Potential Impact of Proxy Demand Response on Local Market Power Mitigation

Department of Market Monitoring
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Summary

Under the ISO's final proposal for Proxy Demand Response (PDR), no special provisions would be included for application of Local Market Power Mitigation (LMPM) to PDR. The Department of Market Monitoring (DMM) agrees that the application of LMPM to PDR would be highly problematic, ineffective, and possibly even counterproductive. However, DMM has identified a potential consequence of PDR within transmission constrained "load pockets" that may undermine the effectiveness of how LMPM is applied to other generating resources. This whitepaper provides an example of this potential problem, outlines three options to address this problem, and provides an initial recommendation for addressing this issue. While this issue may not pose a significant problem unless a relatively substantial volume of PDR is offered within load pockets, DMM is seeking comment on this initial recommendation at this time in order to ensure that this potential problem may be addressed in a timely manner.

Description of Issue

Under the ISO's final proposal for Proxy Demand Response, no special provisions would be included for application of Local Market Power Mitigation to PDR.[1] DMM believes that application of LMPM to PDR would be highly problematic, ineffective, and possibly even counterproductive, for several reasons. First, the approaches incorporated in the current tariff that might be used to determine an appropriate Default Energy Bid (DEB) for PDR resources to be used in LMPM would be highly problematic.

- Under the Negotiated DEB option, it may theoretically be appropriate to set DEBs for PDR resources based on factors such as the cost of curtailments to customers (or value of unserved energy), the "trigger price" used in DR programs, or opportunity cost of dispatching limited use PDR. In practice, however, such DEBs may be very hard to objectively determine and/or are likely to be relatively high (i.e., essentially equaling the PDR's bid price).

- Another approach for setting DEBs for PDR could be the LMP-based option currently included in the ISO tariff. However, under this approach, a PDR resource's DEB would tend to simply reflect the initial bid prices of the PDR during hours when the PDR was dispatched. In addition, under the LMP-based approach, a second DEB methodology is still needed in order to set the DEB during any period when the PDR is not eligible for an LMP-

[1] In PG&E's August 14, 2009 comments on the ISO's PDR proposal, PG&E expressed the concern that the ISO's proposal should specify that PDR should be subject to LMPM mitigation in an equivalent manner as generation resources. See p.3 of PG&E's comments at http://www.caiso.com/240d/240dced02e1f0.pdf. No other participant seems to have raised any issues relating to LMPM.

based DEB (e.g., initially and during any period when the PDR was not dispatched enough during the previous 90 days to be eligible for an LMP-based DEB).[2]

- Meanwhile, other bid mitigation approaches that might lead to a relatively low priced DEBs could even be counterproductive to the extent that such DEBs discouraged PDRs with higher curtailment costs or "trigger prices" and/or prevented PDR resources with use limitations from being conserved and utilized only during the most critical and higher priced periods.

More importantly, however, in reviewing the implications of the applicability of LMPM to PDR, DMM has identified a potential consequence of PDR within "load pockets" that may undermine the effectiveness of how LMPM is applied. Figures 1 and 2 illustrate this concern, using a simplified example of LMPM as it would be applied within a load pocket in which supply was constrained by one or more non-competitive paths. In this example, it is assumed that the supply that can be used to meet demand in this load pocket is limited to seven generating units (G1 through G7) and one PDR resource. It is assumed that the PDR resource is subject to LMPM bid mitigation, but has a relatively high DEB (i.e., equal to its market bid in this example). As shown in Figure 1, in this example five generating units (G1 through G5) and the PDR resource are dispatched in the All Constraints (AC) run, and are therefore subject to bid mitigation. As shown in Figure 2, under this scenario, the relatively high priced PDR would end up setting the LMP for this constrained area, despite the fact that two generators (G6 and G7) had substantially lower DEBs.

In practice, the potential for this to occur – particularly in the short term when PDR is first implemented in 2010 – may be limited due to several factors.

- First, a significant portion of capacity within many load pockets appears to be under a forward contract or otherwise owned/controlled by an LSE.

- In addition, since bid mitigation is applied to the entire output of resources that are dispatched up in the AC run, there is typically a significant volume of additional mitigated generating capacity available to meet demand in both the IFM and RTM.

- Finally, if the volume of PDR resources within any load pocket in 2010 is relatively small and the price is relatively high, the scenario in Figures 1 and 2 may be unlikely to occur. Rather, PDR may tend to be dispatched only when system level energy prices get relatively high.

[2] As described in the *Business Practice Manual for Market Instruments,* to be eligible for the LMP-based DEB option in the Integrated Forward Market (IFM), a resource must have been dispatched about 2 percent of hours in the IFM over the previous 90 days. For real-time, the thresholds are around 1 percent of intervals (pp D-3 to D-4).

