

Comments on the Addendum to Draft Final Proposal on Lowering Bid Floor
Department of Market Monitoring
October 10, 2016

The ISO's *Addendum to Draft Final Proposal* explains that "after consideration of stakeholder comments on the *Draft Final Proposal*, the ISO will defer proposing a lower energy bid floor, and will continue to monitor levels of self-schedule curtailments."¹ DMM appreciates that the ISO modified its initial position on this issue by considering the comments of stakeholders, as well as comments and quantitative analysis submitted by DMM on the *Draft Final Proposal*.

I. Response to stakeholder comments

Although the *Addendum to Draft Final Proposal* continues to indicate that "comments generally supported lowering the bid floor," the ISO's summary of stakeholder comments shows that stakeholders are in fact quite mixed on this proposal, with roughly the same number of participants opposing the ISO's proposal as support it.² Significantly, those opposing the proposal included the two scheduling coordinators that submit bids for most of the wind and solar generation in the ISO system (SCE and PG&E). These entities indicate that the proposal would not incent more bids from these renewable resources, as the ISO was contending. Other participants indicated that the ISO should consider lowering the bid floor only after the flexible ramping product is implemented (Calpine and NV Energy).

WPTF has expressed concern about the transparency of the ISO's process, and suggested that after a lengthy stakeholder process the proposal to lower the bid floor was dropped as a result from DMM "whispering" about a theoretical "gaming opportunity." DMM clarifies that all of DMM's concerns about gaming and market power were articulated in in DMM's written comments in this stakeholder process, and that DMM has not raised any other gaming concerns with the ISO.

DMM has provided extensive analysis and comments explaining that DMM's main reasons for opposing the proposal involved the lack of benefits the proposal would provide in terms of reduced curtailments or more efficient pricing. DMM's analysis indicates that the proposal to lower the bid floor was based on a theoretical future concern (that the ISO will start running out of decremental energy bids as renewable generation increases), and the theory that lowering the bid floor would effectively address this issue were it to materialize. DMM's

¹ *Self-Schedules Bid Cost Recovery Allocation and Bid Floor Addendum to Draft Final Proposal*, September 16, 2016, p. 4: <http://www.caiso.com/Documents/AddendumtoDraftFinalProposal-Self-SchedulesBidCostRecoveryAllocationandBidFloor.pdf>.

² *Comments Matrix – Self Schedules Bid Cost Recovery Allocation and Bid Floor – Draft Final Proposal*, pp.1-2: <http://www.caiso.com/Documents/CommentsMatrix-Self-SchedulesBidCostRecoveryAllocationandBidFloor-DraftFinalProposal.pdf>.

understanding is that Management’s final decision was based largely on a similar conclusion that the proposal would not provide significant benefits at this time.

On the stakeholder call, some participants appeared to also express concern that the decision not to lower the bid floor was contrary to analysis the ISO had performed on this issue. In response to stakeholder requests for some analysis of the need to lower the bid floor, the ISO included two charts in the *Draft Final Proposal*. DMM’s comments on the *Draft Final Proposal* included quantitative analysis by DMM which indicated a very different picture of market conditions and trends than those included in the ISO’s *Draft Final Proposal*.³ The following section provides additional analysis which DMM believes demonstrates that the analysis in the ISO *Draft Final Proposal* is not reflective of actual market conditions and trends that are relevant to this issue and – in some cases – appear to include some inaccuracies.

II. Further analysis of the need to lower bid floor

The ISO’s *Addendum to Draft Final Proposal* explains that “the ISO will defer proposing a lower energy bid floor, and will continue to monitor levels of self-schedule curtailments.” As the ISO monitors conditions going forward for indications that it may be beneficial to reconsider lowering the bid floor, DMM recommends that the ISO use different metrics than those presented in the *Draft Final Proposal*.

As discussed below, DMM believes analysis in the ISO’s *Draft Final Proposal* is not reflective of actual market conditions and trends that are relevant to this issue and – in some cases – appear to include some inaccuracies. In this section, DMM also provides suggestions for metrics which DMM believes would allow the ISO to more accurately monitor for indications that it may be beneficial to reconsider lowering the bid floor.

