PJM's Response to the 2015 State of the Market Report

May 13, 2016

PJM Interconnection

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Contents

Introduction

The *2015 State of the Market Report* issued by PJM's Independent Market Monitor (IMM) provides an assessment of market performance and recommendations aimed at enhancing PJM's market design or market performance.[1] The Market Monitor performs an important role in providing an independent assessment of market performance and provides valuable insights in its conclusions and recommendations. This report will provide to stakeholders PJM's observations on the market and evaluations of each substantive recommendation offered by the IMM.

In the *2015 State of the Market Report*, the IMM concludes that the PJM markets work.[2] The IMM concludes that the results of the PJM Energy, Capacity, Regulation, Synchronized Reserve, Day-Ahead Scheduling Reserve and Financial Transmission Right (FTR) markets were competitive. PJM agrees with the IMM and believes the observed market results support these conclusions.

In the *2015 State of the Market Report*, the data, information, analysis, and recommendations are organized by market type (energy, capacity, ancillary services and FTRs) and by specific topic areas that touch on PJM markets (operating reserves, demand response, generator net revenue, environmental and renewable energy regulation, interchange transactions, congestion and marginal losses, and generation and transmission planning). This paper follows a similar structure to provide easy reference to PJM's responses to the *2015 State of the Market Report* conclusions and recommendations.

PJM's Markets Produce Competitive Results to Ensure Reliability at Least-cost

In 2015, the results of PJM's markets were competitive with offer behavior consistent with marginal costs, and market prices consistent with the marginal cost of delivering one more megawatt (MW) or megawatt-hour (MWh) to the market at a specific location.

PJM maintains reliability through its markets. Reliability in real-time operations is maintained through security constrained unit commitment in the Day-Ahead and Real-Time Energy Markets by the use of locational marginal prices (LMP) and market-based provision of ancillary services. Resource adequacy is maintained through the Reliability Pricing Model (RPM) capacity market to ensure sufficient resources are both system-wide and in the right locations to serve peak load. All of these market mechanisms interact to produce competitive outcomes where reliability is achieved in the most efficient, cost-effective manner possible.

Given that power markets do not always mirror the characteristics of textbook competitive markets, the fact that wholesale power markets in PJM have achieved competitive results consistently is a good indication that the fundamental design of the energy, ancillary services, and capacity market mechanisms are sound. Together with appropriate market power mitigation in place, the market design incents resources to offer at, or close to, marginal or incremental costs.

[1] *2015 State of the Market Report for PJM: Volume 2: Detailed Analysis,* March 10, 2016 ("*2015 SoM Report*") at http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2015.shtml

[2] *2015 SoM Report* at 1.

Setting the Stage: Another Mild Year

PJM experienced historically low energy prices in 2015 with a load-weighted average LMP of $36.16. The lower-than-average wholesale energy prices are a result of both low natural gas prices, especially in the eastern portion of PJM, as well as flat total energy demand. The winter of 2015, (January through March) witnessed higher-than-average energy demand, primarily weather driven[3] as shown in Figure 2 below. This was largely offset by a warmer-than-normal autumn and early winter (October to December) at the end of 2015. Summer of 2015 was normal, but with a slightly warmer September. The lower demand in winter and relatively average summer and warm fall have set up natural gas prices to remain low in the near term due to the increased storage levels, keeping prices low overall.

Figure 1. Annual Fuel Cost Adjusted and Load Weighted LMP

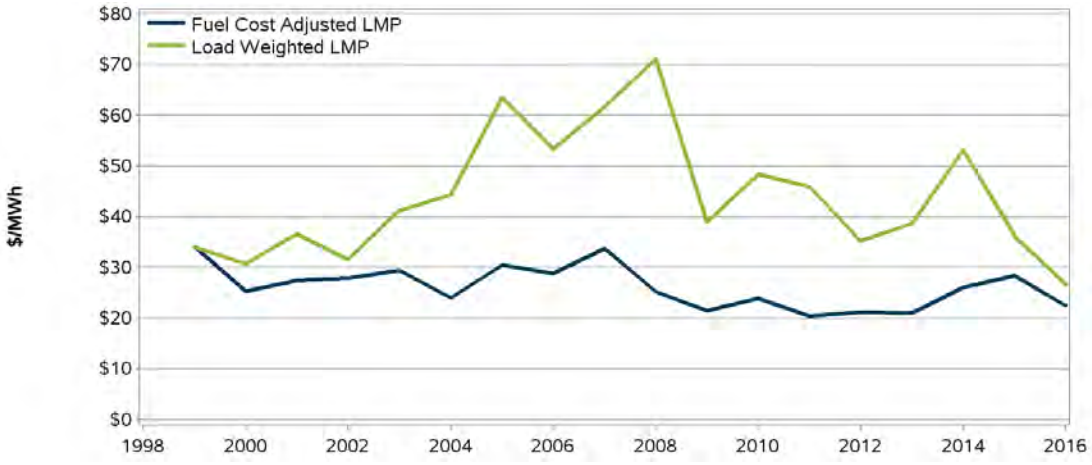
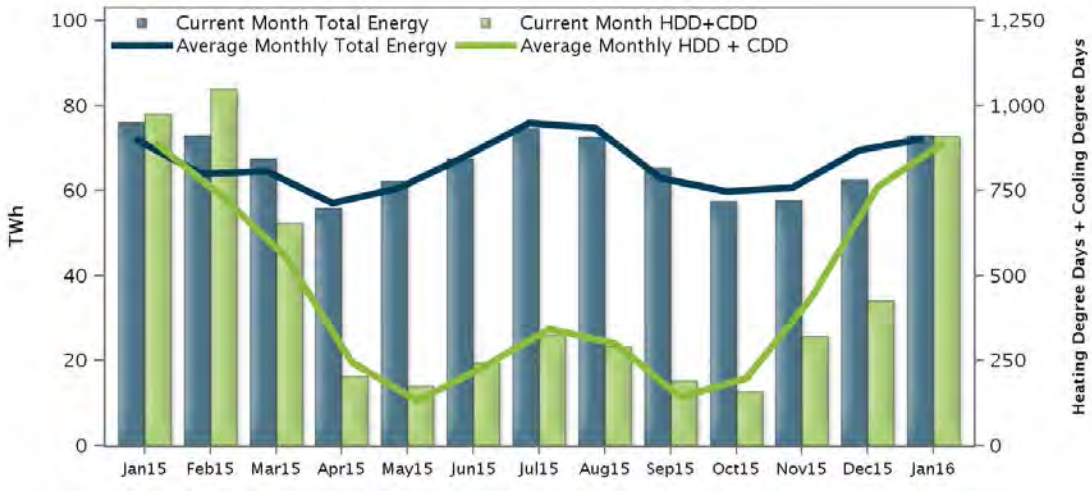


Figure 2. Average Monthly Heating and Cooling Degree Days and Monthly Energy



[3] The weather parameter shown in Figure 2 is a monthly sum of daily Heating Degree Days (HDD) and Cooling Degree Days (CDD). Degree days represent a deviation from a baseline temperature, in this case 60 degrees for HDD and 65 degrees for CDD. As temperatures get more extreme, colder or hotter, either HDDs or CDDs, respectively, will increase.

Ever-Evolving Markets

PJM has experienced great change over the past year. With the implementation of a new Capacity Performance market product, as well has a shortened day-ahead market clearing time and posting deadline, PJM has recently undertaken many system changes and upgrades to comply with requests on behalf of the Federal Energy Regulatory Commission (FERC), PJM stakeholders, and to incorporate the IMM recommendations. PJM's ability to adjust and transform given the evolution of wholesale and retail electric markets demonstrates the robust nature of the PJM market design.

Capacity Performance

PJM held the first Base Residual Auction under the new Capacity Performance rules, as well as two transitional auctions. Together, these auctions set the stage for June 2016 as the start of new requirements and compensation for reliability for PJM. The State of the Market Report primarily focuses on 2015 and the rules in place for that year. As such, the report acknowledges that many of the recommendations are no longer applicable under Capacity Performance.

PJM believes that the auctions conducted in 2015 yielded competitive and encouraging results and positioned PJM well for the coming delivery year. There are two noteworthy observations. First, PJM observed few offers up to the applicable offer caps and market clearing prices were below those caps. This occurred in spite of the changed market power mitigation to allow resources to offer at "New CONE x B" (or in the transition auctions a percentage of that value). CONE stands for Cost of New Entry. This is a strong indication of competitive behavior and competitive pressures capacity market sellers are facing in the capacity market.

Secondly, there is a narrow pricing gap between base capacity and Capacity Performance. There were fewer resources than initially expected to offer in as base capacity and more offering in as Capacity Performance. Furthermore, the "premium" for being Capacity Performance at the margin is less than many analysts had anticipated. The overall implication is that while the premium for Capacity Performance is real, the impact of the ability to factor in costs and risks associated with taking on the obligation was less than expected and subject to competitive pressures. Once Capacity Performance is in full effect, actual experience will guide future changes and recommendations.

Figure 3. Capacity Performance Clearing Prices

2018-19 Base Auction

Obtained more than the targeted 80% of CP (~140,600 MW)

Clearing prices rose as expected (Competitive result)

	CP	Base
RTO	$164.77	$149.98
COMED	$215.00	$200.21
EMAAC	$225.42	$210.63

2016-17 Transition Auction

Obtained the targeted amount of CP (~95,000 MW, 60%)

Competitive Clearing price (below the established cap of $165.27)

	CP	Base
RTO	$134.00	NA

2017-18 Transition Auction

Obtained the targeted amount of CP (~112,000 MW, 70%)

Competitive Clearing price (below the established cap of $210.83)

	CP	Base
RTO	$151.50	NA

Energy Market Uplift Payments Are Declining

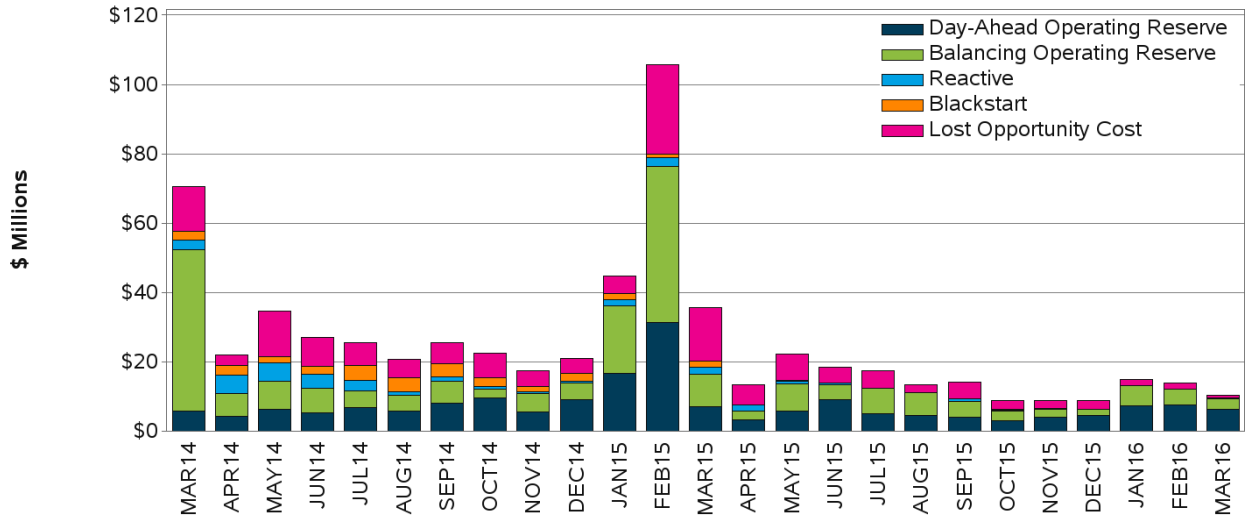
Power system operation and wholesale power markets do not always lend themselves to simple expression of prices, and one example is energy prices that can be expressed in $/MWh that cover all costs of all units. This is because generator operation must consider factors such as start-up and shutdown costs, minimum run times, minimum down times, start times and minimum dispatch levels. Respecting these physical unit characteristics can result in the need for uplift payments, meaning that all the costs for which a given unit must be compensated are not reflected in the transparent $/MWh LMP.