Figure 1. HASP LMPM Runs

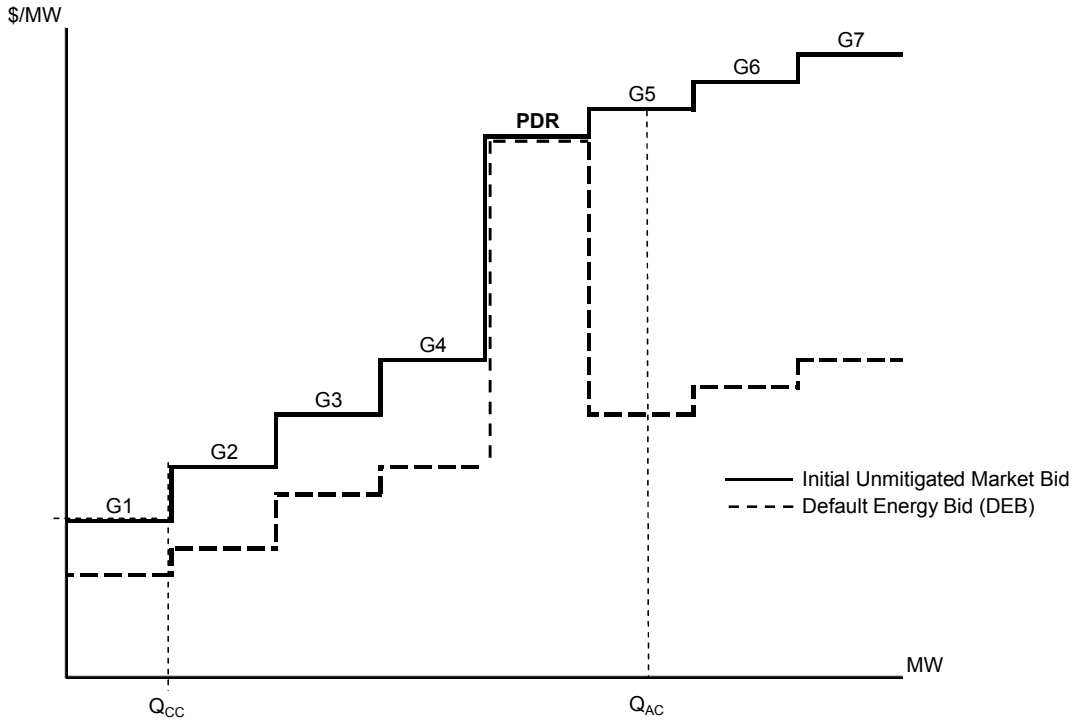
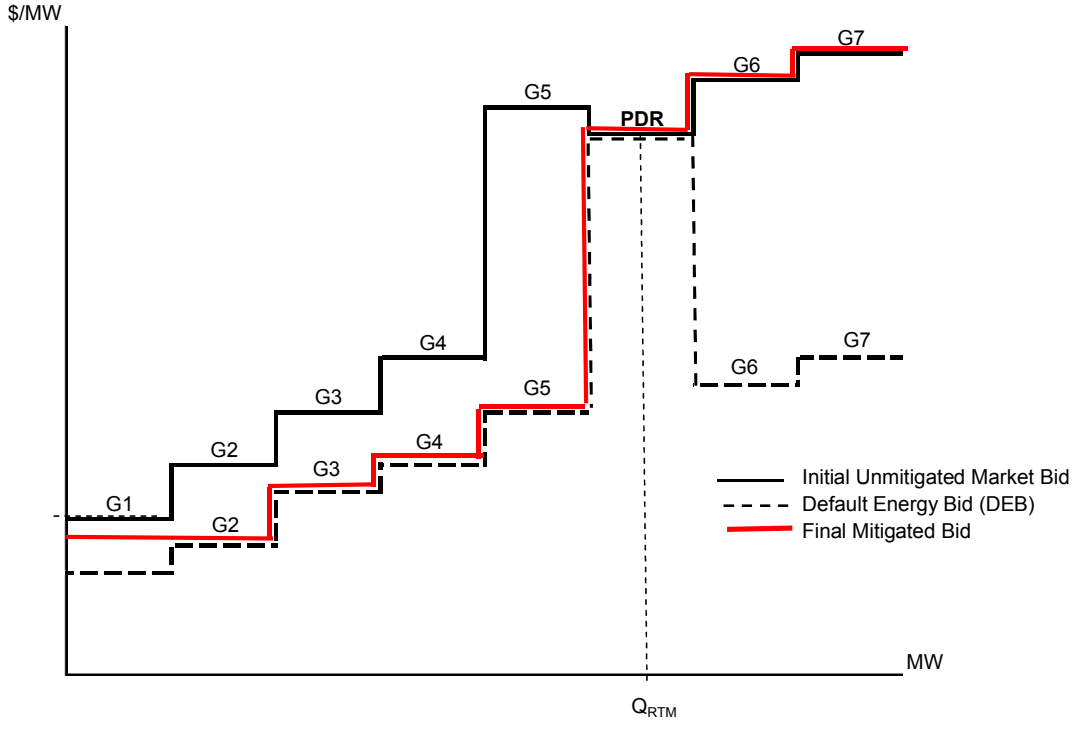


Figure 2. Real Time Market Outcome



Options for Mitigating Problem

DMM has identified several options for mitigating the scenario illustrated in Figures 1 and 2.

