

Memorandum

To: ISO Board of Governors
From: Eric Hildebrandt, Executive Director, Market Monitoring
Date: November 6, 2019
Re: Department of Market Monitoring update

This memorandum does not require Board action.

EXECUTIVE SUMMARY

This memo summarizes analysis by the Department of Market Monitoring (DMM) on the competitiveness of the ISO's day-ahead market and provides comments on the ISO's system market power initiative being discussed at the November 13 Board meeting.

Analysis by DMM indicates that in the last few years system market power has had a limited effect on market prices even during the limited number of hours when the ISO system was structurally uncompetitive. In 2019, market prices have continued to be relatively low and stable due to a combination of favorable market and system conditions. However, DMM continues to be concerned that market conditions in the coming years may change in ways that will exacerbate the potential for system-level market power.

The ISO is proposing to start a market design initiative on system level market power mitigation which would begin with development of system market power provisions in the real-time market. A second phase would consider extension of the mitigation mechanism to other areas of the Western EIM and to the day-ahead market. DMM supports the ISO's proposal to continue with an initiative to design system market power mitigation and looks forward to working with the ISO throughout that process. The approach outlined by the ISO will be an incremental improvement that would help to mitigate potentially uncompetitive system conditions.

DMM continues to recommend several other market design changes that may help mitigate system market power beyond the bid mitigation options being examined as part of the ISO's system market power initiative. These include consideration of options to increase the amount of resource adequacy imports clearing the day-ahead market in tight supply conditions or high load uncertainty. DMM also continues to recommend that the ISO's plan for implementing Order 831 include provisions to (1) ensure that import bids over \$1,000/MWh are subject to *ex ante* cost justification and (2) avoid setting penalty prices at \$2,000/MWh except when needed to implement the provisions of Order 831.

Analysis of market competitiveness

Analysis by DMM indicates that in the last few years, market power has had a very limited effect on system market prices even during hours when the ISO system was structurally uncompetitive based on the three pivotal supplier test used in the ISO's local market power mitigation procedure.¹ In 2019, market prices have continued to be relatively low and stable due to a combination of favorable market and system conditions including moderate natural gas prices, low load, high hydro production, and few major generation and transmission outages. With these favorable market conditions, the overall performance of the ISO energy market has remained highly competitive in 2019.

DMM assesses the potential impact of system market power by comparing actual market prices to competitive benchmark prices we estimate would result under highly competitive conditions. DMM estimates competitive baseline prices by re-simulating the market after replacing the energy market bids of all gas-fired units with the lower of their submitted energy bids or their default energy bids (DEB) that are used in bid mitigation. This methodology assumes competitive bidding of non-gas-fired resources and is calculated using DMM's version of the actual market software.

The difference between actual market prices and this competitive benchmark is referred to the *price-cost markup*. For the first three quarters of 2019, the average price-cost markup was about \$0.73/MWh or about 2 percent. This slight positive markup indicates that prices have been very competitive overall for the year.

The price-cost markup tends to be highest in the months and hours with the highest prices. As shown in Figure 1, the price-cost markup ranges from \$0.19/MWh in hour 4 to \$2.35/MWh in hour 20. As shown in Figure 2, monthly average values range from \$0.37/MWh in May to \$1.28/MWh in February.

DMM notes that the price-cost metric may be a conservative measure of system market power for several reasons. The only change in market inputs made in the competitive scenario is that energy bids of gas-fired resources are capped by each resource's default energy bid -- which includes a 10% adder above estimated marginal costs. All other bids are assumed to be competitive, including those of non-resource specific imports. Also, this analysis does not change commitment cost bids for non-gas or gas-fired resources which are capped at 125% of each resources estimated start-up and minimum load costs. DMM is working to develop the capability to assess the potential impact of these market bids on overall system prices using the ISO's day-ahead market software.