Uplift payments to generators, along with energy payments in $/MWh, form a set of prices that match dispatch instructions and ensure reliability in operations. These uplift payments, which could be thought of as unit-specific prices needed to ensure reliability, are what economists would call "individually rational". In other words, if these prices were sent to generators along with dispatch quantities, the prices alone would give the generators the incentive to match those dispatch quantities exactly. Without such prices, generators would have no incentive to follow dispatch instructions and would jeopardize reliable operations.

Uplift may also come from conservative practices in dispatch operations and a need to commit resources outside of the market to ensure certain reliability services (such as black start and reactive power) are provided. Alternatively, uplift may arise from the need to ensure sufficient resources, especially gas-fired resources, are available to meet winter peak loads when generation is competing with heating load for commodity gas and pipeline transportation. To the extent that such commitments can be done within the market itself, it is possible to minimize this uplift and the resulting inability-to-hedge costs as discussed below.

Figure 4 below shows improvements in uplift, broken down by category. Uplift levels were well-managed in 2015. Overall levels of uplift continue to trend downward with only the winter months showing higher levels. This increase in the winter is due to higher fuel prices and the ongoing tension between the gas needs of residential heating and electric generation. The competing demands lead some gas-fired resources to be run longer due to inflexibility in ratable takes from gas pipelines, as well as the inability to get more flexible gas deals from third-party marketers. The continuing improvement in levels of uplift is due in part to rule improvements, and in part to continuing efforts throughout Markets, Operations, and Dispatch to improve decision making and emphasize cost-efficiency when making reliability decisions.

Figure 4. Uplift Payments over the Past Two Years



Specific Initiatives in 2015 Helped Manage Levels of Uplift

Initiative	Estimated Savings
Improved scheduling and dispatch efficiency combined with lower natural gas prices	$25 million
More systematically committed long-lead time combustion turbines in real time	$24 million
Implemented changes to market rules to improve energy and reserve pricing	$12 million
Total	$61 million

Resource Investment

The PJM markets continue to signal appropriate levels of entry and exit. In 2015, 9,860 MW of generation retired. The bulk of retirements were coal units facing competition driven by inexpensive natural gas combined with the prospect of costly environmental upgrades. Another 3,900 MW of generation has announced retirement for 2016. Over 3,800 MW of new generation came on line in 2015, and more than 15,000 MW of generation is expected to come on line in 2016.

As described in the *2015 State of the Market Report*, net revenues covered avoidable costs for almost all generators in 2015, with the exception of super- and sub-critical coal plants. Only 50 percent of super-critical coal plants and 62 percent of sub-critical coal plants recovered their going forward costs.

Collectively, these figures indicate that the PJM markets are working to signal when inefficient resources should exit, and when (and where) new resources should enter the market. Rather than signaling an issue, these levels of entry and exit show a healthy market where rational participants react to price signals, and those price signals are reflecting the underlying needs of the system.

Table 1 shows the amount of new generation resources clearing for the last five Base Residual Auctions. Almost all of the new generation resources are combined-cycle natural gas facilities that benefit from technology and efficiency improvements along with low-cost fuel and environmental regulations.

Table 1. New Generation in the Last Five Base Residual Auctions

BRA Year	BRA Delivery Year	New Generation	Generation Uprates
2015	2018/2019	2,919.3	587.8
2014	2017/2018	5,927.4	339.9
2013	2016/2017	4,281.6	1,181.3
2012	2015/2016	4,898.9	447.4
2011	2014/2015	415.5	341.1

Events in 2015 and Proposed Changes

Financial Transmission Rights (FTRs)

Financial transmission rights were introduced as the market equivalent of physical (or firm) transmission rights to facilitate competitive trading within the open access system of a bulk transmission network. Each FTR awards its holders the difference in the congestion LMPs between two nodes, working as a hedge against transmission congestion. Since most of the market transactions that promote economic efficiency occur in the Day-Ahead Energy Market (whereas the Real-Time Energy Market focuses on energy and reserve balancing to maintain reliability), FTRs are, in principle, designed to hedge against the day-ahead congestion.

Before the LMP markets were introduced, load-serving entities and firm point-to-point customers, or collectively the load, relied upon physical transmission-contract-paths for delivery of electricity from low-cost generation sources to end-use customers. After the introduction of LMP markets, load was entitled to the allocation of financial transmission rights so that it could continue to receive the benefits of firm transmission access considering the load had paid for the transmission investments. Since load customers are paying demand charges that compensate for transmission costs, the FTR credits are refunded to customers to offset their congestion costs and avoid double payments.

Auction Revenue Rights (ARRs) were introduced in 2003 to provide load an alternative method to receive the benefits of the prior transmission investments, while allowing flexibility and incentives for FTRs to be deployed in a more efficient manner. The FTRs/ARRs were originally allocated according to the physical transmission contract paths which, given recent generation retirements and additions, are generally poorly aligned with the network contract paths associated with financial transmission rights. This potentially compromises customer benefits.

The ARR/FTR Construct

The ARR/FTR construct is a critical component of the LMP market design to support forward contracting as a critical element in the market architecture. One of the fundamental market design principles is that an efficient LMP spot market is necessary to provide a locational price reference to support forward contracting (including self-supply and bilateral transactions). Conversely, forward contracting fosters competition in spot trading (including the Day-Ahead and Real-Time Energy Markets) and should form the bulk of trades settled in the LMP market. In PJM on average, 78 percent of the day-ahead load obligation is met through self-supply and bilateral contracts and 22 percent is traded in the spot market. The ARR/FTR construct allows market participants to hedge their exposure to the short-term, hourly locational price differences by forming bilateral contracts. The point-to-point definition that incorporates the network transmission impact of congestion rights is a critical component to facilitating these mechanisms. Moreover, the PJM ARR/FTR construct meets FERC's guidelines for long-term firm transmission rights in organized electricity markets, which stemmed directly from Congress' Energy Policy Act of 2005. It preserves first priority to load, provides a long-term hedging mechanism, and promotes a robust, competitive market.

In summary, PJM believes that it would be inappropriate to discontinue the current ARR/FTR design. Nevertheless, there is potential to improve the design. PJM agrees with the IMM, for example, that the ARR allocation process can be enhanced by eliminating the sole reliance on historic generation source points. This entails removing historic source points associated with generation resources that have retired, and updating associating source points with active supply resources so that the ARR allocation can be better aligned with actual congestion patterns on the transmission system. Market design analysis would be needed to account for interactions with virtual trading and other activities in energy and reserve markets.

Allocation of Balancing Congestion

"Negative balancing congestion" refers to the settlement imbalance in real time that arises from the differences between the real-time and day-ahead market balancing positions when less transmission capability exists in the Real-Time Energy Market than was anticipated to be available in the Day-Ahead Energy Market. As it is calculated today, "balancing congestion" which cannot be reliably predicted by the market operator (either positive or negative), contains the balancing settlement for all market transactions. This includes physical transactions such as generation and load as well as virtual transactions such as increment offers, decrement bids and up-to-congestion transactions. As shown in Table 2 below, total congestion assigned to load in the Day-Ahead and Real-Time Energy Markets combined was $1.57 billion, and $616 million, respectively, in the 2014/2015 and 2015/2016 planning years. Total congestion assigned to financial entities, including increments offers, decrement bids and up-to-congestion transactions was approximately -$179 million and -$42 million respectively in this period.

Under the current PJM market design, those payments are coming from FTR holders. This adversely impacts LSEs' ability to hedge congestion. As a result, congestion funds may become insufficient to cover the actual congestion exposure and thus degrade the value of all FTRs. There is no rational basis for using FTR funds to make up for this real-time revenue imbalance that has no relevance to the day-ahead congestion charges the FTR funds are intended to cover. PJM staff believes that a rational mechanism for allocating this real-time imbalance should be developed from basic principles, taking into account the interactions with virtual trading in practice.

Table 2. Congestion Assignment in Day Ahead and Real Time

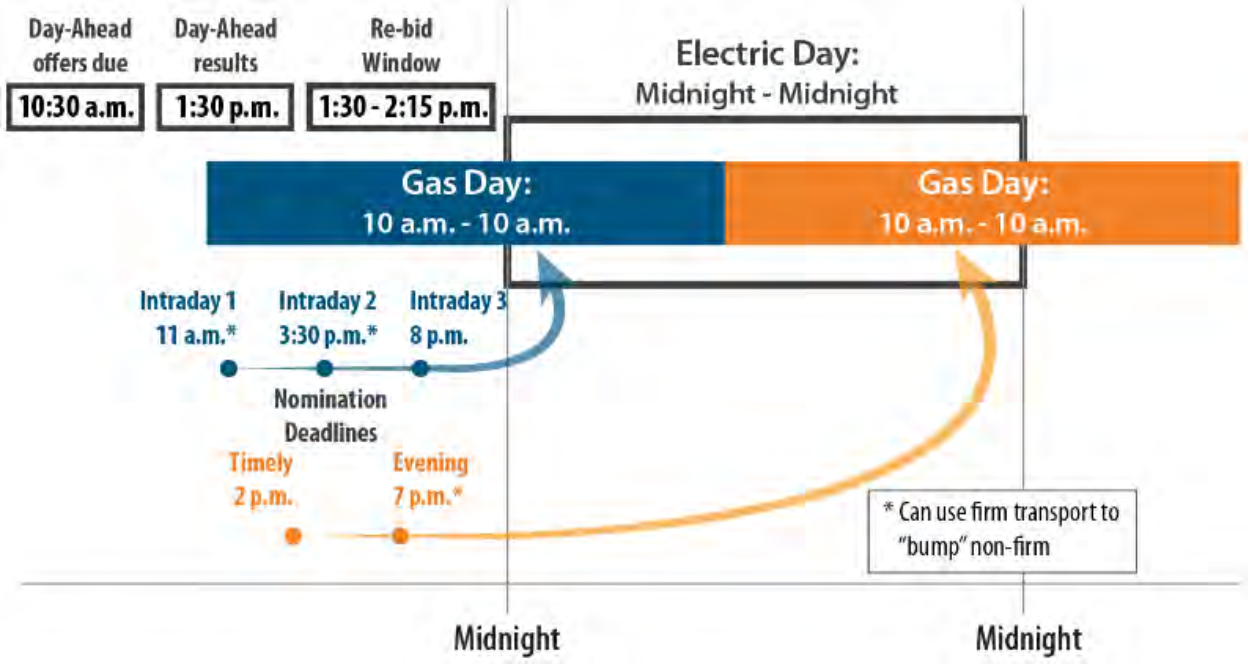
	Congestion Charges to Load ($millions)			Congestion Charges to Financial ($millions)[4]		
	Day Ahead	Real-Time Imbalance	Total	Day Ahead	Real-Time Imbalance	Total
2014/2015	$1,585	-$14	$1,570	$41	-$221	-$179
2015/2016*	$582	$34	$616	$71	-$114	-$42
*Thru December 2015; Positive value represents a charge, negative value represents a credit						

[4] 2015 SoM Report

Gas-Electric Coordination

The Polar Vortex demonstrated how significantly the conditions of the natural gas industry could influence PJM's ability to maintain reliability. Since that time, natural gas has continued to gain and will soon become the dominant fuel source in the footprint. PJM has implemented a number of rules to reflect these evolving conditions, including higher price caps for generation offers, and shifting and shortening the Day-Ahead Energy Market timeline.

