



PJM's Comments regarding the 2007 State of the Market Report Issued by the PJM Market Monitoring Unit

Introduction and Purpose

On March 11, 2008 the PJM Market Monitoring Unit (MMU) released its 2007 State of the Market Report (SOM Report).¹ Overall, the MMU concluded the results of PJM's Markets were competitive during 2007 with the exception of the regulation market in which no conclusions were reached by the MMU regarding competitiveness.

PJM is committed to the creation and operation of robust competitive wholesale electricity markets. The operation of the competitive market provides substantial benefits to customers and is integral to reliable grid operation. PJM concurs with the MMU's overall observations as to the competitiveness of the various PJM markets. PJM is committed to working with the MMU to ensure that PJM markets are free from undue influence and remains committed to robust market monitoring procedures and market power mitigation rules in fostering competitiveness and open access.

The 2007 State of the Market Report examines the structure of the markets and structural market power characteristics in great detail. It would be helpful to put in perspective issues concerning structural market power to avoid any erroneous conclusion that the design of PJM Markets results in structurally non-competitive markets and the potential exercise of market power. It is clear in the context of the complete 2007 SOM report that the market results are not driven by the exercise of market power. PJM hopes this paper will provide additional context as part of a constructive dialogue concerning the issues and the conclusions set forth in the SOM Report, as well as a broader discussion of market power issues in general.

PJM's comments address three major points of emphasis:

1. Elaborate on, and reinforce, the conclusions reached by the MMU in the SOM Report that the results of the PJM Markets were competitive;
2. Emphasize, in concert with the MMU, PJM's continued commitment to robust market mitigation policies that prevent the exercise of market power, and ensure competitive market outcomes; and
3. Provide PJM's perspective regarding structural market power, market power mitigation, changes in fuel-cost-adjusted LMP over time, and price-cost mark-up provided in the SOM Report.

With respect to structural market power, PJM points out that a structurally non-competitive market reflects a tight supply-demand balance, and/or a high supply-side ownership concentration. If suppliers are deemed to possess structural market power the PJM Market Design offer caps resources at their marginal or incremental cost to prevent the exercise of market power. Moreover, to the extent that PJM can address or affect drivers of supply-demand balance, the PJM Market

¹ 2007 State of the Market Report, Volume 2: Detailed Analysis at <http://www2.pjm.com/markets/market-monitor/downloads/mmu-reports/2007-som-volume2.pdf>



Design works to address those drivers to ensure markets are as structurally competitive as possible. The RPM Capacity Market's structurally non-competitive characteristics are largely a result of supply-demand drivers beyond PJM's control, but the offer capping of resources has ensured the results of the RPM Capacity Market are competitive.

Regarding fuel-cost-adjusted LMP, PJM points out the increase from 2006 to 2007 is due to the tightening of the supply-demand balance, which dominated the slight decrease in fuel costs from 2006 to 2007. PJM believes fuel-cost-adjusted LMP using a common base year for fuel costs would facilitate a comparative analysis of market performance over the life of PJM's Energy Market and separate out price changes due to fuel cost from other aspects of market performance.

Price-cost mark-up is employed as a measure of market power or the intent to exercise market power. PJM points out that prices during high load events,² where price is greater than marginal cost, are consistent with scarcity pricing and are an important component of the weighted average mark-up. Moreover, marginal costs submitted to PJM, reviewed by the MMU, and used in the price-cost mark-up analysis generally omit opportunity costs related to the existence of shut-down or start-up decisions/costs, and the existence of run-time or number of start restrictions which could lead to an inaccurate measurement of the price-cost mark-up. PJM is of the opinion that analyzing the LMP impacts of price-cost mark-ups requires a hypothetical re-dispatch of the market under the presumption that all units offer their marginal cost to derive the new LMP value.

Finally, with respect to the Regulation Market, PJM notes that in spite of a finding of structural market power the cleared offer prices rarely exceed \$20/MWh even in the absence of a must offer requirement when suppliers could push prices to the \$100/MWh offer cap.

PJM Remains Committed to Robust Market Mitigation Policies

In the SOM Report the MMU recommends the retention and/or application of the Three Pivotal Supplier Test (TPST) or other market power screens to determine when markets are structurally non-competitive.³ Moreover, to prevent the exercise of market power when there is a finding of structurally non-competitive markets, the MMU recommends continuing the offer capping of units at their marginal cost. The markets where the TPST and/or offer capping based on marginal or incremental cost are in effect are:⁴

1. The Day-Ahead and Real-Time Energy Markets;
2. The Synchronized Reserve Markets; and
3. The RPM Capacity Markets.

Additionally, the MMU recommends extension of the TPST and offer capping to the Regulation Market, and to the four exempt transmission constraints in the Energy Markets, and to all

² A high load event occurs when hourly demand plus operating reserve targets exceed 90 percent of the available capacity. *Id.* at 155, footnote 67.

³ *Id.* at 2.

⁴ TPST is not used to trigger offer capping in the Synchronized Reserve Market. Offers are always subject to offer caps of cost plus \$7.50/MWh. See PJM OATT, Attachment K-Appendix, Section 1.10.1A (j).



generating units that are currently exempt from market mitigation rules.⁵ PJM has provided responsive comments to all of the MMU recommendations at the end of this document.

PJM agrees with the MMU that there is a continuing need for robust market mitigation rules to prevent the exercise of market power and ensure competitive outcomes in PJM's Markets. Additionally, PJM agrees with the MMU that market power mitigation rules be balanced with the need for markets to achieve competitive pricing that reflects scarcity when it is present, reflects locational prices differences when transmission constraints are present, and provides efficient forward price signals for capacity without generators resorting to the exercise of market power.

The current market power mitigation strategy automatically mitigates supply offers when the three pivotal supplier test determines suppliers possess structural market power (suppliers have the *ability* to exercise market power by raising prices above competitive levels) regardless of the *incentive* to exercise market power, even if they do not have the incentive to raise prices above competitive levels such as when a supplier may be a net purchaser. Consequently, when suppliers are deemed to possess structural market power within the PJM Market Design, mitigation measures are implemented that prevent the exercise of market power. PJM is also working with stakeholders through the Three Pivotal Supplier Task Force to find ways to ensure that no market is excessively mitigated during scarcity conditions which would tend to distort efficient forward price signals and may have reliability consequences.

A Structurally Non-competitive Market is Indicative of a Market with a Tight Supply-Demand Balance and/or High Concentration of Ownership in Supply

Throughout the SOM Report, the MMU discusses situations where a market is *structurally non-competitive* or *structurally competitive*, or that suppliers possess *structural market power*. A market that is structurally non-competitive, or in which suppliers possess structural market power, is only indicative that the supply-demand balance is tight (there is relatively little excess supply remaining after demand has been satisfied), or there is a high concentration of ownership in supply (available supply is in the hands of relatively few owners).⁶ The tight supply-demand balance or high ownership concentration gives suppliers the *ability* to raise prices above competitive levels. It is essential to note that a structurally non-competitive market *does not* indicate that suppliers have the incentive to raise prices, or have actually raised prices above competitive levels.⁷ Consequently, a finding of structural market power does not end the market power analysis, but requires a further examination of bidding behavior on the part of suppliers which the MMU has done throughout the SOM Report.