¹ 2018 Annual Report, Department of Market Monitoring, June 2018, pp. 154-157.
<http://www.caiso.com/Documents/2018AnnualReportonMarketIssuesandPerformance.pdf>
2017 Annual Report, Department of Market Monitoring, June 2017, pp. 1,2 and 153.
<http://www.caiso.com/Documents/2017AnnualReportonMarketIssuesandPerformance.pdf>

Figure 1. Day-ahead market price cost markup by hour of day (January – September 2019)

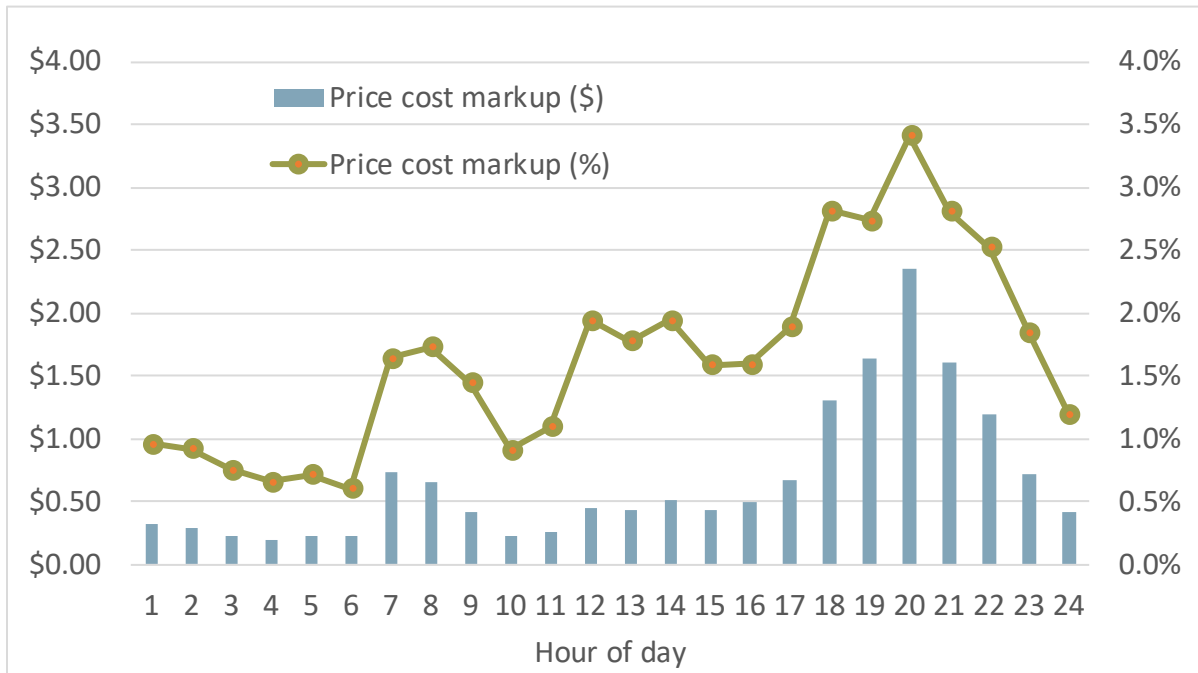
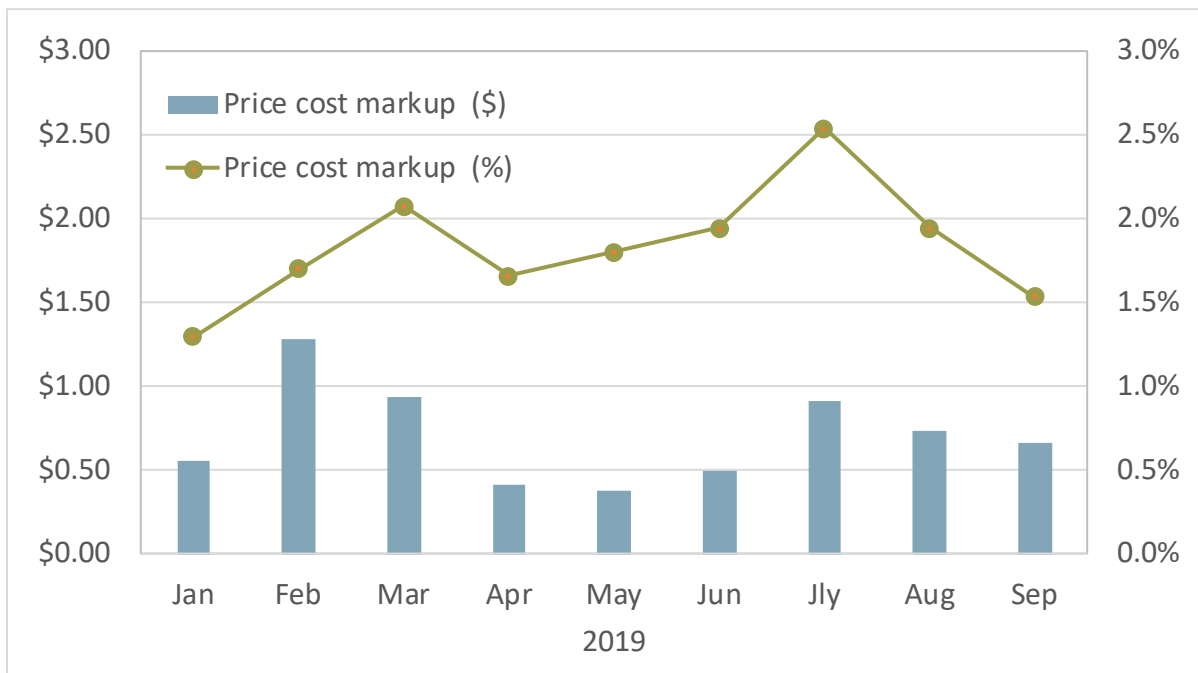