Figure 5. Gas/Electric New Market Timing



PJM also took a number of steps to increase its awareness of gas pipeline conditions and improve coordination with the pipelines. The Operations division has a dedicated expert and consolidated the gas-electric coordination functions. PJM held weekly coordination calls and exchanged data with the pipelines to improve reliability on both systems. PJM continued its efforts to improve visibility for generators behind local distribution companies. Lastly, several significant improvements were made to automate tools and data so that analysts could easily access information.

PJM believes these improvements will aid reliability as natural gas becomes a more critical fuel. The 2015/2016 winter was not as challenging as prior winters and PJM took advantage of the opportunity to prepare for the future.

Interregional Coordination Continues

In order to support reliability across the Eastern Interconnection and promote effective market interactions, grid operators have developed joint operating agreements that establish frameworks for coordination and cooperation.

In 2015, PJM held market-to-market discussions with neighboring system operators NYISO and MISO to tackle issues related to data exchange, day-ahead market coordination, coordinated transaction scheduling, interchange optimization, pseudo ties, capacity deliverability, generation interconnection queues, and cross-border planning projects. Many of these initiatives are aimed to address some of the IMM recommendations regarding interchange transactions found in the 2015 State of the Market Report.

PJM and NYISO have successfully implemented a coordinated transaction scheduling system that streamlines electricity movement across their borders, reduces production costs, and partly addresses the IMM recommendation regarding collaboration with neighboring balancing authorities to better optimize interchange. The scheduling system enables market participants in PJM and NYISO to gain access to the least-expensive power sources in the two regions while helping grid operators utilize connecting transmission lines effectively. The system also factors projected price differences into scheduling decisions.

PJM and MISO continue to host joint stakeholder meetings to address critical seams issues and the framework for resolution. Recent stakeholder discussion topics included cross-border transmission planning, the interconnection queue process, capacity deliverability, firm flowgate rights, phase angle regulators and interface pricing. PJM and MISO have agreed on a method to model the Michigan-Ontario phase angle regulators in the market-to-market process with a tentative implementation of summer 2016. Updates to the joint market flow, firm flow entitlement, and data exchange requirements documents have been completed, and PJM and MISO are in the process of finalizing data exchange for phase angle regulators.

Supreme Court Ruling on EPSA

The FERC issued Order 745 on March 15, 2011, and allowed for demand response to be compensated at full LMP for load reductions in the energy market. Order 745 has been highly controversial and the Electric Power Supply Association (EPSA) filed legal challenges in federal court.

The case eventually advanced to the United States Supreme Court. On October 14, 2015, the Supreme Court heard the case and on January 25, 2016, in a 6-2 decision, ruled to reverse the lower court's ruling. The court stated that the FERC has authority over demand response, and while demand response could influence retail markets, the FERC is not regulating retail rates. Additionally, while the court did not rule whether LMP payments for demand response were correct, it did state that the FERC used "reasoned judgement" when determining the compensation for demand response.

The Supreme Court ruling supports the continued participation of demand response in wholesale markets. Demand response is valuable to markets and reliability. The decision has provided certainty and continuity with respect to demand response participation in PJM operations and markets.

Going Forward

The PJM market results were competitive in 2015 and prices reflected marginal costs and supply-demand fundamentals, but there will always be issues to address. Several issues are being debated in open dockets at the FERC such as uplift, virtual transactions, and offer caps. Other issues have emerged more recently either from the Market Monitor or as a result of changing conditions in the market. PJM is confident that the market results of 2015 reflect solid economic principles and disciplined behavior from market participants. PJM looks forward to working with the Independent Market Monitor to address the issues and recommendations contained in the *2015 State of the Market Report*.

PJM Response to IMM Recommendations from the 2015 State of the Market Report

Some recommendations made by the IMM have been repeated in past *State of the Market Reports*. Some of these recommendations have already been addressed or are being actively discussed within the stakeholder process. Several of the recommendations have been discussed by stakeholders in the past and have not been adopted or have been decided in a different direction by the FERC. A more detailed PJM response to the conclusions and recommendations from *2015 State of the Market Report* is provided below. PJM has either implemented or is in the process of addressing more than half of the recommendations.

Status	Description	Number of Recommendations	Percent
Implemented	These recommendations have been implemented.	49	35%
Stakeholder Process	These recommendations are under active discussion in the PJM stakeholder process or other stakeholder forum.	17	12%
Pending before the FERC	These recommendations are being considered by the FERC.	13	9%
Action Planned	PJM expects to take action or initiate a stakeholder discussion on this recommendation in 2015.	11	8%
No further action planned	PJM has reviewed this recommendation but does not plan to act on this issue in the near future due to No Stakeholder consensus (35%), Rejected by the FERC (13%), PJM Concerns (41%), or this recommendation is outside of PJM control (11%).	37	27%
Low Priority	These issues have low impact to the markets and PJM stakeholders. No action is planned in the near future.	12	9%

Energy Market Recommendations

The IMM has offered recommendations regarding the Energy Market.

IMM Recommendation: The MMU recommends that PJM retain the $1,000 per MWh offer cap in the PJM Energy Market except for when cost-based offers exceed $1,000 per MWh, and other existing rules that limit incentives to exercise market power.

Status – Pending before the FERC

PJM Response: The FERC has issued a Notice of Proposed Rulemaking (NOPR) regarding energy market offer caps. PJM currently has rules in place to allow cost-based offers to rise above $1,000 per MWh when needed.

IMM Recommendation: The MMU recommends that the rules governing the application of TPS test be clarified and documented.

Status – Pending before the FERC

PJM Response: The level of documentation on how PJM implements the Three Pivotal Supplier (TPS) test was raised as a concern by the IMM in the hourly offers proceeding at FERC. PJM intends to further clarify the final rules on how it implements market power mitigation following the resolution of that proceeding at FERC.

IMM Recommendation: The MMU recommends, in order to ensure effective market power mitigation where the TPS failed, that markup be constant across price and cost offers, that there be at least one cost-based offer using the same fuel as the available price-based offer.

Status – Pending before the FERC

PJM Response: This recommendation is being considered by the FERC in the hourly offers proceeding.

IMM Recommendation: The MMU recommends that in order to ensure effective market power mitigation when the TPS test is failed, the operating parameters in the cost-based offer and the price-based parameter limited schedule (PLS) offer be at least as flexible as the operating parameters in the available non-PLS price-based offer, and that the price-MW pairs in the price-based PLS offer be exactly equal to the price-based non PLS offer.

Status – Pending before the FERC

PJM Response: This recommendation is being considered by the FERC in the hourly offers proceeding.

IMM Recommendation: The MMU recommends that PJM require all generating units to identify the fuel type associated with each of their offered schedules.

Status – Implemented

PJM Response: PJM implemented this recommendation in 2014.

IMM Recommendation: The MMU recommends that under the Capacity Performance construct, PJM recognize the difference between operational parameters that indicate to PJM dispatchers what a unit is capable of during the operational day and the parameters that are used for capacity performance assessment as well as uplift payments. The parameters which determine non-performance charges and the amount of uplift payments to those generators should reflect the flexibility goals of the capacity performance construct.

Status – Stakeholder Process

PJM Response: This recommendation is being addressed by PJM Stakeholders within the real-time value discussions of the Operating Committee.

IMM Recommendation: The MMU recommends that Capacity Performance resources and base capacity resources (during the June through September period) be held to the OEM operating parameters of the capacity market CONE reference resource for performance assessment and energy uplift payments.

Status – Pending before the FERC

PJM Response: There are currently open rehearing requests at the FERC for Capacity Performance. PJM does not intend to take any further action until those rehearings are accepted or rejected. PJM has already taken joint action with the IMM to request that the FERC approve PJM's original filing on Capacity Performance.

IMM Recommendation: The MMU recommends that PJM remove non-specific fuel types such as “other” or “co-fire other” from the list of fuel types available for market participants to identify the fuel type associated with their price and cost schedules.

Status – Low Priority

PJM Response: PJM will investigate the technical changes required to implement this recommendation but feels that it is a low-priority issue.

IMM Recommendation: The MMU recommends that a unit which is not capable of supplying energy consistent with its day-ahead offer should reflect an appropriate outage rather than indicating its availability to supply energy on an emergency basis.

Status – No Further Action Planned; Rejected by the FERC

PJM Response: This recommendation is inconsistent with recent FERC rulings in the Capacity Performance docket where the FERC explicitly indicated that resources may continue to offer into the Real-Time Energy Market as Maximum Emergency.

IMM Recommendation: The MMU recommends that PJM explain how LMPs are calculated when demand response is marginal. The LMPs in excess of $1,800 per MWh on January 7, 2014, were potentially a result of the way in which PJM modeled zonal (not nodal) demand response as a marginal resource.

Status – Action Planned

PJM Response: PJM will post an example of the LMP calculation by the end of Q3 2016.

IMM Recommendation: The MMU recommends that PJM explicitly state its policy on the use of transmission penalty factors including the level of the penalty factors, the triggers for the use of the penalty factors, the appropriate line ratings to trigger the use of penalty factors, and when the transmission penalty factors will be used to set the shadow price.

Status – Action Planned

PJM Response: PJM does not use transmission penalty factors in price setting, and as a result, does not believe there is a need for additional information regarding their use. PJM will continue to work with the IMM to discuss transmission penalty factors and the calculation of transmission constraint shadow prices.

IMM Recommendation: The MMU recommends that PJM routinely review all transmission facility ratings and any changes to those ratings to ensure that the normal, emergency and load dump ratings used in modeling the transmission system are accurate and reflect standard ratings practice.

Status – Implemented/Stakeholder Process

PJM Response: PJM has implemented some internal review processes and has proposed audit changes to the Transmission Owners. This is currently being reviewed through the stakeholder process.

IMM Recommendation: The MMU recommends that the definition of maximum emergency status in the Tariff apply at all times rather than during maximum emergency events.

Status – No Further Action Planned; Rejected by the FERC

PJM Response: This change was included as part of PJM's Capacity Performance filing but was rejected by the FERC.

IMM Recommendation: The MMU recommends that PJM update the outage impact studies, the reliability analyses used in RPM for capacity deliverability and the reliability analyses used in RTEP for transmission upgrades to be consistent with

the more conservative emergency operations (post contingency load dump limit exceedance analysis) in the energy market that were implemented in June 2013.

Status – Action Planned

PJM Response: PJM is discussing this recommendation with the IMM to better understand the specific actions included in this recommendation.

IMM Recommendation: The MMU recommends that the roles of PJM and the transmission owners in the decision making process to control for local contingencies be clarified, that PJM's role be strengthened, and that the process be made transparent.

Status – Action Planned

PJM Response: PJM believes the roles of PJM and the transmission owners are clearly defined in Manual 3: Transmission Operations. PJM will work with the IMM to clarify specific concerns regarding this process.