⁵ 2007 State of the Market Report, Volume 2: Detailed Analysis at 4.

⁶ The MMU discussion of market structure addresses supply, demand, and supply ownership concentration. Id at 13-18.

⁷ According to the MMU the benchmark for competitive pricing is the marginal cost of providing one more unit of service. Id. at 33-34.



The MMU determination of the structural competitiveness of a market is largely based upon the results of the Three Pivotal Supplier Test (TPST).⁸ The TPST calculates whether three suppliers (by ownership) are “pivotal” to satisfying demand in the market. That is, if a group of three suppliers is removed from the market, and the remaining suppliers cannot satisfy the demand, then the group of three suppliers is considered “pivotal,” the market is considered structurally non-competitive, and all suppliers failing the TPST are considered to possess structural market power. Conversely, if there is no group of three suppliers that is “pivotal”, then the market is considered structurally competitive. One potential indication of a finding of structural market power by the TPST is there is very little excess supply remaining after demand has been satisfied (a tight supply-demand balance).

To show how the overall supply-demand balance can affect the structural competitiveness of a market, consider an example market (energy, ancillary services or capacity) where there are ten suppliers each with a supply potential of 10 MW. This results in a supply potential of 100 MW. Suppose the demand for the product in question is 50 MW. If any three of the suppliers is removed from the market, there remains 70 MW of supply potential to serve the 50 MW of demand. The TPST would determine that this market is structurally competitive as there is ample excess supply (50 MW) available after satisfying demand.

With a supply potential at 100 MW from ten suppliers each with 10 MW, what happens if demand increases to 80 MW? Taking any three suppliers from the market leaves only 70 MW of supply potential to satisfy 80 MW of demand. Because there is not enough supply available to serve the demand absent the three suppliers (there is only an excess supply of 20 MW after demand is satisfied), the TPST would determine the market to be structurally uncompetitive. In this case, the only difference between the structural competitiveness and structural non-competitiveness of the market was the change in the demand-side of the supply-demand balance.

The other potential indication a finding of structural market power is an increasing or high supply-side ownership concentration. In real-time market operation, supply ownership concentration can increase when a transmission constraint binds, reducing the amount of available supply by a more dispersed ownership. One can view this as a tightening of the supply-demand balance, even though there still may be plentiful excess supply after the constraint binds. Suppose there are six suppliers each with 5 MW of supply potential, three suppliers with 10 MW of supply potential, and two suppliers with 20 MW of supply potential for a total of 100 MW of supply potential, and a demand of 30 MW. This market would be determined to be structurally competitive by the TPST. However, if there is a binding transmission constraint that removes the six suppliers with only 5 MW each entirely from the local market (increasing supply-side concentration), there are only five suppliers remaining with 70 MW of potential supply available to satisfy a demand of 30 MW. Taking the top three suppliers out of market (20 MW, 20 MW, and 10 MW) leaves only 20 MW of supply potential remaining to serve the 30 MW of demand, thus the TPST would determine the transmission-constrained market to be structurally uncompetitive. In this case there is more than twice the available supply to satisfy demand, yet there is a tightening of the supply-demand

⁸ This is true in the PJM Energy Markets, the Synchronous Reserve Market, and the RPM Capacity Market. The MMU also uses other screens for the RPM Capacity Market including the HHI index of market concentration, and the market shares of individual generation owners. Id at 249-251.



balance (30 MW of supply potential is taken out of the market) that has led to an increase in concentration. Changes to the available supply-side resources have driven the increase in supplier concentration to shift the market from being structurally competitive to structurally non-competitive.

The above examples provide useful guidance on how the supply-demand balance or ownership concentration affects the structural competitiveness of markets. It is also helpful to understand the drivers behind the supply-demand balance and ownership concentration, where PJM can influence these drivers through market design, and where PJM has little or no control over those drivers of supply-demand balance and ownership concentration.

PJM Market Design Can Influence some Drivers of Supply-Demand Balance

Market design can aid in changing the market structure to reduce the instances where structural market power is present. One driver of market structure is the ability of demand to respond to price in the PJM Energy Markets. PJM's implementation of load response programs can help change the supply-demand balance by encouraging greater price responsiveness of demand in the day-ahead or real-time energy markets.⁹ Another driver of market structure is the ability of demand-side resources to participate as a supply-side resource in ancillary service markets, as capacity resources in RPM, or as a reliability resource as Interruptible Load for Reliability (ILR). Within the PJM Market Design, demand-side resources are allowed to offer supply into each of these markets, which alleviates potentially tight supply-demand balances.

On the supply side, the RPM Capacity Market works in tandem with the PJM Energy Markets to send forward price signals to potential generation investors, to existing generators that may potentially be retired, to owners of capacity in areas external to PJM that may wish to import capacity into PJM, and to potential demand-side resources to bring increased supply into the market. Moreover, because there is the possibility of differing capacity prices in addition to energy prices by location, those areas that may be susceptible to instances of structural market power due to transmission constraints should observe greater incentives to site new supply capacity in transmission constrained areas. If potential new suppliers receive a signal from the combined RPM Capacity Market and Energy Markets that they can recover their going forward costs inclusive of necessary returns on investment, then new suppliers will come forward and offer capacity to the market.

According to the MMU's calculations in the SOM Report for 2007 (the first year in which generators have collected RPM Capacity Market revenues) potential investors in combined cycle natural gas or combustion turbines in some of PJM's transmission constrained eastern load zones are able to recover going forward costs in 2007 for the first time since 1999.¹⁰ Through the first four base

⁹ For the amount of demand response to date, please see "Analysis of Economic Load Response Data" presented to the Demand Response Steering Committee on April 4, 2008 and found at <http://www.pjm.com/committees/drsc/downloads/20080404-item-03-analysis-of-economic-load-response-data.pdf>

¹⁰ For combustion turbines see SOM Report at 135-136 Tables 3-23 and 3-24. For combined cycle facilities see SOM Report at 138-139, Tables 3-25 and 3-26.



residual auctions in RPM as of January 2008, PJM estimates a net increase of approximately 10,000 MW of capacity that would not have been in the market absent RPM.¹¹

Drivers of Supply-Demand Balance and Supply Ownership Concentration outside PJM's Control

While PJM can adjust its market design to better incorporate demand-side resources or to encourage new supply-side resources, thereby improving the supply-demand balance and reducing instances of structural market power, there are many drivers of supply-demand balance and supply ownership concentration that are beyond PJM's control. For example, PJM has within its purview improved demand-side response mechanisms, enhanced demand-side participation, and appropriate scarcity pricing in its Energy Markets, Regulation Market, or Synchronized Reserve Market to moderate the effects the weather, the season, or the time of day which are beyond PJM's control

Other aspects affecting demand response such as state-level policies on retail pricing and advanced metering infrastructure (AMI) deployment are the purview of state regulators and not PJM. Demand growth driven by overall economic growth is further outside of PJM's control, although long-term demand growth will have impacts on PJM's Energy Markets and the RPM Capacity Market.