Figure 2. Day-ahead market price cost markup by month (January – September 2019)



Potential for increased system market power

In the last few years, market power has had a very limited effect on system market prices even during hours when the ISO system was structurally uncompetitive based on the three pivotal supplier test used in the ISO's local market power mitigation procedures. However, DMM has expressed concern that market conditions may evolve in a way that will increase the potential for system-level market power. Changes and trends that may increase the potential for system market power in the coming years include:

- Retirement and mothballing of gas capacity.
- Increasing portion of resource adequacy requirements being met by solar and wind resources, which often provide significantly less energy during the evening ramping hours than the resource adequacy rating of these resources.
- Fewer energy tolling contracts between gas units within the ISO and load serving entities without an incentive to exercise market power.
- Increasing portion of resource adequacy requirements met by imports not backed by energy contracts or physical resources, which can avoid being called upon by simply bidding at high prices in the day-ahead market.
- Tightening regional supply conditions.

The ISO's comments in the CPUC's Integrated Resource Planning Proceeding indicate that ISO planners also have significant concerns about many of these same issues, and that the supply/demand balance in the ISO system may tighten to the point where system reliability is in jeopardy as soon as summer 2021.²

The ISO's comments in the CPUC proceedings emphasize the threat to reliability posed by these trends. However, as illustrated in DMM's comments submitted in the ISO's system market power initiative, for each hour tight supply/demand conditions may pose a threat to reliability due to a shortage of supply, there are many more hours in which tight supply/demand conditions create the potential for market power when there is no actual shortage of supply to meet demand.³ This suggests that there is the potential for reliability issues and market power within the next few years.

Given these trends and concerns, DMM believes it is prudent for the ISO to continue to consider and develop options for system market power mitigation. DMM appreciates the challenges and complexity involved in developing such options. Some options – such as

² *Comments of the California Independent System Operator*, Rulemaking 16-02-007, July 22, 2019, pp.4, 14-15. <http://www.caiso.com/Documents/Jul22-2019-Comments-PotentialReliabilityIssues-R16-02-007.pdf>

³ *Comments on July 15, 2019 System Market Power Working Group Meeting*, Department of Market Monitoring August 5, 2019, pp. 3-6. <http://www.caiso.com/Documents/DMMComments-SystemMarketPower-Jul152019.pdf>

extending mitigation to resource adequacy imports – may require changes or coordination with CPUC resource adequacy rules. Since developing and implementing effective options may require significant time and review by stakeholders, DMM believes the ISO should continue the process of considering system market power mitigation options which could be implemented in a timely manner in the event the ISO market becomes less structurally competitive.