IMM Recommendation: The MMU recommends that PJM include in the appropriate manual an explanation of the initial creation of hubs, the process for modifying hub definitions and a description of how hub definitions have changed.

Status – No Further Action Planned; PJM Concerns

PJM Response: Hubs are created at the suggestion of, and following discussion with, stakeholders. As such, the methodology for creating a particular hub is documented as it is created. Once a hub is created, hub definitions are not changed, and as such, there is no need to document the methodology.

IMM Recommendation: The MMU recommends that during hours when a generation bus shows a net withdrawal, the energy withdrawal be treated as load, not negative generation, for purposes of calculating load and load weighted LMP. The MMU recommends that during hours when a load bus shows a net injection, the energy injection be treated as generation, not negative load, for purposes of calculating generation and load-weighted LMP.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM disagrees with the first part of this recommendation and believes that when a generation bus is showing a net withdrawal, the payment should be the responsibility of the generation owner rather than affecting the load serving entities. While the State Estimator solution can occasionally result in injections at certain load buses, by definition there is no generator modeled at such a bus, and therefore no Market Seller to which to attribute actual generation injection. As such, the only feasible method by which to include such cases in the market settlements is to treat them as negative load at the particular load bus location.

IMM Recommendation: The MMU recommends that PJM identify and collect data on available behind the meter generation resources, including nodal location information and relevant operating parameters.

Status – Implemented

PJM Response: In 2015, PJM collected information regarding behind-the-meter generation with a capability over two MWs and made this information available to PJM dispatchers. PJM has also drafted manual changes (PJM Manual 3A) to incorporate EMS modeling guidelines for available behind-the-meter generation resources.

IMM Recommendation: The MMU recommends that PJM continue to enhance its posting of market data to promote market efficiency.

Status – Implemented

PJM Response: PJM continues to enhance market data and remains committed to transparency while not posting market sensitive data. In March 2016, PJM stakeholders endorsed several transparency-related enhancements. PJM suggests that the IMM provide specific details on any recommendations for further transparency enhancements.

IMM Recommendation: The MMU recommends the elimination of frequently mitigated unit and associated unit adders. Frequently mitigated units and associated unit adders no longer serve the purpose for which they were created and interfere with the efficient operation of PJM markets

Status – Implemented

PJM Response: PJM worked closely with the IMM to develop the joint proposal that was filed and accepted at the FERC. The change in the frequently mitigated unit rules was implemented in the fall of 2014. The *2015 State of the Market Report* notes that no units qualified for frequently mitigated unit status in 2015.

Energy Market Uplift Recommendations

The IMM has offered recommendations regarding Energy Market uplift. Many of the recommendations regarding Energy Market uplift are under discussion in the Energy Market Uplift Senior Task Force.

IMM Recommendation: The MMU recommends that PJM not use closed loop interface constraints to artificially override the nodal prices that are based on fundamental LMP logic in order to: accommodate rather than resolve the inadequacies of the demand side resource capacity product; address the inability of the power flow model to incorporate the need for reactive power; accommodate rather than resolve the flaws in PJM's approach to scarcity pricing; or for any other reason.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM establishes interfaces such as ATSI to ensure the correct pricing signal is sent to the market and to have the price of the marginal resource properly reflected. PJM believes it is critical for appropriate prices to be reflected in market outcomes. The issue was presented to the Market Implementation Committee and resulted in rule changes regarding when closed loop interfaces could be used.

IMM Recommendation: The MMU recommends that PJM not use price setting logic to artificially override the nodal prices that are based on fundamental LMP logic in order to reduce uplift.

Status – Action Planned

PJM Response: PJM does not agree with the characterization that prices are artificially overridden. PJM will discuss this recommendation with the IMM to better understand the issue.

IMM Recommendation: The MMU recommends that PJM initiate an analysis of the reasons why some combustion turbines and diesels scheduled in the Day-Ahead Energy Market are not called in real time when they are economic.

Status – Implemented

PJM Response: PJM has implemented procedures to closely monitor the long-lead time combustion turbines and diesels, and more consistently commit them in real time. PJM reviews unit commitment choices daily.

IMM Recommendation: The MMU recommends that PJM clearly identify and classify all reasons for incurring operating reserves in the Day-Ahead and Real-Time Energy Markets and the associated operating reserve charges in order for all market participants to be made aware of the reasons for these costs and to help ensure a long term solution to the issue of how to allocate the costs of operating reserves.

Status – Implemented

PJM Response: PJM implemented this recommendation in 2014.

IMM Recommendation: The MMU recommends that PJM revise the current operating reserve confidentiality rules in order to allow the disclosure of complete information about the level of operating reserve charges by unit and the detailed reasons for the level of operating reserve credits by unit in the PJM region.

Status – Implemented

PJM Response: In March 2016, stakeholders approved changes to confidentiality rules to allow the disclosure of operating reserve charges at a daily level by zone. Stakeholders were not broadly supportive of unit-level disclosure as this would have the potential to reveal confidential information. PJM also discussed plans to pilot additional transparency efforts in FERC docket AD 14-4.

IMM Recommendation: The MMU recommends the elimination of the day-ahead operating reserve category to ensure that units receive an energy uplift payment based on their real-time output and not their day-ahead scheduled output.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends reincorporating the use of net regulation revenues as an offset in the calculation of balancing operating reserve credits.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends not compensating self-scheduled units for their startup cost when the units are scheduled by PJM to start before the self-scheduled hours.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends that the lost opportunity cost in the Energy and Ancillary Services Markets be calculated using the schedule on which the unit was scheduled to run in the Energy Market.

Status – Implemented

PJM Response: PJM adopted this recommendation in 2015.

IMM Recommendation: The MMU recommends including no load and startup costs as part of the total avoided costs in the calculation of lost opportunity cost credits paid to combustion turbines and diesels scheduled in the Day-Ahead Energy Market but not committed in real time.

Status – Implemented

PJM Response: PJM implemented this recommendation in 2015.

IMM Recommendation: The MMU recommends using the entire offer curve and not a single point on the offer curve to calculate energy lost opportunity cost.

Status – Implemented

PJM Response: PJM implemented this recommendation in 2015.

IMM Recommendation: The MMU recommends calculating LOC based on segments of hours not on an hourly basis in the calculation of credits paid to combustion turbines and diesels scheduled in the Day-Ahead Energy Market but not committed in real time.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends that units scheduled in the Day-Ahead Energy Market and not committed in real time should be compensated for LOC based on their real time desired and achievable output, not their scheduled day-ahead output.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends that units scheduled in the Day-Ahead Energy Market and not committed in real time should be compensated for LOC incurred within an hour.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: This topic was discussed at the Energy Market Uplift Senior Task Force but stakeholders elected not to endorse this recommendation.

IMM Recommendation: The MMU recommends that only flexible fast start units (startup plus notification times of 30 minutes or less) and short minimum run time (one hour or less) be eligible by default for the LOC compensation to units scheduled in the Day-Ahead Energy Market and not committed in real time. Other units should be eligible for LOC compensation only if PJM explicitly cancels their day-ahead commitment.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: This topic was discussed at the Energy Market Uplift Senior Task Force but stakeholders elected not to endorse this recommendation. PJM continues to monitor CT commitments for units (startup plus notification times of 120 minutes or less) and short minimum run time (two hour or less) to minimize CT lost opportunity cost payments.

IMM Recommendation: The MMU recommends that up-to congestion transactions be required to pay operating reserve charges.

Status – Pending before the FERC

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends eliminating the use of internal bilateral transactions (IBTs) in the calculation of deviations used to allocate balancing operating reserve charges.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends allocating the energy uplift payments to units scheduled as must run in the Day-Ahead Energy Market for reasons other than voltage/reactive or black start services as a reliability charge to real-time load, real-time exports and real-time wheels.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends reallocating the operating reserve credits paid to units supporting the Con Edison – PJM Transmission Service Agreements.

Status – No Further Action Planned; PJM Concerns

PJM Response: The Con Edison – PSEG wheeling contract is now defined as a firm point-to-point transmission service transaction under the PJM Tariff. As such, PJM does not see how it would be possible to treat the allocation of operating reserve credits differently for this transaction than any other similar transaction in the market.PJM cannot unilaterally alter the terms of the wheeling agreement. Furthermore, this contract will expire on April 30, 2017.

IMM Recommendation: The MMU recommends that the total cost of providing reactive support be categorized and allocated as reactive services. Reactive services credits should be calculated consistent with the operating reserve credits calculation.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends including real-time exports and real-time wheels in the allocation of the cost of providing reactive support to the 500 kV system or above which is currently allocated to real-time RTO load.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

IMM Recommendation: The MMU recommends enhancing the current energy uplift allocation rules to reflect the elimination of day-ahead operating reserves, the timing of commitment decisions and the commitment reasons.

Status – Stakeholder Process

PJM Response: The Energy Market Uplift Senior Task Force that was originally charged with discussing this item has been on hiatus pending an order in a FERC 206 proceeding regarding the allocation of uplift to virtual transactions.

Capacity Market Recommendations

PJM believes, and the IMM has recognized, that many of the IMM's recommendations are addressed by the Capacity Performance enhancements to PJM's Reliability Pricing Model Capacity Market. PJM is focused on these improvements as a means of providing reliability in future years with appropriate incentives for reliability services in the face of an evolving landscape. These enhancements will address issues such as the changing role of natural gas fuels, more demanding winter operating conditions, and so on.

IMM Recommendation: The MMU recommends the enforcement of a consistent definition of capacity resource. The MMU recommends that the requirement to be a physical resource be enforced and enhanced. The requirement to be a physical resource should apply at the time of auctions and should also constitute a commitment to be physical in the relevant delivery year. The requirement to be a physical resource should be applied to all resource types, including planned generation, demand resources and imports.

Status – Implemented

PJM Response: PJM agrees with this recommendation and it was implemented as part of Capacity Performance.

IMM Recommendation: The MMU recommends that the test for determining modeled Locational Deliverability Areas in RPM be redefined. A detailed reliability analysis of all at risk units should be included in the redefined model.

Status – Implemented

PJM Response: PJM has studied at-risk units as part of the RTEP process over the past several years and has provided that information to stakeholders. PJM has also made substantive changes to LDA modeling assumptions to improve coordination between RPM and RTEP process. PJM currently identifies at-risk units and models LDAs where retirement of at-risk units would result in exceeding Capacity Emergency Transfer Limit (CETL) values. PJM will continue working with both the IMM and the stakeholders on refining the models.

IMM Recommendation: The MMU recommends that there be an explicit requirement that capacity resource offers in the Day-Ahead Energy Market be competitive, where competitive is defined to be the short run marginal cost of the units.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM disagrees with this recommendation. In the PJM market, capacity resources that are deemed to present a local market power risk (i.e. those that fail the three pivotal supplier test) are subject to market power mitigation at short-run marginal cost. PJM believes this recommendation would extend offer mitigation to all operating hours for any capacity resource, even when the resource has passed very conservative market power screens. PJM believes offer capping resources that have been deemed to satisfy market power screens is inconsistent with FERC's authority and action to grant market-based rates for resources in the energy market. PJM notes the analysis of market-based offers presented in the *2015 State of the Market Report* does not appear to support or justify this recommendation.

IMM Recommendation: The MMU recommends that clear, explicit operational protocols be defined for recalling the energy output of Capacity Resources when PJM is in an emergency condition. PJM has modified these protocols, but they need additional clarification and operational details.