- **Option 1: Perform AC Run with Mitigated Bids.** One option is to perform the AC run on mitigated bids rather than market bids.[3] This option is the same as the approach that was recommended by DMM to address the ways in which convergence bidding could undermine LMPM (referred to as New Approach B in DMM's October 6, 2009 whitepaper illustrating this approach[4]). With this approach, under the scenario shown in Figures 1 and 2, Unit G6 would get dispatched in the AC run rather than the PDR resource, and Unit G6 would ultimately displace the PDR resource as the marginal unit dispatched in the RTM. However, if the PDR resource's bid was *lower* than the DEB of any of the units needed to meet demand in the AC run (G1 through G6), then the PDR would get dispatched and displace these units in the AC and RTM.

- **Option 2: Increase Load Forecast Used in AC Run.** With this approach, the load forecast used in the AC run would be increased by some level (e.g., 10 percent) with the goal of ensuring that enough additional generation is mitigated in load pockets where PDR is located to avoid the scenario in Figures 1 and 2.

- **Option 3: Run AC Without PDR Bids.** The effect of this approach is illustrated in Figures 3 and 4. As shown in Figures 3 and 4, this approach would result in the same outcome as the previous option of basing the AC run on DEBs. Under other scenarios, however, this approach could result in a significantly different dispatch than the previous option.

Initial Discussion of Options

- **Option 1: Perform AC Run with Mitigated Bids.** As discussed in DMM's previous whitepapers on this approach in the context of convergence bidding, DMM believes this approach represents a very elegant option that addresses the fundamental underlying problems caused by bids which cannot be subjected to the ISO's LMPM process using economically meaningful DEBs. In addition to effectively mitigating this problem, this approach is likely to increase overall market efficiency by ensuring that units within non-competitive load pockets tend to get dispatched more based on their true relatively economic merit order. However, in the convergence bidding stakeholder process, the ISO has indicated that this approach will only be considered for implementation sometime after implementation of convergence bidding in February 2011, and probably not until the start of the third year after MRTU go-live.

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[3] Mitigated bids would the developed in the same manner as they are currently, by taking the unit's DEB, but adjusting it if necessary so that the unit's highest bid dispatched in the CC run sets a "floor" or minimum level for the rest of the unit's bid curve.

[4] *Illustrative Examples of Alternative Local Market Power Mitigation*, Department of Market Monitoring, October 6, 2009. http://www.caiso.com/243f/243fce76bf30.pdf