ISO's system market power initiative

The ISO is proposing to start a market design initiative on system market power mitigation. In the first phase, the ISO would consider development of system market power provisions in the real-time market only. This mitigation would be designed largely as an extension of local market power mitigation provisions already in place within the ISO. Under this approach, system level bid mitigation of resources within the ISO would be triggered when import congestion occurred on major interties and the ISO system was structurally uncompetitive based on the *three pivotal supplier test*. A second phase would consider extension of the mitigation mechanism to other balancing authority areas within the Western EIM and to the day-ahead market.

DMM supports the ISO's proposal to continue with an initiative to design system-level market power mitigation and looks forward to working with the ISO throughout that process. The approach outlined by the ISO will be an incremental improvement that would help to mitigate potentially uncompetitive ISO system conditions.

Applying system market power mitigation when major interties are binding, as currently contemplated by the ISO, will be an incremental improvement that would help to mitigate potentially uncompetitive ISO system conditions. However, DMM believes that this approach may not capture all instances of potentially uncompetitive system conditions under which system market power could be exercised given limits on access to transmission needed to schedule energy to the ISO and other limitations on import supplies. DMM also continues to recommend that the ISO consider approaches that would extend system market power mitigation to resource adequacy imports.

The ISO proposes initially to impose system level market power mitigation only in the real-time market. DMM supports this as an incremental improvement, but encourages the ISO to continue thinking through the potential for unintended consequences when only mitigating the real-time market and for mitigation in the day-ahead market. As noted by the MSC, the "application of market power mitigation only in real-time may not constrain the exercise of market power as tightly as if it were also applied in the integrated forward market as well, and there are some risks of unintended consequences of applying this mitigation only to real-time, and not in the day-ahead market."⁴ However, DMM agrees with the

⁴ *Opinion on System Market Power Mitigation*, Market Surveillance Committee of the California ISO, November 5, 2019, p.4. http://www.caiso.com/Documents/MS-C-DraftOpiniononSystemMarketPowerMitigation-Nov5_2019.pdf

MSC that “these risks appear to be outweighed by the advantages of starting by applying system market power mitigation only in the real-time market.”

If the ISO pursues system-level market power mitigation, DMM has also recommended that the ISO should also consider modifications to the competitive locational marginal price (LMP) used in local market power mitigation.⁵ The current process for determining the competitive LMP implicitly assumes a competitive system price. This assumption is not valid in the presence of system-level market power and any approach for system-level market power mitigation should allow for a revised calculation of the competitive LMP to reflect the mitigated system price when appropriate.

Other market design issues

DMM’s past recommendations relating to system market power include several market design issues that go beyond the bid mitigation options being examined as part of the ISO’s system market power initiatives.

Given the increasing role that resource adequacy imports may play in ISO system reliability and market competitiveness, DMM has recommended consideration of options that would increase the supply and availability of energy from RA imports beyond the day-ahead market into real-time. Options might include mechanisms to increase the amount of RA imports clearing the day-ahead market in tight supply conditions or high load uncertainty.

Such options likely involve a combination of RA rules for imports established by the CPUC as well as ISO market rules. In the ISO’s *Resource Adequacy Enhancements Second Revised Straw Proposal*, the ISO is proposing to require specification of the source balancing area for all RA imports. However, the ISO is no longer considering extension of the RA must-offer requirement beyond the day-ahead market.

DMM has also recommended that under the ISO’s plan for implementing Order 831, the ISO should (1) ensure that import bids over \$1,000/MWh are subject to *ex ante* cost justification and (2) avoid setting penalty prices at \$2,000/MWh except when needed to implement the provisions of Order 831. These market design features have important implications in terms of mitigating potential system market power. The ISO has committed to consider these potential design rules in a future stakeholder initiative, but has proceeded to submit a compliance filing on Order 831 that does not include these elements.⁶

⁵ *Comments on July 15, 2019 System Market Power Working Group Meeting*, p.6.

⁶ *Motion to Intervene and Comments of the Department of Market Monitoring*, Docket No. ER19-2757-000, September 26, 2019.

<http://www.caiso.com/Documents/MotiontoInterveneandCommentsoftheDepartmentofMarketMonitoringonOrder831Compliance-ER19-2757-Sept262019.pdf>