PJM cannot vary the application of North American Electric Reliability Council (NERC), Reliability First Corporation (RFC), and other reliability standards which may drive demand in some markets. PJM's Regulation Market demand is given as one percent of the daily forecast system peak load.¹² Synchronized Reserve demand is dictated by reliability requirements as well.¹³ Demand in the RPM Capacity Market is driven by the required reserve margin that must be maintained by PJM for reliability.¹⁴ The inflexibility of demand as dictated by reliability requirements can more easily lead to instances of structural market power.

Historical patterns of generation and transmission investment prior to the inception of the PJM Market are an artifact of vertically integrated, regulated utilities as they existed prior to electricity market reforms. The extent to which ownership structures have carried over from the vertically integrated, regulated paradigm into the PJM Market can easily drive determinations of structural market power, rather than PJM's Market Design. Additionally, state policy within the PJM footprint that may have ordered divestiture of supply resources or allowed supply resources to be sold off to non-regulated entities also affects ownership concentration, and is also outside of PJM's control.

With many elements driving the supply-demand balance and ownership concentration being both outside of PJM's control and ability to address through market design, market power mitigation is necessary to guard against potential exercises of market power.

¹¹ See news release "PJM Reliability Pricing Model Auction Draws Largest Amount of New Capacity So Far" at <http://www.pjm.com/contributions/news-releases/2008/20080201-jan-08-rpm-auction-results.pdf>

¹² See PJM Manual 11: Scheduling Operations Revision 32, Effective September 28, 2007 at 34.

¹³ Id. at 41-42.

¹⁴ See PJM Manual 18: PJM Capacity Market Revision 1, Effective 02/03/2008 at 15.



Market Power Mitigation in PJM's Market Design Ensures Structural Market Power Does Not Result in an Exercise of Market Power

Within the PJM Market Design, suppliers in the PJM Energy Markets, and the RPM Capacity Market who fail the TPST (suppliers possess structural market power or a market is structurally non-competitive) are subject to market power mitigation requiring their offers into the market to be capped at the marginal or incremental cost of the supplier.¹⁵ Moreover, within the PJM Energy Markets and the RPM Capacity Market there is a "must-offer" requirement that prevents physical withholding of supply from the market. Consequently, a determination of structural market power does not result in an exercise of market power within the PJM Market Design. The mitigation strategy caps the offers of suppliers with the *ability* to exercise market power (raise prices above competitive levels) regardless of the *incentive* to do so, even if suppliers do not have the incentive to raise prices above competitive levels.

When might a supplier have little or no incentive to raise prices above competitive levels? Consider a generator owner that is also a load-serving entity (LSE), and thus implicitly or explicitly already has a contractual obligation to serve load. Assume that the generator owner/LSE is deemed to have structural market power, but the LSE's load obligations exceed generator capacity by 100 MW. In this case the generator owner/LSE has no incentive to raise price above competitive levels because doing so would increase the generator/LSE cost of serving the remaining 100 MW load obligation. If anything, the generator owner/LSE has an incentive to keep the market price at competitive levels or possibly drive prices below competitive levels.¹⁶ In short, the net load obligation of a combined generator/LSE may provide incentives to keep prices down rather than raising them even when the generator/LSE owner has the ability to raise prices. Still, the PJM Market Design offer caps to ensure market power is not exercised.

Mitigation in PJM's Market Design Ensures Structural Market Power does not Lead to an Exercise of Market Power in the RPM Capacity Market

In its analysis of the RPM Capacity Market, the MMU concludes structural market power and the potential for the exercise of market power remain present in the RPM Capacity Market. The MMU cites inelastic demand resulting from an administratively determined reliability requirement and the requirement of all LSEs to participate in the market, as well as generally tight supply-demand conditions which are endemic to any capacity market structure and not unique to the RPM Capacity Market.¹⁷ The existence of structural market power in the RPM Capacity market should not be surprising. With demand as an administratively determined reliability requirement, there is

¹⁵ The exception to this is for 56 generating units exempt from market power mitigation in the PJM Energy Markets. See 110 FERC ¶ 61, 053 (2005) and 112 FERC ¶ 61, 031 (2005), and the discussion in 2007 State of the Market Report, Volume 2: Detailed Analysis at 39.

¹⁶ Examples of the economic literature showing how contracting financially or physically with load reduces the incentive to raise prices in electricity markets see Frank A. Wolak, "An Empirical Analysis of the Impact of Hedge Contracts on Bidding Behavior in a Competitive Electricity Market," *International Economic Journal*, Volume 14, Number 2, Summer 2000; Erin T. Mansur, "Upstream Competition and Vertical Integration in Electricity Markets," *Journal of Law & Economics*, Volume 50 pp. 125-156; and James B. Bushnell, Erin T. Mansur, and Celeste Saravia, "Vertical Arrangements, Market Structure, and Competition: An Analysis of Restructured U.S. Electricity Markets," Center for the Study of Electricity Markets Working Paper 126R, February 2005.

¹⁷ 2007 State of the Market Report, Volume 2: Detailed Analysis at 232-233.



no incentive for generation owners to build more capacity than required, as that excess capacity would not receive compensation in most capacity market constructs. Consequently, there is likely to be little or no excess supply after demand is satisfied resulting in an extremely tight supply-demand balance.¹⁸ PJM agrees with the MMU that structural problems are endemic to all capacity markets and the RPM Capacity Market is no exception.

Yet in spite of the structural issues, the MMU found the results of the RPM Market to be competitive and found no exercise of market power. As has been discussed previously, the PJM Market Design calls for offers to be capped at avoided cost less projected revenues if suppliers in the RPM Capacity Market are determined to possess structural market power, preventing the exercise of market power. In the first three base residual auctions all suppliers were subject to offer capping with just under half of all offers coming in at prices of zero with the remaining offers at capped values.¹⁹ Moreover, the PJM RPM Capacity Market Design incorporates a price responsive (elastic) demand curve for capacity to reduce the ability of suppliers to raise prices under such tight supply-demand conditions, and to also provide compensation to excess supply, which in turn can also drive down prices, recognizing that excess supply does provide some reliability value. PJM believes the MMU's conclusion with respect to the RPM Capacity Market provides further evidence that the presence of a non-competitive market structure does not result in an exercise of market power in the context of the PJM Market Design.