Status – Low Priority

PJM Response: These protocols were developed in 2012 and are established in Manual 11. PJM believes these protocols are sufficient and has discussed them with IMM. PJM notes that the new protocols have never been exercised in real- time operations.

IMM Recommendation: The MMU recommends that the new revenue calculation used by PJM to calculate the new Cost of New Entry (CONE) variable resource requirement (VRR) parameter reflect the actual flexibility of units in responding to price signals rather than using assumed fixed operating blocks that are not a result of actual unit limitations. The result of reflecting the actual flexibility is higher net revenues, which affect the parameters of the RPM demand curve and market outcomes.

Status – Action Planned

PJM Response: The peak-period dispatch is a tariff-defined method of estimating the net energy and ancillary service revenues for the reference resource. PJM is not convinced that the IMM proposed method would provide a more accurate estimate of net energy and ancillary service revenues for a new combustion turbine. However, changes to this method could be investigated and considered as part of the quadrennial review process. PJM recommends that the IMM present analysis showing their proposed method provides a more accurate estimate than the current method prior to the next quadrennial review so that stakeholders can determine if this should be included as part of the scope of the next quadrennial review.

IMM Recommendation: The MMU recommends that modifications to existing resources not be treated as new resources for purposes of market power related offer caps or Minimum Offer Price Rule (MOPR) offer floors.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM does not agree with this recommendation. Proposed unit upgrades that increase capability should be treated no differently than a proposed unit for these purposes. Both may require the right price in order to determine whether to move forward with that project. PJM would be interested in learning more details to better understand the basis of this recommendation.

IMM Recommendation: The MMU recommends that, as part of the MOPR unit specific standard of review, all projects be required to use the same basic modeling assumptions. That is the only way to ensure that projects compete on the basis of actual costs rather than on the basis of modeling assumptions.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: PJM agrees with the goal expressed by the IMM that projects opting to use the unit-specific MOPR should compete on costs. But as the FERC has recently ordered on rehearing in the MOPR proceeding on unit specific, self-supply, and competitive entry exemptions and as memorialized in the tariff, new entrants may be able to compete on cost advantages related to financing, cost of equipment, engineering, procurement and construction contracts and the like. New entrants into PJM have found ways to reduce financing through different hedging mechanisms. So while some assumptions can be standardized in general (e.g. 20-year unit life), those standards need to be flexible enough to change to reflect realities that exist at the time a resource goes through the unit-specific process (e.g. cost and/or term of financing, actual expectations of inflation reflected in treasury bond prices, differences in equity return hurdle rates, etc.). There was an attempt to standardize assumptions through the stakeholder process in 2013; stakeholders were unable to achieve any consensus on what assumptions to standardize, or at what levels the standards should be set.

IMM Recommendation: The MMU recommends changing the RPM solution methodology to explicitly incorporate the cost of make-whole payments in the objective function.

Status – Implemented

PJM Response: PJM validates that each RPM auction solution is the least-cost bid-based solution, including the cost of make-whole in this validation.

IMM Recommendation: The MMU recommends changing the RPM solution methodology to define variables for the nesting relationships in the base residual auction optimization model directly rather than employing the current iterative approach, in order to improve the efficiency and stability.

Status – Implemented

PJM Response: The current PJM auction solution methodology provides a robust least-cost solution. The solution is timely, repeatable and verifiable.

IMM Recommendation: The MMU recommends that the use of the 2.5 percent demand adjustment (short term resource procurement target) be terminated immediately. The 2.5 percent should be added back to the overall market demand curve.

Status – Implemented

PJM Response: PJM implemented this recommendation with the introduction of Capacity Performance.

IMM Recommendation: The MMU recommends that the definition of demand side resources be modified in order to ensure that such resources be fully substitutable for other generation capacity resources. Both the limited and the extended summer demand response products should be eliminated in order to ensure that the demand response product has the same unlimited obligation to provide capacity year round as generation capacity resource.

Status – Implemented

PJM Response: PJM implemented this recommendation as part of the Capacity Performance changes.

IMM Recommendation: The MMU recommends that all capacity have firm transmission to the PJM border acquired prior to the offering in an RPM auction.

Status – Implemented

PJM Response: PJM implemented this recommendation as part of the Capacity Performance changes.

IMM Recommendation: The MMU recommends that all capacity imports be required to be pseudo tied prior to the relevant delivery year in order to ensure that imports are as close to full substitutes for internal, physical capacity resources as possible.

Status – Implemented

PJM Response: PJM implemented this recommendation as part of the Capacity Performance changes.

IMM Recommendation: The MMU recommends that all resources importing capacity into PJM accept a must offer requirement.

Status – Implemented

PJM Response: PJM implemented this recommendation as part of the Capacity Performance changes.

IMM Recommendation: The MMU recommends that generation capacity resources be paid on the basis of whether they produce energy when called upon during any of the hours defined as critical. One hundred percent of capacity market revenue should be at risk rather than only fifty percent.

Status – Implemented

PJM Response: PJM implemented this recommendation as part of the Capacity Performance changes.

IMM Recommendation: The MMU recommends that a unit which is not capable of supplying energy consistent with its day-ahead offer should reflect an appropriate outage.

Status – Pending before the FERC

PJM Response: PJM agrees with this recommendation. This topic is currently before the FERC.

IMM Recommendation: The MMU recommends that PJM eliminate all OMC outages from the calculation of forced outage rates used for any purpose in the PJM Capacity Market.

Status – Implemented

PJM Response: PJM agrees with this recommendation and implemented it as part of Capacity Performance.

IMM Recommendation: The MMU recommends that PJM eliminate the broad exception related to lack of gas during the winter period for single-fuel, natural gas-fired units.

Status – Implemented

PJM Response: PJM agrees with this recommendation and implemented it as part of Capacity Performance.

Demand Response Recommendations

The FERC's Order 745 has been controversial since its inception in 2011 and was challenged by the Electric Power Supply Association (EPSA) in 2012. On October 14, 2015, the Supreme Court of the United States heard the case and on

January 25, 2016 ruled to reverse the lower court ruling granting FERC the regulatory authority over compensation for demand response in the wholesale energy market. This ruling supports the continued participation of demand response in wholesale markets.

IMM Recommendation: The MMU recommends, as a preferred alternative to having PJM demand side programs, that demand response be on the demand side of the markets and that customers be able to avoid capacity and energy charges by not using capacity and energy at their discretion and that customer payments be determined only be metered load.

Status – Action Planned

PJM Response: PJM believes demand resources are an important part of a successful and efficient wholesale market. PJM will continue to work with our members and the IMM to enhance market rules and operational procedures for demand resources.

IMM Recommendation: The MMU recommends that there be only one demand response product, with an obligation to respond when called for all hours of the year, and that the demand response be on the demand side of the capacity market.

Status – Implemented

PJM Response: PJM partially agrees with this recommendation which led to the elimination of seasonal capacity products and 100 percent of the Capacity Performance requirement for 2020/2021 Delivery Year and beyond. PJM will continue to administer demand response as a supply resource to clear the auction, which, in effect will be similar to changing to the demand side (load forecast).

IMM Recommendation: The MMU recommends that the opinion to specify a minimum dispatch price under the emergency and pre-emergency program full option be eliminated and that participating resources receive the hourly real-time LMP less any generation component of their retail rate.

Status – No Further Action Planned; PJM Concerns

PJM Response: Reinforced by the Supreme Court ruling in the EPSA case, energy market compensation for demand resources at full LMP has been deemed just and reasonable and PJM does not intend to challenge that ruling at this time. PJM believes demand resources should set LMP when the resources are marginal to establish the correct price signal in the market, especially during emergency conditions.

IMM Recommendation: The MMU recommends that the emergency load response program be classified as an economic program, responding to economic price signals and not an emergency program responding only after an emergency is called and not triggering the definition of a PJM emergency.

Status – Implemented

PJM Response: PJM partially agrees with this recommendation and has created the pre-emergency demand response category for any demand response resource that does not require an emergency condition to respond. Pre-emergency demand response resources are dispatched to prevent full emergency conditions which may include loading maximum emergency generation.

IMM Recommendation: The MMU recommends that the emergency program energy only option be eliminated because the opportunity to receive the appropriate energy market incentive is already provided in the economic program.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: This recommendation was discussed with stakeholders and there was no support to eliminate this demand response participation option. This may be reconsidered in the future.

IMM Recommendation: The MMU recommends that a daily energy must offer requirement apply to demand resources, comparable to the rule applicable to generation capacity resources.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: PJM does not believe that a day-ahead, economic, must-offer requirement is necessary for demand resources because demand resources do not have the incentive to exert market power through physical withholding like generation resources do. The vast majority of demand resources only want to be dispatched if needed to prevent system emergencies and therefore will have a day-ahead price offer at the energy offer cap. If most demand resources are priced at the cap, it negates any significant benefit from participation in the Day-Ahead Energy Market and could complicate actual use of demand resources by dispatcher's discretion to manage emergency system conditions. Stakeholders discussed this as part of the Capacity Performance changes and determined this change was not necessary.

IMM Recommendation: The MMU recommends that the lead times for demand resources be shortened to 30 minutes with an hour minimum dispatch for all resources.

Status – Implemented

PJM Response: PJM has implemented these changes, effective 2014. Demand resources can request an exception from the 30-minute and 1-hour requirements for physical reasons.

IMM Recommendation: The MMU recommends that demand resources be required to provide their nodal location, comparable to generation resources.

Status – No Further Action Planned; Rejected by the FERC

PJM Response: Given the FERC's aggregation requirements, the implementation of nodal dispatch is not likely to be possible.

IMM Recommendation: The MMU recommends that PJM require nodal dispatch of demand resources with no advance notice required or, if nodal location is not required, subzonal dispatch of demand resources with no advance notice required.

Status – Implemented

PJM Response: PJM implemented rules by which it can create a sub-zone with no advance warning but can only assess capacity penalty if a sub-zone is created prior to the operating day. A nodal requirement was discussed with stakeholders during the demand response operational efficiency changes and it was decided by stakeholders with PJM agreement that sub-zonal dispatch for load management resources is adequate for PJM dispatch.

IMM Recommendation: The MMU recommends that PJM eliminate the measurement of compliance across zones within a compliance aggregation area.

Status – Implemented/No Further Action Planned

PJM Response: Compliance aggregation areas were eliminated as part of Capacity Performance changes. Capacity Performance changes do still provide for demand response to aggregate performance. PJM does not agree that aggregation should be limited to a zone and that performance aggregation should be limited to an emergency action area, if resources from one part of the grid will not help the issue in another part of the grid.

IMM Recommendation: The MMU recommends capping the baseline for measuring compliance under GLD, for the limited summer product, at the customers' PLC.

Status – Implemented

PJM Response: This recommendation has been implemented.

IMM Recommendation: The MMU recommends capping the baseline for measuring capacity compliance under winter compliance at customers' PLC, similar to GLD, to avoid double counting.

Status – No Further Action Planned; Rejected by the FERC

PJM Response: This recommendation is contrary to what stakeholders adopted under the Capacity Performance changes and is contrary to PJM and FERC arguments to support Capacity Performance changes. This recommendation would be contrary to the rules adopted by FERC.

IMM Recommendation: The MMU recommends that measurement and verification methods for demand resources be modified to reflect compliance more accurately.