Frequency of power balance relaxations

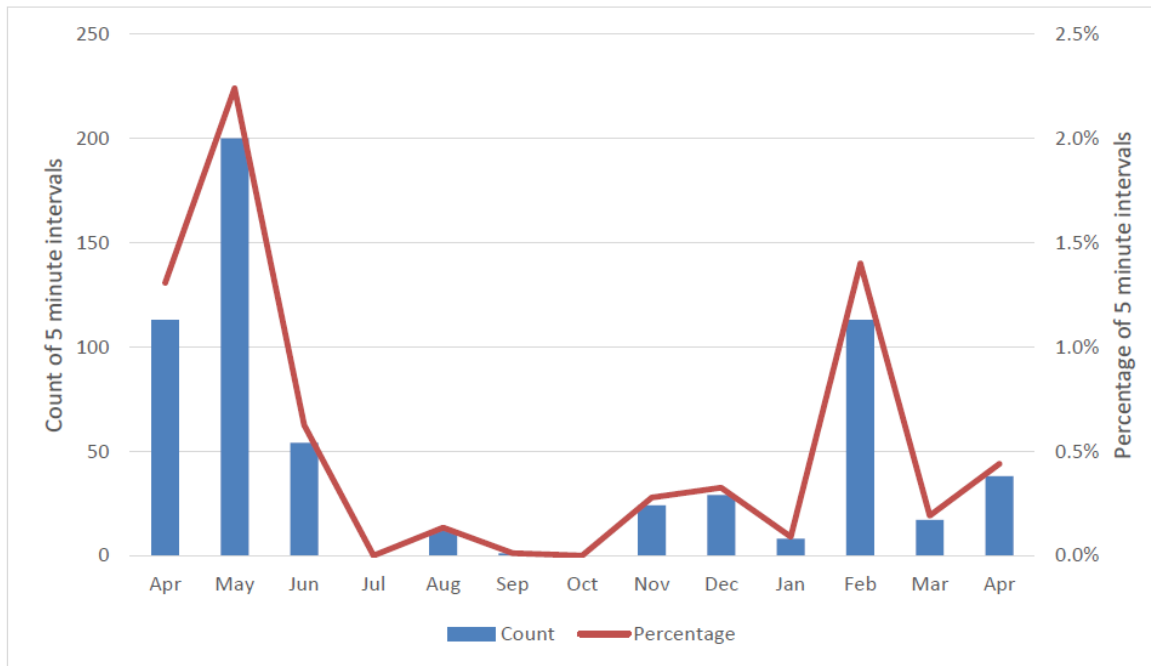
The first metric presented in the *Draft Final Proposal* is a summary of the frequency that the power balance constraint has been relaxed due to an excess of energy from April 2015 to April 2016. DMM agrees that this is one of the primary metrics that should be used to assess this issue (see Figure 1 in *Draft Final Proposal*). However, DMM believes the data presented in the *Draft Final Proposal* appear to include some inaccuracies, and that these data indicate that market conditions and trends do not indicate this is a significant issue.

Figure 1 below shows Figure 1 from the *Draft Final Proposal*, while Figure 2 shows DMM’s analysis of these same data over a longer period of time through September 2016. The ISO’s analysis indicates that during February 2016 the frequency of power balance constraint relaxations due to an excess of energy rose to about 1.2 percent of 5-minute intervals.