Higher Load-Weighted Average LMP in 2007 is a Result of a Tighter Supply-Demand Balance

The MMU reports the load weighted average LMP increased 15.6 percent from 2006 to 2007.²⁰ This increase occurred while overall fuel costs decreased from 2006 to 2007. The fuel-cost-adjusted, load-weighted LMP increased by over 18 percent in 2007, using 2006 prices.²¹ The increase in LMP can be attributed to tighter supply-demand conditions prevalent in the energy market in 2007. The available supply resources decreased 0.5 percent in 2007,²² while demand on average rose 2.8 percent in 2007.²³ In short, with demand increasing and supply resources remaining approximately the same as the year before, on average the energy market is clearing further up the supply curve which should result in higher LMPs. The reduction in fuel costs from 2006 to 2007 helped to mitigate the LMP increase from 2006 to 2007 as the LMP increase would have been greater had fuel prices remained at their 2006 levels.

Figure 1 provides a graphical example of the change in weighted average LMP between 2006 and 2007. The demand and supply in 2006 are represented by the solid lines and marked respectively as D_{2006} and S_{2006} , with the resulting price of P_{2006} . The decrease in fuel costs can be represented by the shift in supply down and to the right from S_{2006} to S_{2007} . Had demand stayed at 2006 levels the realized prices in 2007 would have been lower as represented by P_{low} . In 2007 demand increased as represented by D_{2007} . The matching of demand and supply in 2007 results in the

¹⁸ Id. at 232-233.

¹⁹ Id. at 230-231.

²⁰ Id. at 57. See Table 2-52.

²¹ Id. at 61. See Table 2-55.

²² Id. at 14.

²³ Id. at 46. See Table 2-43.



higher price in 2007 P_{2007} . However, if fuel prices had not fallen from 2006 to 2007, but demand had increased, the resulting price would have been where S_{2006} matched D_{2007} in Figure 1 with the price being P_{high} .

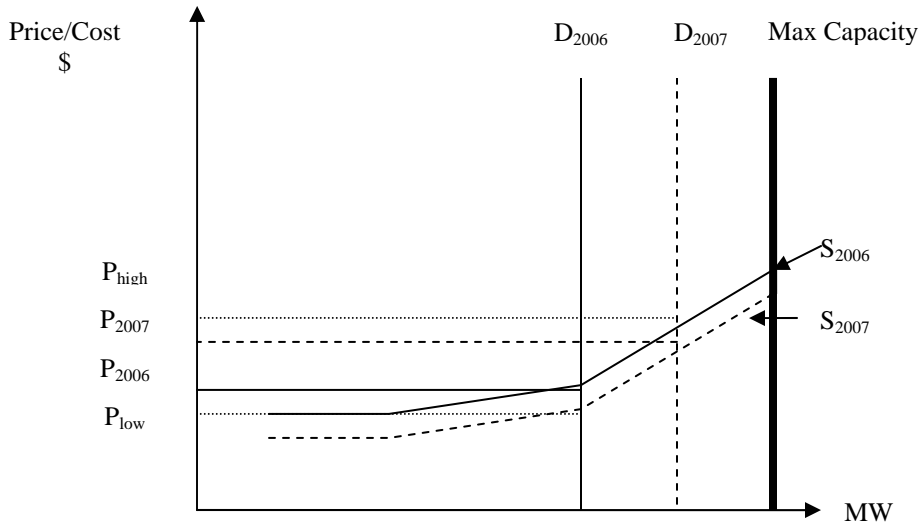


Figure 1: Increase in Demand Dominates Decrease in Fuel Cost

Fuel-Cost-Adjusted LMP is a Benchmark of Energy Market Performance and Conditions over Time

To compare LMPs from one year to the next while accounting for the variation in fuel and emissions allowance prices, the MMU computes a fuel-cost-adjusted LMP. The computation of fuel-cost-adjusted LMP requires a base year be chosen so that fuel prices will be common across all years being compared.²⁴ As PJM has previously cited in these comments, the fuel-adjusted, load-weighted LMP increased by over 18 percent in 2007 using 2006 prices, which means 2006 is the base year used for comparison.²⁵ Figure 1 provides a graphical representation of the fuel-cost-adjusted LMP for 2007 using 2006 prices. As previously discussed, had 2006 fuel prices been in place in 2007, the price in the market would have been P_{high} in Figure 1 where S_{2006} intersects D_{2007} . PJM supports the MMU's use of fuel-cost-adjusted LMP as a comparison of market performance and conditions from one year to the next. As PJM has discussed above, the fuel-cost-adjusted LMP change from 2006 to 2007 indicates that the tightening of the supply-demand balance dominated a slight decrease in fuel costs.

For comparison of fuel-cost-adjusted LMP across multiple years, the MMU uses what it calls the year-over-year method. Tables C-6 and C-7 of the SOM Report provide an example comparing the years 2005 through 2007.²⁶ Fuel prices in 2005 provide the base year by which the 2006 fuel-cost-adjusted LMP method is calculated. The 2007 fuel-cost-adjusted LMP is calculated using 2006 as

²⁴ The MMU also includes the cost of emissions allowances in the calculation of fuel-cost-adjusted LMP.

²⁵ Id. at 61. See Table 2-55.

²⁶ Id. at 417.



the base year. The year-over-year method used by the MMU does not allow a direct comparison of 2005 LMP to 2007 LMP using a common base year. PJM believes that market performance and evolving market conditions must be evaluated over a number of years as well as from one year to the next, and that the only way to make direct comparisons is to employ a common base year.

The evolution of the PJM Markets offers an opportunity for a direct comparison of LMP over the life of the PJM Market. During the period from April 1, 1998 until March 31, 1999 PJM operated under a cost-based LMP Energy Market.²⁷ PJM encourages the MMU to use fuel and allowance prices from this time period as the common base operating year by which market performance can be compared from one operating year to the next, as well as comparing performance across non-consecutive operating years. Such an analysis would result in a natural comparison to a cost-based market, which serves as the perfectly competitive benchmark. That is a benchmark upon which PJM's market power mitigation strategy, which is supported by the MMU, is based. PJM believes the comparison to a cost-based market employing prices from a time period in which many restructuring policy decisions were made would show the efficiency gains facilitated by wholesale competition and highlight the role of rising fuel costs as the main driver behind increasing wholesale power prices.

The Price-Cost Mark-up provides a General Measure of Market Behavior in the Outside of Scarcity Pricing Events

The MMU states that the mark-up of the realized price in a market over the short-run marginal cost of providing one more MW to market by marginal units is a measure of market power.²⁸ For units that do not set the price but are providing energy to the market, the mark-up of the bid offer over the marginal cost is a measure of the intent to exercise market power by that unit.²⁹ Within the SOM Report the use of the term *competitive price levels* in any market is the same as saying *competitive prices* should be equal to the short-run marginal cost of supplying one more MW to the market. And by extension, *competitive bidding behavior* means that suppliers bid offers are equal to their short-run marginal costs³⁰.