- **Figure 3. HASP LMPM Runs Without PDR**

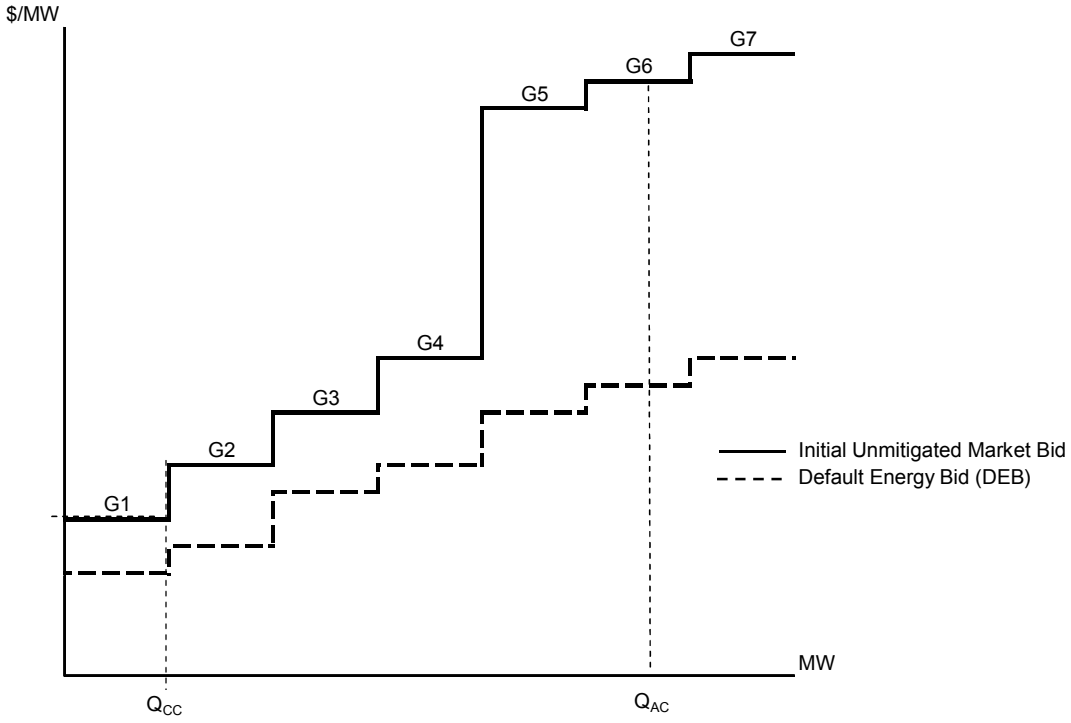

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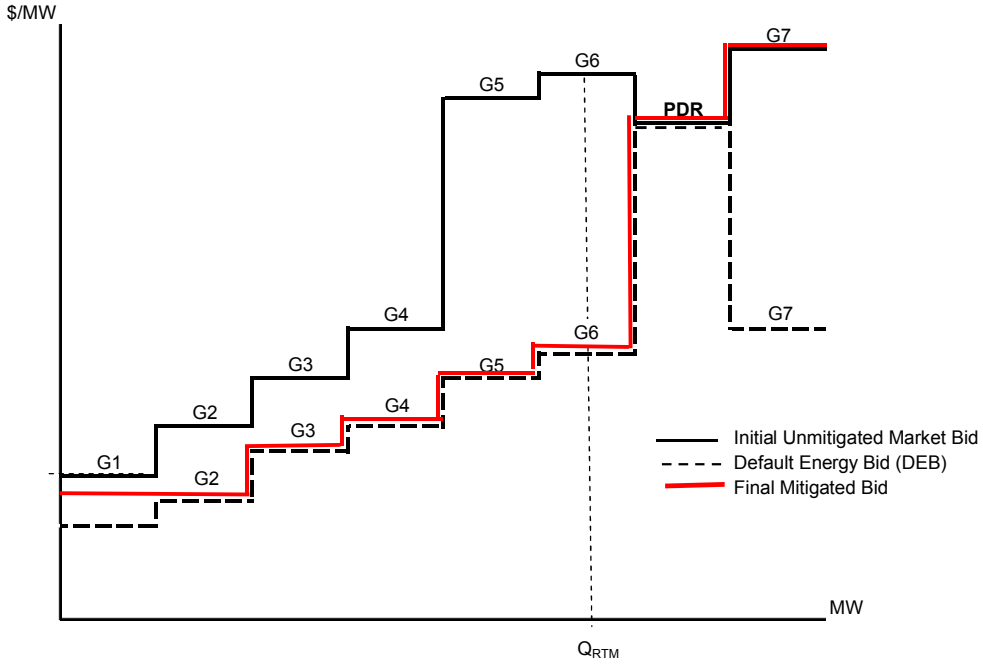
Figure 4. RTM Outcome (Without PDR in LMPM Runs)



- **Option 2: Increase Load Forecast Used in AC Run.** This option may represent a relatively "crude" tool for addressing the specific scenario in Figures 1 and 2, particularly if the increase in load forecast used in the AC was made on an overall system or LAP level. However, if the increase in load forecast was done on the level of the Custom Load Aggregation Points (CLAPs) in which PDRs were located (and the volume of the increase was comparable to the PDR in each CLAP), then this approach might have a similar result as Option 3.

- **Option 3: Run AC Without PDR Bids.** This approach appears to be a highly targeted way of addressing the scenario in Figures 1 and 2. With this approach, a PDR resource would be allowed to clear the market (and set LMPs) if its bid price was less than the mitigated bid price of the marginal generating resource available to meet demand in a load pocket constrained by uncompetitive paths. However, if the PDR resource's bid was higher than the mitigated bid of the marginal generating resource available to meet demand in a load pocket, the PDR resource would not be dispatched and set price. The implementation details of this approach would also appear to be less problematic than the other options.

Next Steps

DMM believes that Option 3 represents an effective short-term option for ensuring that PDR does not undermine the ISO's current LMPM provisions. Initial feedback from the ISO indicates that this approach may be relatively easy to implement in conjunction with PDR. DMM is requesting that this functionality be incorporated in the technical specifications for PDR, and may consider pursuing a tariff filing that would authorize implementation of this modification concurrently with implementation of PDR or as soon thereafter as possible.

Questions or comments on this issue may be raised on the PDR stakeholder call scheduled for December 8, 2009. Written comments on this issue may be submitted by December 15, 2009 to Eric Hildebrandt at ehildebrandt@caiso.com. Based on this input and further review of this issue, DMM may initiate further steps toward pursuing a tariff filing to effectuate this modification of LMPM rules for PDR resources.