Status – Implemented

PJM Response: PJM continues to enhance measurement and verification protocols and is a world leader in this area. For example, Japan recently adopted the PJM measurement and verification protocols as part of its market design since it is considered "best in class." In April 2015, the Members Committee endorsed residential measurement and verification enhancements to require load reductions to be determined based on sample interval meters deployed in the field instead of the prior method of using a static analysis that was in place for over 10 years and over-represented the capacity reductions in most cases.

IMM Recommendation: The MMU recommends that compliance rules be revised to include submittal of all necessary hourly load data, and that negative values be included when calculating event compliance across hours and registrations.

Status – Low Priority

PJM Response: PJM currently requires hourly meter load data be submitted for all participants. PJM does not agree with penalizing demand response participants when consumption is above the amount of capacity allocated since non-participants may also consume above the amount of capacity allocated. This would discriminate against those customers that participate as a demand response resource compared to those customers that do not participate. PJM has already implemented measurement and verification changes to only recognize reduction when load is below the amount of capacity allocated in the summer months.

IMM Recommendation: The MMU recommends that PJM adopt the ISO-NE five-minute metering requirements in order to ensure that dispatchers have the necessary information for reliability and that market payments to demand resources be calculated based on interval meter data at the site of the demand reductions.

Status – Low Priority

PJM Response: PJM will continue to review metering requirements as part of the sub-hourly settlement initiative but will not require resources to buy new metering equipment at this time. Retail participants currently do not have five-minute metering and are settled on a one-hour basis. It is not necessary for all resources to deploy new metering and support systems unless there is a clear and quantifiable benefit. Demand response resources currently report their hourly load reduction capability which is used to make dispatch decisions. ISO-NE dispatches its system differently from PJM, which has a much larger and more diverse portfolio of resources.

IMM Recommendation: The MMU recommends that demand response event compliance be calculated for each hour and the penalty structure reflect hourly compliance for the base and capacity performance products.

Status – Implemented

PJM Response: This was implemented as part of the Capacity Performance rule changes adopted by the FERC.

IMM Recommendation: The MMU recommends that demand resources whose load drop method is designated as "Other" explicitly record the method of load drop.

Status – Implemented

PJM Response: This recommendation has been implemented.

IMM Recommendation: The MMU recommends that load management testing be initiated by PJM with limited warning to Curtailment Service Providers (CSPs) in order to more accurately resemble the conditions of an emergency event.

Status – Low Priority

PJM Response: PJM agrees with the IMM but this is currently a low-priority item. This issue was reviewed at the Capacity Senior Task Force but eventually discontinued due to lack of stakeholder interest in addressing it.

IMM Recommendation: The MMU recommends that shutdown cost be defined as the cost to curtail load for a given period that does not vary with the measured reduction or, for behind the meter generators, be the start cost defined in Manual 15 for generators.

Status – Low Priority

PJM Response: Majority of demand response resources do not have a shutdown cost. The IMM has access to all PJM information and may always contact curtailment service providers to gain more information about shutdown cost if the IMM needs more information to support the values.

IMM Recommendation: The MMU recommends that the net benefits test be eliminated and that demand response resources be paid LMP less any generation component of the applicable retail rate.

Status – No Further Action Planned; Rejected by the FERC

PJM Response: The Supreme Court of the United States upheld the FERC's ability to regulate demand response in the wholesale market. The commission has determined that energy market consumption at full LMP is just and reasonable based upon the net benefits test as currently designed. PJM does not expect to challenge this decision in the near term.

IMM Recommendation: The MMU recommends that the tariff rules for demand response clarify that a resource and its CSP, if any, must notify PJM of material changes affecting the capability of the resource to perform as registered and to

terminate registrations that are no longer capable of responding to PJM dispatch directives because load has been reduced or eliminated, such as in the case of bankrupt and/or out of service facilities.

Status – No Further Action Planned; PJM Concerns

PJM Response: Curtailment Service Providers (CSPs) are currently obligated to withdraw registrations if a customer facility no longer has electricity service before the start of the delivery year. If a customer facility has no electricity service during the delivery year the CSPs may not report load reductions considering there is no electricity service at the facility. CSPs are required to report to PJM expected real-time load reductions so that PJM dispatchers can incorporate into dispatch decisions.

Interchange Transactions Recommendations

The IMM has offered recommendations regarding interchange transactions.

IMM Recommendation: The MMU recommends that PJM eliminate the IMO interface pricing point, and assign the transactions that originate or sink in the IESO balancing authority to the MISO interface pricing point.

Status – Implemented/No Further Action Planned

PJM Response: PJM implemented a new IMO (Ontario – Independent Electricity Market Operator) interface price definition and created a new Ontario aggregate pricing point on June 1, 2015, that resolves this concern. The IMM recommendation would result in inconsistent pricing for transactions to/from IMO that do not flow entirely through MISO.

IMM Recommendation: The MMU recommends that PJM monitor, and adjust as necessary, the weights applied to the components of the interfaces to ensure that the interface prices reflect ongoing changes in system conditions. The MMU also recommends that PJM review the mappings of external balancing authorities to individual interface pricing points to reflect changes to the impact of the external power source on PJM tie lines as a result of system topology changes. The MMU recommends that this review occur at least annually.

Status – Low Priority

PJM Response: PJM agrees in concept with both recommendations and will review the process to evaluate the balancing authority mappings with some periodicity, as well as assess whether a change is necessary with the interface bus pnode mappings.

IMM Recommendation: The MMU recommends that the submission deadline for real-time dispatchable transactions be modified from 1800 on the day prior, to three hours prior to the requested start time, and that the minimum duration be modified from one hour to 15 minutes. These changes would give PJM a more flexible product that could be used to meet load in the most economic manner.

Status – Implemented/Stakeholder Process

PJM Response: This topic has been addressed within the coordinated transaction scheduling product and minimum duration has already been modified to 15 minutes as a result of PJM's response to the FERC Order 764.

IMM Recommendation: The MMU recommends that PJM explore an interchange optimization solution with its neighboring balancing authorities that would remove the need for market participants to schedule physical transactions across seams. Such a solution would include an optimized, but limited, joint dispatch approach that uses supply curves and treats seams between balancing authorities as constraints, similar to other constraints within an LMP market.

Status – Stakeholder Process

PJM Response: The Joint and Common Market initiative continues to look for opportunities to enhance the operation and coordination of markets across seams. Coordinated transaction scheduling was implemented with NYISO in November 2014. An interchange optimization proposal with MISO was developed and approved by PJM stakeholders, and filed with the FERC in December 2015. In April 2016, the FERC approved the proposal with an implementation date for March 2017.

IMM Recommendation: The MMU recommends that PJM permit unlimited spot market imports as well as unlimited non-firm point-to-point willing to pay congestion imports and exports at all PJM Interfaces in order to improve the efficiency of the market.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: PJM is working with stakeholders in the Market Implementation Committee on a problem statement (Spot-in Transmission Service for Energy Imports from NYISO) to address some of these concerns.

IMM Recommendation: The MMU recommends that PJM implement a validation method for submitted transactions that would prohibit market participants from breaking transactions into smaller segments to defeat the interface pricing rule by concealing the true source or sink of the transaction.

Status – Implemented/No Further Action Planned

PJM Response: In July 2014, PJM and the IMM issued a joint statement on interchange scheduling which addresses partial path scheduling and the belief that this type of scheduling could be subject to referral by the IMM. At this time, PJM does not believe there is a need to implement a validation method that attempts to identify partial path schedules.

IMM Recommendation: The MMU recommends that PJM implement a validation method for submitted transaction that would require market participants to submit transactions on market paths that reflect the expected actual power flow in order to reduce unscheduled loop flows.

Status – Stakeholder Process

PJM Response: The IMM previously presented a problem statement at the Market Implementation Committee. PJM staff does not believe there is a problem with PJM's interface pricing nor does staff see a need to implement a path restriction similar to what NYISO has done. The IMM has presented a list of paths it believes to be problematic to stakeholders at the Market Implementation Committee. PJM staff has evaluated this list and is meeting with the IMM during the second quarter of 2016 to discuss and address this recommendation.

IMM Recommendation: The MMU recommends that PJM implement rules to prevent sham scheduling. The MMU's proposed validation rules would address sham scheduling.

Status – Stakeholder Process

PJM Response: The IMM has presented information to stakeholders at the Market Implementation Committee but to date has not presented a formal problem statement. PJM staff does not believe there is an overarching problem with PJM's interface pricing. The IMM has been supportive of PJM's proposed change to the IMO interface pricing point definition and PJM has agreed to work with the IMM regarding paths the IMM may identify for which transaction pricing should be adjusted.

IMM Recommendation: The MMU requests that, in order to permit a complete analysis of loop flow, FERC and NERC ensure that the identified data are made available to market monitors as well as other industry entities determined appropriate by FERC.

Status – No Further Action Planned; Outside PJM control

PJM Response: PJM supports the IMM's request that all identified data needed to conduct a complete loop flow analysis be made available to the market monitors as well as other industry entities determined appropriate by the FERC.

IMM Recommendation: The MMU recommends that PJM implement additional business rules to remove the incentive to engage in sham scheduling activities using the PJM/IMO interface price.

Status – Implemented

PJM Response: PJM implemented a new IMO interface definition in June 2015, which is a combination of the MISO and NYISO interface prices and dependent upon the relationship between the scheduled and actual flows over the Michigan/Ontario phase angle regulators.

IMM Recommendation: The MMU recommends that PJM eliminate the NIPSCO, Southeast and Southwest interface pricing points from the Day-Ahead and Real-Time Energy Markets and, with VACAR, assign the transactions created under the reserve sharing agreement to the South IMP/EXP pricing point.

Status – Low Priority

PJM Response: PJM supports the recommendation to remove the NIPSCO and Southeast interface pricing points from the Day-Ahead and Real-Time Energy Markets. Given that neither of these interface pricing points can be used for real-time transactions, there is no need to have them available for day-ahead transactions. However, since there are existing, long-term FTR positions at the NIPSCO interface pricing point, PJM is required to establish a day-ahead price at which they are settled. PJM continues to believe that the Southeast interface pricing point is the applicable point for settling VACAR reserve sharing agreement energy transfers. PJM would need to investigate with stakeholders whether any rule or agreement changes would be required in order to continue to calculate these interface prices but make them ineligible for day ahead, real time and virtual transactions.

IMM Recommendation: The MMU recommends that PJM immediately provide the required 12-month notice to Duke Energy Progress (DEP) to unilaterally terminate the Joint Operating Agreement.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM does not agree with the recommendation to terminate the PJM/PEC Joint Operating Agreement prior to renegotiating a new joint agreement. PJM concurs that updates and improvements to the agreement may be required and will continue to seek opportunities to work with Duke Energy Progress to update the agreement.

IMM Recommendation: The MMU recommends that PJM and MISO work together to align interface pricing definitions, using the same number of external buses and selecting buses in close proximity on either side of the border with comparable bus weights.

Status – Stakeholder Process

PJM Response: PJM agrees with this recommendation. This item is currently under discussion in the Joint and Common Market stakeholder process. PJM continues to work with the MISO IMM and PJM and MISO Stakeholders to resolve interface pricing issues and improve the alignment of interface price definitions.

IMM Recommendation: The MMU recommends that PJMSettlement Inc. immediately request a credit evaluation from all companies who engaged in up to congestion transactions between September 8, 2014 and December 31, 2015. If PJM has the authority, PJM should ensure that the potential exposure to uplift for that period be included as a contingency in the companies' calculations for credit levels and/or collateral requirements. If PJM does not have the authority to take such steps, PJM should request guidance from FERC.