While price equal to marginal cost provides a general benchmark for determining the competitiveness of markets, it is not a definitive measure of the exercise of market power as prices in excess of marginal cost caused by scarcity conditions do not constitute an exercise of market power. The MMU has recognized scarcity pricing in computing price-cost mark-ups by excluding the scarcity event hours from 2007, and breaking out the component of price-cost mark-up attributable to appropriate scarcity pricing.³¹

²⁷ Id. at 409. The MMU provides a list of PJM Milestones in Appendix B of the SOM Report.

²⁸ Id. at 33. The price cost mark-up is computed at $\frac{P - MC}{P}$ where P is the price and MC is the marginal cost.

²⁹ Id. at 33.

³⁰ In this section, from this point on marginal cost is synonymous with short-run marginal cost.

³¹ Id. at 37. Footnote 31 explains that the three scarcity event hours from 2007 were excluded from the calculation of mark-up, and also explains that prices on high load days were included in the calculation. A high load event occurs when hourly demand plus operating reserve targets exceed 90 percent of the available capacity. A scarcity event occurs when hourly demand plus operating reserve targets are greater than or equal to the available capacity before administrative measures are taken into account. See Id. at 155, footnote 67.



The price realized in a market may differ from the marginal cost of delivering one more MW to the market during periods of scarcity. Scarcity conditions exist as the quantity demanded for power in the market approaches or exceeds the available supply in the market. The price in a market can rise above the marginal cost of the highest cost unit operating on the system until supply and demand are balanced, with the price reflecting the marginal value to the load of the last MW consumed. The MMU and PJM are in agreement on the role of scarcity pricing in competitive markets.³²

Marginal Costs Employed in Price-Cost Mark-Up Analysis of the PJM Energy Markets Omit Opportunity Costs

The PJM Market Design already explicitly accounts for opportunity costs of not running in the Energy Market for offers submitted into the Regulation and Synchronized Reserve Markets,³³ so it is reasonable to expect that generators will factor in other types of opportunity costs in their Energy Market offers. However, opportunity costs associated with shut-down and start-up decisions or run-time restrictions for operating over time in the PJM Energy Markets have not been defined in the PJM Operating Agreement as they have for opportunity costs associated with the Regulation and Synchronized Reserve Markets. Without business rules defined in the PJM Operating Agreement, suppliers are required to submit requests for recovery of such opportunity costs to the MMU on a case-by-case basis.³⁴ Few suppliers have chosen to go through the MMU to have these opportunity costs represented in cost-based bids submitted to PJM as there is no clearly defined rules for determining the level of these opportunity costs. Consequently, suppliers bidding into the PJM Energy Markets with offers that differ from their short-run marginal costs as submitted to PJM, and used by the MMU to determine price-cost mark-ups, may be reflecting these opportunity costs rather than attempting to exercise market power.³⁵

For example, generating units may offer bids *below* their short-run marginal cost submitted to PJM in an effort to continue running during off-peak hours so they do not need to shut down and then incur costs to start-up and risk being unable to run during profitable shoulder and peak hours. For these generating units, it is less costly to run at prices below their submitted marginal costs for a few hours rather than incur larger costs for shutting down and then starting up again a few hours later. Evidence of this type of bidding behavior exists when observing negative price-cost mark-ups during low-price, off-peak periods.³⁶ Generating units are accounting for their opportunity costs, including forgoing revenue when shut down and incurring shut-down and start-up costs, in their offers so they can remain running during off-peak hours.

³² Id. at 43-44.

³³ See PJM OATT, Attachment K-Appendix, Section 1.11.4 and Section 1.11.4A.

³⁴ See PJM Manual 15: Cost Development Guidelines, Revision 8, Effective Date 10/16/2007 at 38.

³⁵ See PJM Manual 15: Cost Development Guidelines, Revision 8, Effective Date 10/16/2007 at 38. "For example, if a unit is must run by PJM for a transmission constraint and if that unit has only a significantly limited number of available annual run hours, the opportunity cost associated with providing must run output is the value associated with the lost opportunity to produce energy during a higher valued period within the year."

³⁶ Id. at 39, Table 2-37 showing negative average price-cost mark-ups at LMPs below \$40 accounting for 38 percent of hours. Figure 2-5 at 44 show negative average mark-ups during between 2am and 6am.



Generating units may also be run-time restricted by their operating permits for environmental reasons or restricted to a maximum number of starts before being taken out of service for maintenance. Units with run-time or start restrictions may offer bids in excess of their marginal cost submitted to PJM to keep from being dispatched in the energy market. Rather than exercising market power, units bidding in this manner are attempting to save their limited hours or start-ups for high-demand days when the prices will be higher, and when generation will be more valuable and provide greater system reliability to serve load on those peak days.

This practice and its rationale are analogous to bidding below marginal cost to ensure a unit is not shut down. In this case, units with run-time or start restrictions that offer bids in excess of their marginal costs submitted to PJM are factoring in their opportunity costs of not running during higher price, higher load periods. Suppose a run-time or start restricted unit always offers bids at its short-run marginal cost submitted to PJM or is offer capped at its submitted short-run marginal cost. The unit may be called upon to operate in hours when its generation is not as valuable economically (as measured by the prevailing market price) or for reliability if demand is not approaching a peak. The unit may run out of hours or starts early in the year such that when its generation is most valuable for reliability to serve peak loads, it is unavailable. In this case, the act of offering bids above the marginal cost submitted to PJM in some periods is not an exercise of market power, but rather an inclusion of opportunity costs that result from run-time or start-up restrictions.

In summary, the use of bid offers or market price equal to short run marginal cost provides a general benchmark for competitive price levels. But the current practice for marginal costs submitted to PJM omits opportunity costs associated with the operational realities of some generating units that confront shut-down and start-up decisions and costs, run-time restrictions, or limited numbers of starts. PJM notes the conclusion reached by the MMU that the annual average price-cost mark-up of 0.09 is "strong evidence of competitive behavior" in spite of the price-cost mark-up being different from zero.³⁷ Consequently, PJM believes it is difficult, if not impossible, to draw the conclusion that market power has been exercised when there is any deviation of the market price or bid offers from the marginal costs submitted to PJM of delivering one more MW to the market.

PJM looks forward to working in consultation with the MMU in the stakeholder process to develop changes to the PJM Market Design that explicitly include these type of opportunity costs in cost-based bids with the benefit of attempting to discern the difference between the bidding of opportunity costs and the potential exercise of market power.