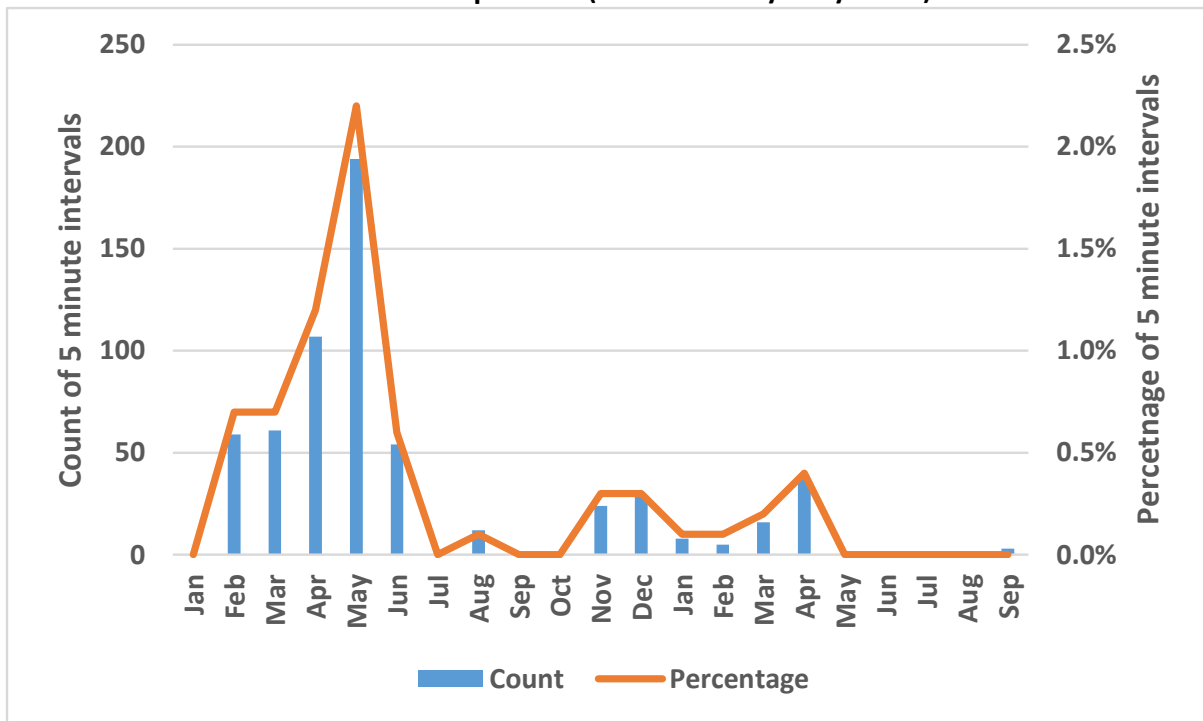
³ *Comments by Department of Market Monitoring on Self-Schedules Bid Cost Recovery Allocation and Lower Bid Floor Draft Final Proposal*, August 23, 2016:
http://www.caiso.com/Documents/DMMComments_Self_SchedulesBidCostRecoveryAllocation_BidFloor.pdf.

**Figure 1. Frequency of 5-minute intervals with power balance constraint violation in CAISO
(from ISO's Addendum to Draft Final Proposal, p, 8)**

Figure 1 Frequency of real-time intervals with power balance constraint violation CAISO BAA April 2015 – April 2016



**Figure 2. Frequency of 5-minute intervals with power balance constraint violation in CAISO
Jan 2015 to Sept 2016 (based on analysis by DMM)**



However, as shown in Figure 2, DMM’s analysis indicates that during this month the power balance constraint was relaxed due to an excess of energy during only about 0.1 percent of 5-minute intervals (or 4 intervals). After correcting for this apparent miscalculation and viewing this metric over a wider period of time, the data in Figure 2 suggest a clear trend that the frequency of power balance relaxations due to excesses of energy is very low and decreasing in 2016 compared to last year – despite the significant increase in solar and hydro energy in 2016 noted in the ISO’s *Draft Final Proposal*.

Negative load bias during power balance relaxation

A second key metric DMM suggests that should be used to assess the frequency of power balance relaxations for excess energy is the amount of the excess relative to the *load bias* being entered by the ISO during the interval when the excess occurs. The load bias is the ISO operator’s estimate of the adjustment in the real-time market model to account for load forecast inaccuracies, generation deviations and other factors during that 5-minute interval – as well as future 5-minute intervals.