Status – Pending before the FERC

PJM Response: PJM does not agree that additional credit evaluations or "contingency" credit requirements are appropriate for this matter before the commission rules on the FERC-initiated docket on potential uplift charges on up-to-congestion transactions. PJM Settlement already performs ongoing credit evaluations of all PJM members participating in the markets PJM administers. PJM's credit policy in Attachment Q of the tariff does not authorize PJM Settlement to include a "contingency" in members' credit requirements. PJM Settlement does have the ability to modify a member's credit requirement to reflect "known and measurable" changes in the activity or expected charges or credits for a member. PJM is monitoring the open FERC docket that may result in additional fees being charged to up-to-congestion transactions, with the potential of retroactive action dating back to the fall of 2014, and has filed a joint letter with the IMM requesting action from the FERC in this docket. In the opinion of PJM Settlement, the possible outcomes of this FERC docket are not yet "known and measurable." It is not known when the FERC will rule in this docket, what the FERC ruling might be, what uplift fees might be assigned to up-to-congestion transactions, or whether any such potential fees would be applied retroactively or prospectively. PJM Settlement will continue to monitor this FERC proceeding, review the FERC ruling in this docket when issued, and modify members' credit requirements as appropriate for the implications of the order.

IMM Recommendation: The MMU recommends that the emergency interchange cap be replaced with a market based solution.

Status – Low Priority

PJM Response: Although PJM is supportive of this recommendation, this item is currently low priority.

Ancillary Services Recommendations

The IMM has offered recommendations regarding ancillary services.

IMM Recommendation: The MMU recommends that the Regulation Market be modified to incorporate a consistent application of the marginal benefit factor throughout the optimization, assignment and settlement process.

Status – Stakeholder Process

PJM Response: PJM agrees with this recommendation. Rulings by the FERC, however, have prevented application of the marginal benefits factor. This topic is currently under discussion in the Regulation Market Impacts Senior Task Force (RMISTF).

IMM Recommendation: The MMU recommends a number of market design changes to improve the performance of the Regulation Market, including use of single clearing price based on actual LMP, modifications to the LOC calculation

methodology, a software change to save some data elements necessary for verifying market outcomes, and further documentation of the implementation of the market design through SPREGO.

Status – Implemented/Stakeholder Process

PJM Response: PJM has partially adopted this recommendation. The portions that have not yet been adopted are under discussion in the Regulation Market Impacts Senior Task Force (RMISTF).

IMM Recommendation: The MMU recommends that the lost opportunity cost in the ancillary services markets be calculated using the schedule in which the unit was scheduled to run in the energy market.

Status – Stakeholder Process

PJM Response: PJM agrees with this recommendation. This topic is currently under discussion at the Regulation Market Impacts Senior Task Force (RMISTF).

IMM Recommendation: The MMU recommends that the single clearing price for synchronized reserves be determined based on actual LMP and not the forecast LMP.

Status – Implemented

PJM Response: PJM implemented this recommendation.

IMM Recommendation: The MMU recommends that the rule requiring the payment of Tier 1 synchronized reserve resources when the non-synchronized reserve price is above zero be eliminated immediately.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: This topic was addressed at the Market Implementation Committee. Stakeholders discussed this issue and submitted a proposal to eliminate payment for Tier 1 synchronized reserve resources when the non-synchronized reserve price is above zero. Both the PJM and IMM proposals were not endorsed as stakeholders opted to remain with the current rules.

IMM Recommendation: The MMU recommends that no payments be made to Tier 1 resources if they are deselected in the PJM market solution. The MMU also recommends that documentation of the Tier 1 synchronized reserve deselection process be published.

Status – Implemented

PJM Response: PJM implemented this recommendation.

IMM Recommendation: The MMU recommends that the Tier 2 synchronized reserve must-offer requirement be enforced. The MMU recommends that PJM define a set of acceptable reasons why a unit can be made unavailable daily or hourly and require operators to select a reason in eMKT whenever making a unit unavailable.

Status – Action Planned/Low Priority

PJM Response: PJM will monitor, for compliance purposes, Tier 2 resources that do not meet the must-offer requirement. The second portion of this recommendation is low priority. Currently, acceptable reasons for why a unit is unavailable daily or hourly do not exist, but if defined and built into Markets Gateway, it would be the participant's responsibility to select the reason why the unit is unavailable for synchronized reserve.

IMM Recommendation: The MMU recommends that PJM be explicit about why Tier 1 biasing is used in the optimized solution to the Tier 2 Synchronized Reserve Market. The MMU recommends that PJM define explicit rules for the use of Tier 1 biasing during any phase of the market solution and identify the relevant rule for each instance of biasing.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM continues to improve the calculation of Tier 1 reserves. However, PJM believes that dispatcher discretion and experience are critical tools used in maintaining system reliability and it is impossible to set rigid rules in this area without sacrificing reliability.

IMM Recommendation: The MMU recommends that PJM replace the DASR Market with a real-time secondary reserve product that is available and dispatchable in real time.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM believes that the current Day-Ahead Scheduling Reserve Market results in scheduling the required resources to be operating in real time, and that a real-time market for purpose of securing supplemental reserve during the operating day is necessary. Additionally, PJM discussed creating a real-time operating reserve market as part of the Energy Reserve Pricing and Interchange Volatility (ERPIV) discussions in the Market Implementation Committee, but the proposal did not gain sufficient support for the members to vote on it.

IMM Recommendation: The MMU recommends that PJM revise the current confidentiality rules in order to specifically allow a more transparent disclosure of information regarding black start resources and their associated payments in PJM.

Status – No Further Action Planned; PJM Concerns

PJM Response: The FERC and NERC rules regarding critical energy infrastructure information will limit the information that may be disclosed on this topic. PJM has repeatedly made the IMM aware of this issue and requested specific clarification on what disclosures the IMM believes would be valuable while still conforming to federal regulations. To date, the IMM has not provided any further detail on this topic.

IMM Recommendation: The MMU recommends that the three pivotal-supplier test and market power mitigation be incorporated in the DASR Market.

Status – Low Priority

PJM Response: Given the near-zero clearing prices and minimal impact of the Day-Ahead Scheduling Reserve Market, PJM believes this is a low priority.

IMM Recommendation: The MMU recommends that a reason code be attached to every hour in which PJM market operations adds additional DASR MW.

Status – Low Priority

PJM Response: PJM believes this will likely add little value. PJM increases the Day-Ahead Scheduling Reserve Market requirement when a hot weather alert, cold weather alert or escalated emergency conditions, or if dispatchers have scheduled additional resources for reserves in anticipation of such conditions. PJM has only increased the requirement during a hot weather or cold weather alert. These requirements are documented in the PJM Manual 13: Emergency Procedures. In addition, PJM staff reviews occurrences of increased DASR at the Operating Committee.

Generation and Transmission Planning Recommendations

The IMM has offered recommendations regarding generation and transmission planning.

IMM Recommendation: The MMU recommends that PJM continue to incorporate the principle that the goal of transmission planning should be the incorporation of transmission investment decisions into market driven processes as much as possible.

Status – Implemented

PJM Response: Planning considers investment decisions made in the market by including generation and merchant transmission investment decisions once Interconnection Service Agreements have been executed. Additionally, PJM is committed to improving the quality and timeliness of available information so that the market can make investment decisions given the uncertainty and long lead times involved in both transmission and resource planning.

IMM Recommendation: The MMU recommends the creation of a mechanism to permit a direct comparison, or competition, between transmission and generation alternatives, including which alternative is less costly and who bears the risks associated with each alternative.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: PJM agrees and is supportive of direct resource competition. PJM is committed to improving the available information so the market can have the best information to make investment decisions given the uncertainty and long-lead times involved in resource planning. This concept was examined during stakeholder discussions related to FERC Order 1000 but stakeholders had no strong interest in exploring this concept further.

IMM Recommendation: The MMU recommends that rules be implemented to permit competition to provide financing for transmission projects. This competition could reduce the cost of capital for transmission projects and significantly reduce total costs to customers.

Status – No Further Action Planned; Outside PJM Control

PJM Response: Such a construct would require careful consideration to prevent any unintended consequences. A change of this nature is not a short-term fix but instead a long-term effort that will require many years to implement and would have to be undertaken by the FERC. PJM is currently reviewing lessons learned from the current implementation of FERC Order 1000 including the use of cost containment options. PJM will continue to consider all options to improve the process.

IMM Recommendation: The MMU recommends that rules be implemented to require that project cost caps on new transmission projects be part of the evaluation of competing projects.

Status – Implemented

PJM Response: Project cost caps are part of the evaluation of competing proposals. However, PJM cannot compel an entry to commit to a cost cap.

IMM Recommendation: The MMU recommends that barriers to entry be addressed in a timely manner in order to help ensure that the capacity market will result in the entry of new capacity to meet the needs of PJM market participants and reflect uncertainty and resultant risks in the cost of new entry used to establish the capacity market demand curve in RPM.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM agrees that unjust and unreasonable impediments to entry of new generating resources should be eliminated to the extent possible. Unfortunately, labeling a market feature as a "barrier" does not specify or provide the analysis to determine if a particular market design feature is unjust and unreasonable. PJM notes the IMM did not provide specific concerns related to this recommendation; specific details and analysis supporting the recommendation would be helpful to PJM and stakeholders seeking to understand the issue. PJM is committed to working with the IMM and the PJM membership to reduce any potential barriers to new generation entry.

IMM Recommendation: The MMU recommends that the question of whether Capacity Injection Rights (CIRs) should persist after the retirement of a unit be addressed. Even if the treatment of CIRs remains unchanged, the rules need to ensure that incumbents cannot exploit control of CIRs to block or postpone entry of competitors.

Status – Implemented/No Further Action Planned; No Stakeholder Consensus

PJM Response: The Interconnection Process Senior Task Force implemented several rule modifications that reduced or eliminated issues relating to existing capacity injection rights (CIRs). The revised CIR transfer rules reduced the period of time that incumbent CIR holders can hold onto them without acting from three years to one year after deactivation. The new CIR transfer rules struck a balance between reducing the time an incumbent can hold their existing rights while still allowing the incumbent CIR holders the ability to continue to use their rights through timely entering the interconnection queue process to add new generation using those rights, or modifying their existing facility to reuse the CIRs. PJM does not feel any further changes are warranted at this time.

IMM Recommendation: The MMU recommends outsourcing interconnection studies to an independent party to avoid potential conflicts of interest. Currently, these studies are performed by incumbent transmission owners under PJM's direction. This creates potential conflicts of interest, particularly when transmission owners are vertically integrated and the owner of transmission also owns generation.

Status – Action Planned

PJM Response: PJM disagrees with the IMM's characterization of the responsibilities in this area. These studies are not performed by incumbent transmission owners under PJM's direction. They are performed by PJM with the support of the incumbent transmission owner. Transmission owners are required to provide the upgrades necessary to correct any violations found during the studies which may require some analysis. PJM is currently discussing with some transmission owners the feasibility of contracting this work to a third party.

IMM Recommendation: The MMU recommends improvements in queue management including that PJM establish a review process to ensure that projects are removed from the queue if they are not viable, as well as a process to allow commercially viable projects to advance in the queue ahead of projects which have failed to make progress, subject to rules to prevent gaming.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: Provided that a project is meeting the financial milestones required, PJM has limited information to know when a project is no longer planned to be completed by the developer. Stakeholders considered changes to the queue process in the Interconnection Process Senior Task Force. While some rule changes resulted from these discussions, stakeholders specifically rejected this idea as it could cause significant disruption to the queue. PJM has made changes to move queue submissions to the next queue when excessive project changes are received. Additionally, PJM will be seeking further changes to move projects to the next queue when submitted requests are incomplete and cannot be resolved by the close of the queue window.