The Price-Cost Mark-up is Not an Accurate Measure of Impact on LMP

The MMU in its analysis of the PJM Energy Markets has provided explicit measures of the impact of marginal unit mark-ups on LMP values. The MMU has provided these measures on LMP by load zone during peak and off-peak hours, by month for peak and off-peak hours, by price category, and

³⁷ 2007 State of the Market Report, Volume 2: Detailed Analysis at 9.



by exempt and non-exempt units.³⁸ The MMU has provided this analysis despite its own statement with respect to the use of price-cost mark-ups:

"The price-cost markup index is a measure of conduct or behavior by the owners of generating units and not a measure of market impact."³⁹

PJM strongly agrees with the MMU's statement because PJM believes an accurate analysis of the impact of marginal unit mark-ups requires a full re-dispatch of the market and a recalculation of prices under the new dispatch. Re-dispatch is required as the marginal unit, once offered at its marginal cost, may no longer be marginal. Therefore, the MMU analysis of the mark-up impact on LMP can overstate the potential impact of mark-up on LMP. This has been acknowledged by the MMU as well.⁴⁰

The following example shows the problems with the mark-up analysis as cited by the MMU and why a full analysis requires a re-dispatch of the entire market to derive the market price. In the example below, none of the units is offer capped.

Example 1: Demand = 450 MW					
Supplier	Offer Capped	Offer Price (\$/MWh)	Marginal Cost (\$/MWh)	MWh Offer	MWh Dispatched
1	No	\$100	\$100	100	0
2	No	\$90	\$90	100	0
3	No	\$80	\$80	100	0
4	No	\$70	\$50	100	50
5	No	\$65	\$65	100	100
6	No	\$60	\$60	100	100
7	No	\$55	\$55	100	100
8	No	\$50	\$50	100	100

In Example 1, there is 450 MW of demand that can be met with 800 MW of available supply. All suppliers pass the TPST and all would be offer capped except that Supplier 1 is exempt from offer capping. The resulting price in the market is \$70/MWh with Supplier 4 as the marginal unit. Under the mark-up analysis done in the SOM Report, a mark-up component of \$20 (\$70 minus \$50) would be attributed to this marginal unit giving the erroneous impression of a large mark-up over marginal cost.

However, if the market were re-dispatched with Supplier 4 offered at its marginal cost of \$50/MWh, and with all other units bidding in at their cost, the new market price would be \$65/MWh with Supplier 5 as the marginal unit. In re-dispatching the market we observe the mark-up over cost is really only \$5 rather than the \$20 that would be reported in the MMU mark-up analysis.

Example 1: Demand = 450 MW, Supplier 4 offering at cost					
Supplier	Offer Capped	Offer Price	Marginal Cost	MWh Offer	MWh Dispatched

³⁸ Id. at 37-40, Tables 2-35, 2-36, 2-37, and 2-38.

³⁹ Id. at 33.

⁴⁰ Id. at 36.



		(\$/MWh)	(\$/MWh)		
1	No	\$100	\$100	100	0
2	No	\$90	\$90	100	0
3	No	\$80	\$80	100	0
5	No	\$65	\$65	100	50
6	No	\$60	\$60	100	100
7	No	\$55	\$55	100	100
8	No	\$50	\$50	100	100
4	No	\$50	\$50	100	100

The PJM Market Design only allows price-based offers to stand when there is a determination that the market is structurally competitive, as it was in the previous example. Hence, it is only possible for there to be a positive price-cost mark-up when the TPST determines suppliers do not have structural market power.⁴¹ In the SOM Report the MMU offered caveats regarding its analysis, including the need to re-dispatch the market, and the fact that the price-cost mark-up provides only a general, not a definitive, benchmark of competitiveness as discussed previously, and that positive mark-ups can only take place with a finding that suppliers do not have structural market power. The result is that the mark-up impact analyses cannot be taken as definitive evidence that market power has been exercised.⁴² The MMU acknowledged that there was a need to re-dispatch the market to obtain an accurate analysis.

Whether Exempt Units Have Exercised Local Market Power Cannot Be Definitively Determined Based on Exempt Units' Impact on LMP

The MMU as part of its mark-up analysis has examined the mark-up contribution of units exempt from market power mitigation measures on the overall mark-up of LMP.⁴³ In addition to the caveats expressed by the MMU with respect to using the price-cost mark-up and a measure of market impact, the MMU also states:

“This analysis does not address whether these units would have been offer capped had they not been exempt and therefore does not address how much the contribution to LMP would have changed if the exemption had been removed.”⁴⁴

PJM agrees with the MMU's caveat to its analysis. Even if exempt units had been subject to offer capping, it is not known whether they would have been offer capped. The analysis of price-cost mark-up for the exempt units relies on estimates of marginal costs rather than market participant submitted data to PJM on the marginal cost of operation, and does not include the type of opportunity costs discussed previously. Consequently, it is difficult to definitively whether the

⁴¹ The exception to this are the 56 units exempt from market power mitigation. See supra note 13.

⁴² The MMU states that “The markup analysis is a more general measure of the competitiveness of the Energy Market.” Id. at 36.

⁴³ Id. at 39-40.

⁴⁴ Id. at 39-40.



observed bidding behavior is reflective of the actual marginal costs or an exercise of market power in spite of the assertion by the MMU that exempt units exercised local market power.⁴⁵

As stated in the Appendix below, PJM is not opposed the lifting of the exemption from offer capping for the exempt units in question. Should FERC rule the exemption be lifted, currently exempt units would likely need to submit their marginal costs to PJM, and with refinements to include opportunity costs within the submitted marginal costs as previously discussed, it will be much clearer to determine whether market power has been exercised going forward.

But even assuming the marginal costs of exempt units were known, an analysis of the impact of mark-ups of exempt unit encounters the same problems in general for the mark-up analysis conducted by the MMU. A complete analysis would require a complete re-dispatch of the market to determine the new prices that would have prevailed had the exempt units been offer capped. A small example similar to Example 1 is presented below to illustrate the need to re-dispatch the market to determine the mark-up impact of an exempt unit.

Example 2: Demand = 450 MW, Exempt Unit Not Offer Capped					
Supplier	Offer Capped	Offer Price (\$/MWh)	Marginal Cost (\$/MWh)	MWh Offer	MWh Dispatched
1	Exempt	\$70	\$50	100	50
2	Yes	\$65	\$65	100	100
3	Yes	\$60	\$60	100	100
4	Yes	\$55	\$55	100	100
5	Yes	\$50	\$50	100	100

In Example 2, there is 450 MW of demand that must be met with only 500 MW of available supply. All suppliers would fail the TPST and all would be offer capped except that Supplier 1 is exempt from offer capping. The resulting price in the market is \$70/MWh. However, if the exempt unit were offer capped, its marginal cost is only \$50/MWh. Erroneously assuming the exempt unit would continue to be marginal if it were offer capped would lead to the conclusion that the price impact of not offer capping the exempt unit is \$20/MWh. This overstates the actual impact on price if the market were to be re-dispatched with the exempt unit offer capped at its marginal cost of \$50/MWh.

Example 2: Demand = 450 MW, Exempt Unit Offer Capped					
Supplier	Offer Capped	Offer Price (\$/MWh)	Marginal Cost (\$/MWh)	MWh Offer	MWh Dispatched
2	Yes	\$65	\$65	100	50
3	Yes	\$60	\$60	100	100
4	Yes	\$55	\$55	100	100
5	Yes	\$50	\$50	100	100
1	Exempt,Capped	\$50	\$50	100	100

⁴⁵ Id. at 16.