If large negative load bias is being entered when the energy balance needs to be relaxed for a relatively smaller excess of generation in the model, this indicates that the excess is in fact within the “range of error” of the market model and does not represent a true excess of generation. This is reflected in the *load bias limiter* feature of the ISO software. This feature is triggered whenever the negative load bias being entered exceeds the excess by which the energy balance needs to be relaxed.⁴ When the load bias limiter is triggered for an excess, prices are set based on the last economic bid instead of the -\$150/MW penalty price.

Table 1 shows a summary of the frequency of power balance relaxations for excess energy, along with the amount of the excess relative to the *load bias* being entered by the ISO during these intervals. As shown in Table 1, since 2015 during 5-minute intervals when the power balance constraint was relaxed for excess energy, the amount of this excess averaged 161 MW compared to an average negative load bias of 808 MW. Since July 2015, the amount of the negative load bias being entered was greater than the excess by which the power balance constraint needed to be relaxed in all but one 5-minute interval.

DMM believes these data – along with the very low and declining frequency of power balance relaxations made to resolve energy excesses provides strong evidence that the system excesses that have occurred are typically within the “range of error” of the market model and do not typically represent significant system over-generation situations. Instead, most power balance relaxations for excess energy that have occurred in the 5-minute market appear to be what some participants have referred to as brief “spurious” events which do not reflect significant system over-generation situations.

⁴ For example, if an excess of 30 MW occurs when a load bias of -35 MW was in effect, the excess is deemed to have been caused by biasing the load down too far.

Table 1. Comparison of excess and load bias during 5-minute intervals with power balance constraint violation in CAISO

Year	Month	Number of intervals	Excess (percent of 5-minute intervals)	Average Excess (MW)	Average load bias (MW)	Bias > Excess (percent of intervals with excess) *
2015	Jan	0				
	Feb	59	.7%	-82	-424	88%
	Mar	61	.7%	-76	-293	84%
	Apr	107	1.2%	-266	-429	97%
	May	194	2.2%	-89	-493	94%
	Jun	54	.6%	-92	-586	93%
	Jul	0				
	Aug	12	.1%	-80	-333	100%
	Sep	1	.0%	-85	-750	100%
	Oct	0				
	Nov	24	.3%	-66	-796	100%
	Dec	29	.3%	-444	-555	97%
2016	Jan	8	.1%	-91	-744	100%
	Feb	5	.1%	-66	-550	100%
	Mar	16	.2%	-138	-522	100%
	Apr	37	.4%	-388	-1,189	100%
	May	0	.			
	Jun	0	.			
	Jul	0				
	Aug	0				
	Sep	3	.0%	-294	-3,650	100%
Average (MW)				-161	-808	

* Percentages in the right most column indicate percent of 5-minute intervals during which the amount of excess was less than the negative load bias entered by operators during that interval. During these intervals the load bias limiter is triggered to reflect the assumption that the excess was caused by over biasing of load downward and did not represent true excess of generation.

Volume of curtailed self-schedules

The second metric presented by the ISO in support of its initial recommendation to lower the bid floor is the frequency of self-schedule curtailment in terms of the percentage of intervals during which any self-schedule was curtailed in the ISO system. The ISO's analysis is provided in Figure 3 below.

The ISO's *Draft Final Proposal* suggests that curtailment of self-schedules has increased and is likely to increase in the future:

...in the month of April 2016 the number of intervals neared 10 percent. When self-schedules are cut, this can be to address system wide over-supply or when there are insufficient bids to address local congestion. ...the high instances of self schedule curtailments in April 2016 was caused by high spring runoff where hydro resources were not economically bid in combination with increased solar. The levels of hydro and solar in 2016 thus far have both been higher than any of the previous three years. There will be more solar on the system next year, and likely more instances of self-schedule curtailments. (p.8)

DMM believes this second metric used by the ISO – the frequency of intervals when any self-schedule is curtailed – is not a good indicator of the actual sufficiency of decremental bids or the potential benefits of lowering the bid floor for two reasons. First, as noted by the ISO, this metric does not differentiate between curtailments to address system wide over-supply versus very local issues that can often be resolved by curtailing a very limited number of resources. Second, the metric does not take into account the volume of curtailments.

