would never exceed the default energy bid during more than 5 hours on any day.

**Figure 3. Total Hours per day with LMP greater than hydro DEB
(2018 data for PacifiCorp West area)**

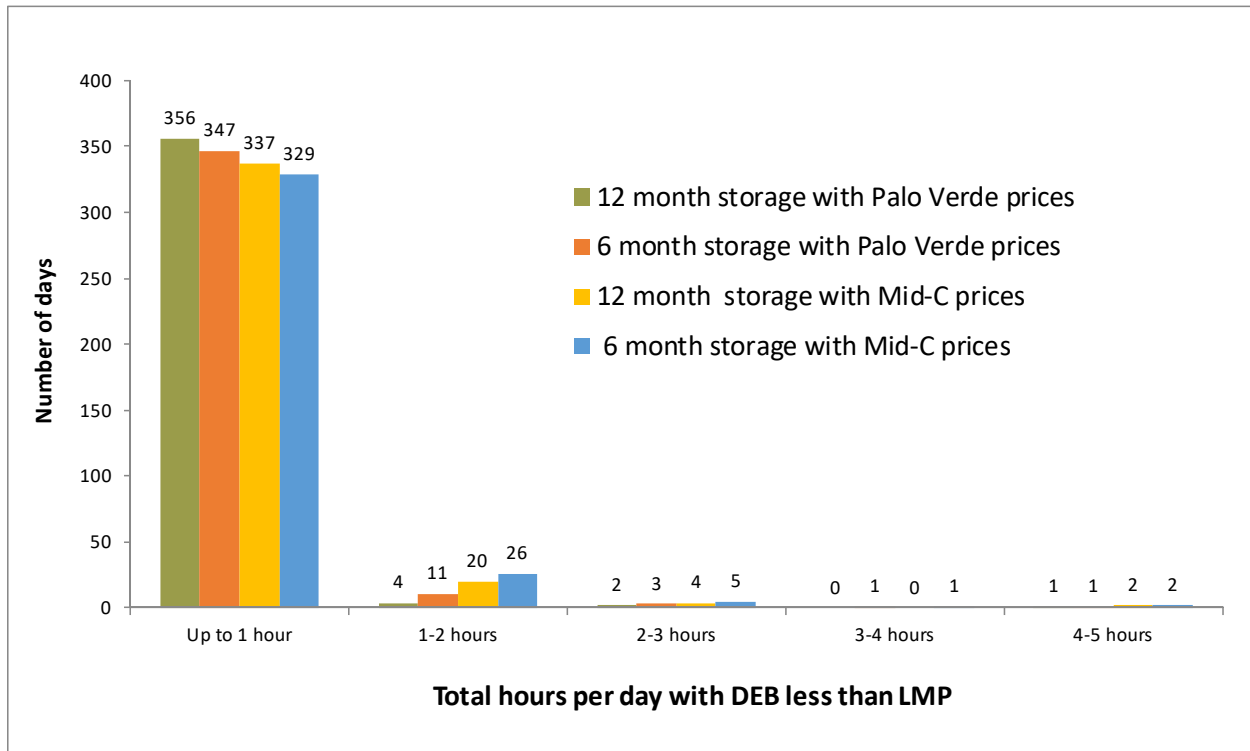


Table 1. Hours per day LMP > hydro DEB

Hours/day LMP > DEB	Mid-C hub and 6 months of futures prices		Palo Verde hub and 12 months of futures prices	
	Days	Percent	Days	Percent
1 hour or less	329	90.6%	356	98.1%
1-2 hours	26	7.2%	4	1.1%
2-3 hours	5	1.4%	2	0.6%
3-4 hours	1	0.3%	0	0.0%
4-5 hours	2	0.6%	1	0.3%
More than 5 hours	0	0.0%	0	0.0%
	363		363	