Re-dispatching the market for Example 2 with the exempt unit capped results in a price of \$65/MWh. The marginal unit is no longer Supplier 1, but it is Supplier 2 with a marginal cost of \$65/MWh. Consequently, the actual price impact of not having offer capped the exempt unit is really only \$5/MWh rather than \$20/MWh.

Cleared Offers in the Regulation Market Do Not Approach the \$100/MWh Offer Cap despite the Finding of Structural Market Power

The one market the MMU could not conclude had competitive results in 2007 was the PJM Regulation Market, but it is important to note the MMU *did not conclude* the Regulation Market was non-competitive.⁴⁶ The MMU has not reached a conclusion based on the absence of actual cost data submitted to PJM by market participants for the provision of regulation service.⁴⁷ While the MMU computed cost estimates for regulation, and based on those estimates has computed what appear to be large price mark-ups over cost, no definitive conclusion can be reached.

PJM understands the MMU's reluctance to draw any definitive conclusions in the case of the Regulation Market without actual cost data, and with the MMU's finding of persistent structural market power. However, it is important to note the following characteristics regarding the Regulation Market:

1. The offers of the two largest suppliers by ownership are capped at their submitted marginal costs plus \$7.50/MWh;⁴⁸
2. There is a \$100/MW offer cap, yet the cleared Regulation offer price (market clearing price less the lost opportunity costs) rarely exceeds \$20/MWh;⁴⁹
3. The number of eligible offers as defined by the MMU exceeded the demand by almost 2-to-1, and the total amount offered on average exceeded demand by almost 4-to-1 in 2007.⁵⁰

In spite of structural market power, an offer cap of \$100/MWh and no must-offer requirement, at no time has any supplier or group of suppliers been able to drive the cleared offer price close to the \$100/MWh offer cap. This seems to PJM to be an indication that the remaining non-dominant suppliers in the Regulation Market could be behaving competitively if the actual costs are in excess of those estimated by the MMU.

PJM is currently working with stakeholders through the Three Pivotal Supplier Task Force to examine potential changes to the market power mitigation mechanism in the Regulation Market, including the MMU's proposal to implement the TPST, so as to ensure competitive outcomes while allowing for appropriate compensation to suppliers of regulation.

Conclusions

⁴⁶ Id. at 1 and 279.

⁴⁷ Id. at 279.

⁴⁸ Id. at 285.

⁴⁹ Id. at 288. See Figure 6-2.

⁵⁰ Id. at 283, Table 6-1.



The SOM Report is by necessity a lengthy and data intensive document, and PJM applauds the work the MMU has put into its analysis of the PJM Markets. PJM's key points about the conclusions of the SOM Report can be summarized as follows:

1. The determination that a market is structurally non-competitive or that suppliers possess market power indicates there is a tight supply-demand balance and/or high ownership concentration.
2. Some of the drivers of supply-demand balance can be addressed by market design, but there are others that cannot be addressed by market design and are beyond PJM's control.
3. The existence of structural market power does not result in the exercise of market power as suppliers deemed to possess structural market power have their offers capped at marginal or incremental cost. Moreover, mitigation takes place regardless of whether a supplier has an incentive to raise prices above competitive levels. In particular if a generator owner is also an LSE, and the generator/LSE has a net load obligation to serve, even if it possesses structural market power as determined by the TPST, it has no incentive to raise prices above competitive levels, yet it would still be mitigated.
4. The PJM Market Design ensures that the results of the RPM Capacity Market remain competitive through the offer capping of generators deemed to have structural market power, which is endemic to capacity markets in general and not just to PJM.
5. The increase in fuel-cost-adjusted LMP from 2006 to 2007 is due to the tightening of the supply-demand balance from 2006 to 2007 which dominated the slight decrease in fuel cost. Fuel-cost-adjusted LMP using a common base year for fuel costs would facilitate a comparative analysis of market performance over the life of PJM's Energy Market and separate out price changes due to fuel cost from other aspects of market performance.
6. Price offers equal to marginal cost has been employed by the MMU as the benchmark for competitive prices and evidence of market power. However during periods of scarcity the price can exceed marginal costs without the exercise of market power, and opportunity costs related to the existence shut-down or start-up decisions/costs, and the existence of run-time or number of start restrictions should be included in marginal costs submitted to PJM and used by the MMU as part of the price-cost mark-up analysis.
7. Analyzing the LMP impacts of price-cost mark-ups of marginal generating units for non-exempt or exempt units can overstate the effect of mark-ups on LMP. The only way to get a true impact of mark-up on LMP is to re-dispatch the market under the presumption all units offer their marginal cost to derive the new LMP value.
8. In spite of the MMU's finding of structural market power in the Regulation Market, and lack of actual unit cost by which to evaluate the competitiveness of the Regulation Market, the cleared offer prices rarely exceed \$20/MWh even when suppliers could push prices to \$100/MWh offer cap and there is no must offer requirement.

PJM's Market Design incorporating market power mitigation when there is a determination of structural market power has helped ensure competitive results. PJM stands ready to work with the MMU and market participants in coming to a consensus understanding of the analysis performed and conclusions reached by the MMU in the 2007 SOM Report. PJM is committed to working with the MMU and stakeholders to develop additional analytical tools to enhance the evaluation of market performance, and to refining the market design and market mitigation procedures through the stakeholder process to improve market performance going forward.



Appendix



PJM Response to the 2007 State of the Market Report Recommendations

The 2007 State of the Market Report issued by the PJM Market Monitoring Unit contained nine recommendations that were categorized as continued actions and four recommendations that were categorized as new actions. PJM has reviewed the recommendations and provides the following response to the recommendations.

Continued Action Recommendations

1. **MMU Recommendation** - Retention and application of the improved local market power mitigation rules to prevent the exercise of local market power in the Energy Market while ensuring appropriate economic signals when investment is required.

PJM Response – PJM remains committed to retaining robust local market power mitigation rules and procedures. PJM stakeholders are currently considering improvements to local market power mitigation rules through the three pivotal supplier task force which reports to the Market Implementation Committee. PJM supports this effort.

2. **MMU Recommendation** - Retention of the \$1,000 per MWh offer cap in the PJM Energy Market and other rules that limit incentives to exercise market power.

PJM Response – PJM is committed to retaining rules that limit incentives to exercise market power including the overall existing energy market offer cap.

3. **MMU Recommendation** - Retention and application of the rules included in PJM's RPM Tariff to stimulate competition, to provide direct incentives for performance, to provide locational price signals, to provide forward auctions to permit competition from new entrants and to limit market power by the application of clear and explicit market power mitigation rules. Implementation of enhancements to incentives for capacity resource performance to ensure stronger, market-based incentives for actual performance when needed.