DMM's review of these data indicate that in fact, most of the curtailments counted in the ISO's analysis – especially in 2016 – are very small curtailments of solar, wind and hydro resources in local "generation pockets" with limited transmission. This is reflected in Figure 4, which compares the ISO metric (the frequency of intervals with any self-schedule curtailment) to the total volume of curtailments. Figure 4 also provide this analysis through September, while data in the *Draft Final Proposal* stops in April 2016.

As shown in a comparison of Figures 3 and 4, the data in Figure 4 on the volume of curtailments suggest a declining trend in the volume of curtailments, while the ISO data in Figure 3 was cited in the *Draft Final Proposal* as indicating that self-schedule curtailments will increase.

Figure 3. Frequency of curtailed self-schedules
 (from ISO's Addendum to Draft Final Proposal, p,9)

Figure 2 Frequency of real-time intervals with curtailed self-schedules CAISO BAA April 2015 – April 2016

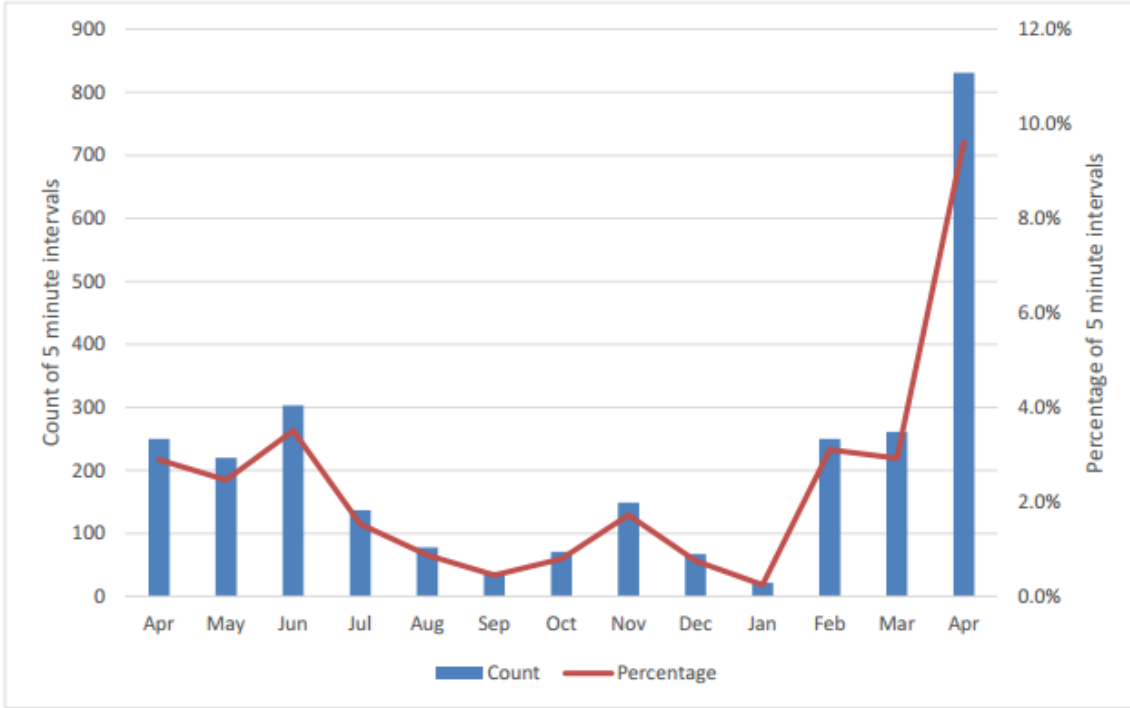
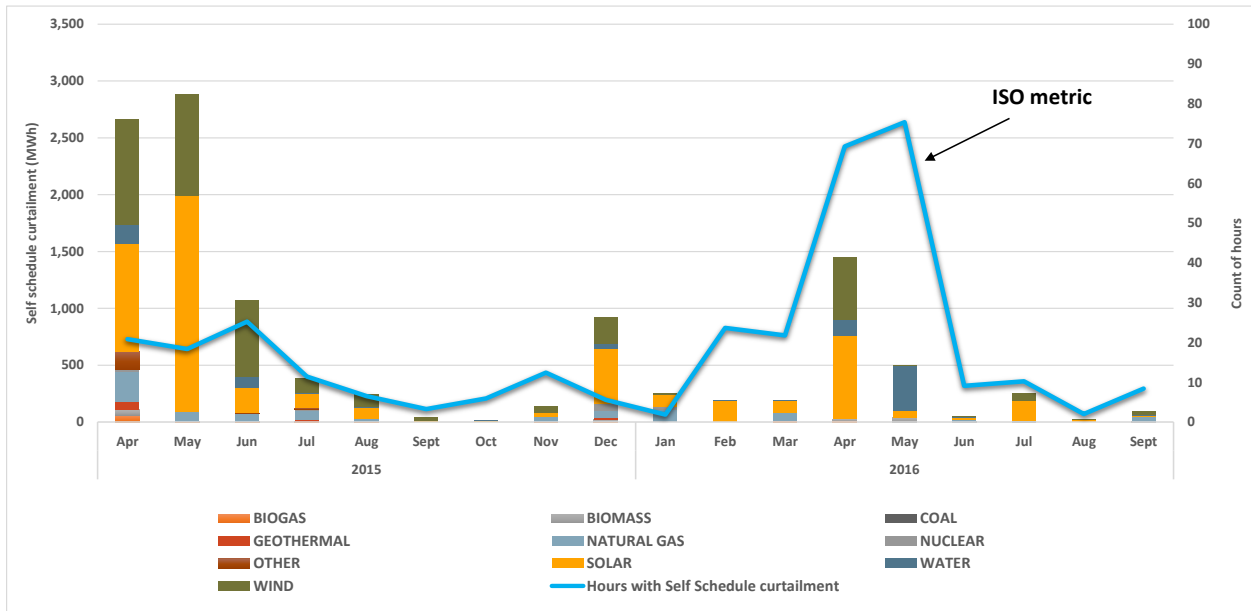