IMM Recommendation: The MMU recommends an analysis of the study phase of PJM's transmission planning to reduce the need for postponements of study results, to decrease study completion times, and to improve the likelihood that a project at a given phase in the study process will successfully go into service.

Status – Implemented/Action Planned

PJM Response: PJM believes the IMM is referring to interconnection studies in this recommendation. In recent years, PJM has implemented process improvements that have drastically reduced study backlog, improved on-time performance and reduced the age of backlog studies. At the end of 2015 there were only 13 feasibility or impact studies that were overdue, with the average timeframe being approximately three months. PJM remains committed to on-going process improvements in this area.

IMM Recommendation: The MMU recommends that PJM establish fair terms of access to rights of way and property, such as at substations, in order to remove any barriers to entry and permit competition between incumbent transmission providers and merchant transmission providers in RTEP.

Status – No Further Action Planned; Outside of PJM Control

PJM Response: This recommendation addresses issues of property rights and legal matters beyond PJM's purview. PJM has no ability to compel transmission owners to forgo their legally established property rights. PJM is not aware of any issues in 2015 that this recommendation would have addressed had it been implemented. PJM will continue further discussion with the IMM to understand specific concerns.

IMM Recommendation: The MMU recommends that PJM enhance the transparency and queue management process for merchant transmission investment. Issues related to data access and complete explanations of cost impacts should be addressed. The goal should be to remove barriers to competition from merchant transmission.

Status – Action Planned

PJM Response: PJM believes this recommendation is referring to the Incremental Auction Revenue Rights (IARRs) request process and not merchant transmission investment. PJM will engage the IMM to understand ways to improve transparency, and provide additional information for stakeholders to better understand how PJM performs the simultaneous feasibility studies that are required for entities seeking IARRs.

IMM Recommendation: The MMU recommends consideration of changing the minimum distribution factor in the allocation from .01 to .00 and adding a threshold minimum impact on the load of the line.

Status – No Further Action Planned; Outside of PJM Control

PJM Response: Changing the minimum distribution factor is within the purview of the transmission owners. Generally, PJM does not agree that the distribution factors threshold should be eliminated. There may be some combination of thresholds that could be effective, but PJM cannot implement such changes.

IMM Recommendation: The MMU recommends that PJM reevaluate transmission outage tickets as on time or late as if they were new requests when an outage is rescheduled and apply the standard rules for late submissions to any such outages.

Status – Implemented

PJM Response: PJM currently reviews rescheduled transmission outages to verify they do not cause congestion or reliability issues or violate on-time submittal rules. PJM re-studies all the rescheduled outage requests during the

near-term outage study process, which includes three-day-ahead study, two-day-ahead study and one-day-ahead study. If an outage is rescheduled to a future month, it will also be re-studied during PJM's one-month-ahead study process. PJM only approves "on time" outages if they do not jeopardize the reliability of the PJM system. PJM makes the final outage approval decision two days before the requested start of the outage.

IMM Recommendation: The MMU recommends that PJM draft a clear definition of the congestion analysis required for transmission outage requests to include in Manual 3 after appropriate review.

Status – Action Planned

PJM Response: PJM will draft a new manual section on Transmission Outage Study Congestion Analysis. This section will define the procedure used to determine whether a transmission outage request will potentially cause congestion. PJM will insert this new section into the appropriate manual by the third quarter of 2016.

IMM Recommendation: The MMU recommends that PJM modify the rules to reduce or eliminate the approval of late outage requests submitted or rescheduled after the FTR auction bidding opening date.

Status – Implemented

PJM Response: The current PJM outage submission rules require all long-duration transmission outages (exceeding 30 days during the following planning year) be submitted before February 1. For long-duration outages submitted after February 1, in additional to the normal outage congestion analysis, there is an internal PJM process for Operations Planning to notify Market Simulation to perform further FTR evaluation on those specific outage requests. PJM will not approve any late long-duration outage requests if they have negative impacts on FTR.

IMM Recommendation: The MMU recommends that PJM not permit transmission owners to divide long duration outages into smaller segments to avoid complying with the requirements for long duration outages.

Status – Implemented

PJM Response: PJM discussed having multiple scheduled outages on the same equipment with PJM stakeholders in 2015. After the discussion, PJM recognized there are legitimate situations when outages on the same equipment cannot be planned in advance as a single outage. In lieu of rule changes, PJM has begun monitoring outage scheduling behavior and applying appropriate outage frequency tests on a periodic basis. If questionable outage scheduling behavior is noticed, PJM will work with the transmission owner and/or IMM to address the issue.

FTR and ARR Recommendations

The IMM has offered recommendations regarding FTRs and ARRs.

IMM Recommendation: The MMU recommends that the ARR/FTR design be modified to ensure that all congestion revenues are returned to load.

Status – No Further Action Planned; PJM Concerns

PJM Response: PJM disagrees with this recommendation. A thorough discussion on this issue can be found in the introduction section of this document.

IMM Recommendation: The MMU recommends all FTR auction revenue be distributed to ARR holders.

Status – No Further Action Planned; PJM Concerns

PJM Response: Auction revenues are distributed to ARR holders up to the amount necessary to fully fund the ARR target allocations. Excess auction revenues are allocated to FTR holders. PJM does not support allocating excess auction revenues to ARR holders because the ARR holders are already fully funded and the excess should be used to fund FTRs.

IMM Recommendation: The MMU recommends that historical generation to load paths be eliminated as a basis for allocating ARRs.

Status – Pending before the FERC

PJM Response: PJM disagrees with this recommendation. Historical generation-to-load paths are important to load serving entities and need to be available to support the long-term contracts. However, PJM does think the historical generation resources that are no longer in service should be updated with more recent available resources. After a recent technical conference, the FERC is considering this topic.

IMM Recommendation: The MMU recommends that counter flow FTRs be eliminated.

Status – Pending before the FERC

PJM Response: PJM disagrees with this recommendation. Counter flow FTRs are important to the market as they provide liquidity and an offset to prevailing flow FTRs used by load to hedge congestion. However, rather than sourcing and sinking at individual load locations where load is not settled, PJM believes a beneficial design change would be to align FTR sources and sinks to nodes where generation, load or interchange transactions are settled, or at trading hubs. This change would better align the use of FTRs from non-LSEs with anticipated, physical, transmission system usage in the Day-Ahead Market. After a recent technical conference, the FERC is considering this topic.

IMM Recommendation: The MMU recommends that FTR auction revenues not be used to buy counter flow FTRs with the purpose of improving FTR payout ratios.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: PJM stakeholders approved the use of FTR auction revenues to buy counter flow FTRs in 2014 to help improve FTR Revenue adequacy as it gives PJM the ability to reduce or remove infeasible rights by allowing additional counter-flow FTRs to clear in an auction.

IMM Recommendation: The MMU recommends that PJM report correct monthly payout ratios to reduce understatement of payout ratios on a monthly basis.

Status – Implemented

PJM Response: This recommendation will be implemented effective June 1, 2016.

IMM Recommendation: The MMU recommends that PJM eliminate portfolio netting to eliminate cross subsidies among FTR marketplace participants.

Status – Pending before the FERC

PJM Response: PJM agrees that elimination of portfolio netting will more equitably reflect the impact of negatively valued FTRs on all participants' positively valued FTR funding results. The IMM recommendation would not change

the total PJM FTR payout dollars but will change the payout dollars for individual FTR participants. After a recent technical conference, the FERC is considering this topic.

IMM Recommendation: The MMU recommends that PJM eliminate subsidies to counter flow FTRs by applying the payout ratio to counter flow FTRs in the same way the payout ratio is applied to prevailing flow FTRs.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: PJM believes that charging negatively valued FTRs more than 100 percent of their negative value would amount to those negatively valued FTRs subsidizing the payments to positively valued FTRs. PJM does not believe such a subsidy is justified.

IMM Recommendation: The MMU recommends that PJM eliminate geographic cross subsidies.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: PJM disagrees with this recommendation. In recommending the elimination of cross-geographic subsidies, the IMM is suggesting that FTR underfunding be allocated to those FTR holders whose FTRs are across paths where the constraints causing the underfunding occurred. Changing the allocation mechanism for FTR underfunding such that revenue inadequacy was allocated to participants whose FTRs impacted transmission constraints that drove the underfunding would be directly akin to "undoing" the ARR allocation(s) and/or FTR auction(s) through which the ARRs and FTRs were allocated or sold. PJM stakeholders considered this recommendation and did not approve implementing it.

IMM Recommendation: The MMU recommends that PJM improve transmission outage modeling in the FTR auction models.

Status – Implemented

PJM Response: PJM believes it has already addressed this recommendation through auction models and the modeling changes have resulted in improved FTR revenue adequacy.

IMM Recommendation: The MMU recommends that PJM reduce FTR sales on paths with persistent over-allocation of FTRs including clear rules for what defines persistent overall location and how the reduction will be applied.

Status – Implemented

PJM Response: The PJM Tariff already provides PJM with the necessary authority to model the transmission system with the reduced capability necessary to minimize underfunding of FTRs. Therefore, PJM already reduces the capability modeled in the FTR auctions on historically constrained and underfunded paths to the greatest extent possible. These modeling changes have resulted in improved FTR revenue adequacy.

IMM Recommendation: The MMU recommends that PJM implement a seasonal ARR and FTR allocation system to better represent outages.

Status – No Further Action Planned; No Stakeholder Consensus

PJM Response: PJM has discussed this recommendation on multiple occasions with PJM stakeholders. Stakeholders have not expressed an interest in these forums to change from an annual model to a seasonal one. PJM does not believe this will have a significant impact on FTR revenue adequacy.

IMM Recommendation: The MMU recommends that the basis for the Stage 1A assignments be reviewed and made explicit, that the role of out-of-date generation to load paths be reviewed and that the building of the transmission capability required to provide all defined Stage 1A allocations be reviewed.

Status – Pending before the FERC

PJM Response: PJM partially agrees with this recommendation. PJM believes historical generation resources that are no longer in service should be updated with more recent available resources. The 10-year Stage 1A process for transmission upgrades to support long-term rights has been reviewed with stakeholders and a change to increase the load growth assumption in this analysis via a 1.5 percent adder is pending before the FERC. After a recent technical conference, the FERC is considering this topic.

IMM Recommendation: The MMU recommends that PJM apply the FTR forfeiture rule to up-to-congestion transactions consistent with the application of the FTR forfeiture rule to increment offers and decrement bids.

Status – Pending before the FERC

PJM Response: PJM believes it is already applying the FTR Forfeiture consistent between INC/DECs and up-to congestions transactions (UTCs). However, UTCs are a path and INC/DEC are single injection or withdrawal points. Therefore, the FTR forfeiture rule must apply on a path basis for UTCs. After a recent technical conference, the FERC is considering this topic.

IMM Recommendation: The MMU recommends that PJM examine the mechanism by which self-scheduled FTRs are allocated when load switching among LSEs occurs throughout the planning period.

Status – Low Priority

PJM Response: Although self-scheduled FTRs do not follow load shifts, ARRs do shift between LSEs when load shifts. Therefore, PJM believes this is low priority with small impact.