PJM Response – PJM remains committed to retaining robust market power mitigation procedures in the capacity market. PJM agrees with the market monitor that the RPM design includes robust market power mitigation procedures and they should be retained. The RPM Capacity Market design explicitly allows competitive prices to reflect local scarcity without relying on the exercise of market power to achieve the objectives of the Capacity Market design and explicitly limits the exercise of market power.

4. **MMU Recommendation** - Implementation of enhancements to PJM's rules governing operating reserve credits to generators.

PJM Response – PJM has worked with stakeholders to develop enhancements to balancing operating reserve rules, which are expected to be implemented in the fall of 2008. PJM also plans to implement a Day-ahead scheduling reserve market in June 2008.



5. **MMU Recommendation** - Continued enhancements to the cost-benefit analysis of congestion and transmission investments to relieve congestion, especially where that congestion may enhance generator market power and where such investments support competition.

PJM Response – PJM agrees that we have significantly improved the approach to the cost-benefit analysis of transmission investments. PJM expects to continue to work through the stakeholder process to enhance the economic planning rules and procedures.

6. **MMU Recommendation** - Modification of rules governing demand-side programs to ensure appropriate levels of payment and to ensure appropriate measurement and verification of demand-side response. Evaluation of additional actions to address institutional issues that may inhibit the evolution of demand-side price response.

PJM Response – PJM has developed improved measurement and verification rules through the stakeholder process that are expected to be filed with FERC prior to the summer. PJM has also initiated a Demand Response Steering Committee that will address market design and policy issues related to addressing barriers to the further development of demand-side response. PJM does not believe that the problems with demand side bidding are widespread but has developed improved measurement and verification rules to address this issue.

7. **MMU Recommendation** - Provision of data to PJM from external control areas to enable improved analysis of loop flows in order to enhance the efficiency of PJM markets.

PJM Response – PJM has worked with MISO and other control area operators to attempt to address the lack of data transparency and loop flow issues. PJM Staff has met with FERC Staff on this matter and raised this issue explicitly with FERC in comments provided by PJM and participated in the “Transparent Dispatch Advocates” coalition’s comments to FERC in the rulemaking which led to Order 890. PJM has also raised this issue with NERC, which has been reluctant to act. PJM expects to continue to give high priority to addressing loop flow and interregional congestion management issues through a variety of forums.

8. **MMU Recommendation** - Continued enhancement of mechanisms used to manage flows at the interfaces between PJM and surrounding areas.

PJM Response – PJM is in the process of developing improvements to rules related to management of ramp limitations to address hoarding and gaming concerns.

9. **MMU Recommendation** - Continued enhancement of PJM’s posting of market data to promote market efficiency.

PJM Response – PJM remains committed to providing transparent data and information for all market participants. PJM expects to continue to work on this issue through the stakeholder process.



New Action Recommendations

1. **MMU Recommendation** - Enhancements to PJM's scarcity pricing rules to create locational scarcity pricing signals in place of regional ones and to create pricing stages with corresponding stages of scarcity pricing to ensure competitive prices.

PJM Response – PJM agrees with the Market Monitor that a review of scarcity pricing rules should be undertaken. The PJM stakeholders will consider enhancements to scarcity pricing rules in the three pivotal supplier task force which reports to the Market Implementation Committee. PJM believes that any changes to scarcity pricing rules must also consider impacts on capacity market design and capacity market prices.

2. **MMU Recommendation** - Implementation of targeted, flexible real-time, market power mitigation in the Regulation Market.

PJM Response – PJM has concerns with the analytical methods that are utilized by the Market Monitor in the State of the Market Report to evaluate eligible supply in the Regulation market. In PJM's opinion, the Market Monitor's approach significantly and incorrectly reduces the regulation supply that is available when it performs its market structure analysis. PJM has discussed this difference in analysis with the MMU. PJM stakeholders are considering alternatives to enhance market power mitigation approach in the Regulation market. This evaluation is being considered by stakeholders in the three pivotal supplier task force which reports to the Market Implementation Committee. Since regulation costs are difficult to estimate, it may be appropriate for stakeholders to consider mitigation approaches that are not based on cost estimates. PJM believes it is premature to consider the additional MMU recommendation that all suppliers be required to provide cost-based regulation offers, until the current mitigation approach in the regulation market is enhanced.

3. **MMU Recommendation** - Consistent application of local market power rules to all constraints.

PJM Response – As detailed in previous documents, PJM is concerned about the performance of the three pivotal supplier test when it is applied to large-scale transmission limits, such as the exempt interfaces that have a diversity of eligible generation available to control transmission congestion. PJM has observed oscillatory results in the three pivotal supplier test when it is applied to such interfaces. In light of these performance problems, PJM is developing software enhancements to improve the performance of the three pivotal supplier analysis and is working with stakeholders through the three pivotal supplier task force, which reports to the Market Implementation Committee, to perform evaluations of alternative approaches to mitigation in these cases. Additionally, this issue may be considered by the FERC in the near future since it was identified in a complaint filed by the Maryland PSC in docket number EL08-34-000.



4. **MMU Recommendation** - Consistent application of local market power rules to all units, including those currently exempt from offer capping

PJM Response – As stated by the Market Monitor in the 2007 State of the Market Report, FERC’s January 25, 2005 order maintained the offer capping exemption for 56 generating units for which construction commenced in reliance on the exemption. The FERC noted, however, that grandfathered units would “still be subject to mitigation in the event that PJM or its market monitor concludes that these units exercise significant market power.” In this order, the Commission did not define what would constitute “significant market power” warranting the lifting of an exemption.

Implementing these orders, section 6.5 of Schedule 1 of the Operating Agreement⁵¹ exempts the grandfathered units specified by the Commission, but provides that “[i]n the event that [PJM] or the PJM Market Monitor concludes that a generation resource exempted by this section 6.5 exercises significant market power, then [PJM] may impose mitigation on such generation resource, provided that, prior to imposing mitigation, [PJM] or the PJM Market Monitor makes a filing under section 205 or 206 of the Federal Power Act documenting the exercise of market power by the generating resource and the Commission has accepted such filing.”⁵² Since these rules have been effect, there has been only one case in which the PJM Market Monitor has provided an opinion to PJM that a particular construction-exempt generator allegedly exercised market power. In this case, the matter was properly referred to the Commission, which evidently determined that there was insufficient basis for formal action in the matter.

Additionally, this issue may be considered by the FERC in the near future since it was identified in a complaint filed by the Maryland PSC in docket number EL08-34-000. As indicated in its response to this complaint, PJM is not opposed to the Commission’s consideration of the removal of the exemption should it determine market conditions have changed rendering the exemption no longer just and reasonable. The issue has squarely been presented to FERC through the Maryland PSC Complaint and PJM’s response to that Complaint.

⁵¹ The rules are contained in both Schedule 1 of the Operating Agreement and the Appendix to Attachment K of the PJM Open Access Transmission Tariff (“PJM Tariff”), which are identical.

⁵² Operating Agreement, Sch 1 § 6.5.