Figure 4. Total volume of curtailed self-schedules



In addition, DMM notes that if the ISO uses this metric in future assessments, the portion of curtailments that might actually be system wide over-supply can be quantified based on whether or not the system power balance constraint was relaxed (or if a major constraint such as Path 26 was binding). For example, as noted by the ISO in the *Draft Final Proposal*, during April 2016 at least one resource was curtailed in about 10 percent of intervals. However, as shown in Table 1, during April 2016 the power balance constraint was relaxed for an excess during only 0.4 percent of intervals. Thus, almost all of the curtailments in April highlighted by the ISO in the *Draft Final Proposal* were for local versus system reasons.

III. Conclusions and Recommendations

DMM appreciates that the ISO modified its initial position on this issue by considering the comments of stakeholders, as well as comments and quantitative analysis submitted by DMM on the *Draft Final Proposal*. DMM has provided extensive analysis and comments explaining that DMM's main reasons for opposing the proposal involved the lack of benefits the proposal would provide in terms of reduced curtailments or more efficient pricing. DMM believes the analysis we have presented in our prior comments and in these comments provides strong evidence that the system excesses that have occurred are typically within the "range of error" of the market model and do not typically represent significant system over-supply situations.

The ISO's *Addendum to Draft Final Proposal* explains that "the ISO will defer proposing a lower energy bid floor, and will continue to monitor levels of self-schedule curtailments." As the ISO monitors conditions going forward for indications that it may be beneficial to reconsider lowering the bid floor, DMM recommends that the ISO use different metrics than those presented in the *Draft Final Proposal*. As discussed in these comments, DMM is providing suggestions for metrics which DMM believes would allow the ISO to more accurately monitor for indications that it may be beneficial to reconsider lowering the bid floor.