



# **Exelon/PSEG Merger Analysis Supplemental Report**

PJM Market Monitoring Unit

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## ***Introduction***

This supplemental report was prepared by PJM's Market Monitoring Unit (MMU) in response to a request from the New Jersey Board of Public Utilities. The supplemental report clarifies the purpose and results of the results included in the initial MMU report. In particular, the supplemental report addresses the methods used in the initial report as well as the level and characteristics of mitigation in the form of divestiture that would be required in order to return the market structure measures to pre-merger levels and to levels consistent with Department of Justice (DOJ) Guidelines.

## ***Scope and Conclusions of MMU Report***

The MMU report was neither a commentary on the merits of the Applicants' merger filing and supporting testimony, nor was it an effort to validate or refute the conclusions drawn therein. The MMU analysis did reach one conclusion similar to that reached by Dr. Hieronymous in that the proposed merger is large and the potential impacts on the PJM markets are significant. The MMU report did not review the accuracy or methods employed by Dr. Hieronymus or any intervenor, but rather presented an independent analysis in response to the request by the New Jersey Board of Public Utilities. The conclusions presented in the MMU report should be taken directly from the report rather than from an interpretation and restatement by another party. Those conclusions remain unchanged.

The key conclusions reached in the MMU report were that, absent appropriately designed mitigation, the proposed merger would significantly increase concentration in the Energy, Capacity and Regulation markets and therefore raises concerns about potential adverse competitive effects, absent mitigation, based on the Department of Justice Horizontal Merger Guidelines and the Federal Energy Regulatory Commission's Merger Guidelines. The report also concluded that mitigation can be designed to resolve the identified issues but that designing and implementing effective mitigation is a complex task because the impact of the proposed divestitures depends on the identification of the units to be divested, on the characteristics of the entities purchasing the divested units and on the nature of the divestiture.

Given the identified sensitivity of any proposed mitigation plan to the identification of the specific units and the market characteristics of the buyers permitted to purchase divested assets, these facts should be considered in any analysis of the efficacy of the mitigation plan. The MMU is prepared to do such analysis or to provide the relevant data to the Commission (FERC).

## ***MMU Conclusions Regarding Applicants' Divestiture Proposal***

The MMU conclusion that it was possible to return HHI to pre-merger levels within the scope of the Applicants' proposed divestiture included critical caveats. The MMU suggested both structural and conduct based remedies as potential mitigation measures. Most important, the MMU cannot conclude that the Applicants' proposed divestiture will address the market power issues resulting from the merger without the disclosure of relevant additional detail. It is not possible to evaluate a proposed divestiture of installed capacity without an exact specification of the units. It is not possible to make a meaningful assessment of the effectiveness of a proposed divestiture in remedying structural market problems resulting from the proposed merger in the absence of the identification of specific units. A supplemental analysis must be performed once a definitive declaration of divested assets has been developed. The results of divestiture are subject to uncertainty deriving from the characteristics of the individual units (distribution factors) and the characteristics of the

purchasing entities. Ideally, the required characteristics of the units could be specified by the appropriate regulatory authorities in advance of the merger approval and the acceptable characteristics of the acquiring parties could also be specified by the appropriate regulatory authorities in advance of the merger approval.

As the MMU report states, identification of specific units to be divested is required for a meaningful evaluation of the effectiveness of the Applicants' proposed divestiture. As is discussed below, unit specific detail is necessary for the determination of local market composition and structural analysis. It is not possible to perform a meaningful analysis of locational market structure in the absence of the identification of units which the Applicants propose to divest.

### ***Time Period of Analysis***

The MMU analysis covered multiple products in specified geographic markets. In addition to the historical analysis of actual Energy Market results, an analysis of the post-Dominion aggregate supply curve was included. The use of an aggregate Energy Market supply curve permitted an analysis of expected market shares for Exelon and PSEG and for the combined company over a full range of potential seasonal and demand conditions in the aggregate Energy Market. The analysis of the regulation and spinning markets encompassed 12 months of actual market results as these more regional markets were not affected by the integrations that occurred during that period. The Capacity Market analysis included actual historical results and an analysis of a total post-Dominion capacity market structure.

The use of actual historical market data has the clear advantage of incorporating the results of participants' actual bidding behavior in real markets. The use of "forecasts" of market conditions are also based on historical market data but a narrow subset of market data that explicitly assumes that all offers are at cost rather than incorporating the bidding behaviors of market participants. The use of a production cost model to simulate market conditions would be more appropriate to an analysis where actual market data was unavailable.

The MMU report included an aggregate energy market supply curve analysis with all capacity available to participate in the energy market regardless of whether it was presently running. The PJM aggregate Energy Market supply curve was developed utilizing all generator market based offers including imports and including those in the expanded Dominion zone for May 1, 2005.<sup>1</sup> Thus, this analysis includes the impact of all the market integrations on the PJM aggregate Energy Market supply curve, although the analysis covers only the relatively short post-Dominion experience. Market shares were calculated for Exelon and PSEG separately and for the combined company for each 25,000 MW block of energy in the supply curve. In order to determine the relevance of the concentration levels, a frequency distribution of PJM total demand was developed based on historical data for all areas included in the current PJM footprint. The MMU then determined the percentage of annual hours that historical demand fell in each 25,000 MW block.

In addition, the MMU analysis included more capability in the analysis of each market than is dictated by a strict reading of the Commission's delivered price test. As noted below, the delivered price test does not include all capability in a market, regardless of price, but only the capability that clears in a market plus the capability that could clear at a price equal to 105 percent of the clearing price.

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<sup>1</sup> While time did not permit the analysis of the supply curve for every day, the PJM aggregate supply curves are relatively stable.

## ***Need for Unit Specific Detail***

It is necessary to know which specific units are to be divested in order to evaluate the effectiveness of any mitigation proposal in the context of the proposed merger. This is the case regardless of whether the analysis is per the MMU approach or per any other interpretation of the Commission's Appendix A analysis. In the Commission's delivered price test, only capacity that could be delivered into the market at or below 105 percent of the market price is considered. It is therefore not possible to determine the relative competitive position of a block of capacity the Applicants propose to divest without knowing which specific units are involved. The reason to identify the units the Applicants intend to divest is to determine their competitive position within the aggregate market supply curve. The MMU analysis goes a step further than the Appendix A methodology. By using actual market data for the periods studied, the MMU is able to develop supply curves reflecting the actual bidding behavior, availability and performance of all resources. A participant's actual bidding behavior is relevant to a determination of the competitive position of the resource within the aggregate supply curve. By way of example, consider two units with identical cost structures each of which fall within 105 percent of the marginal cost. If actual bidding behavior of one of these resource's owners consistently places this unit above the clearing price, actual dispatch data would reveal that this unit operates at a correspondingly lower capacity factor. The two units therefore affect market prices in distinctly different ways. The MMU's use of actual market data captures this effect and accurately depicts how individual units affect market outcomes.

## ***Local Market Analysis***

There appears to be some misunderstanding about the methods used by the MMU in its analysis of energy submarkets within PJM. The MMU analysis does explicitly include the generation that was actually being sold into the market through its use of actual market and dispatch data. The analysis focuses on the incremental supply available to resolve the constraint. This is the definition of the relevant market at that point. The currently operating units have no impact on the ability of the incremental units to exercise market power at that point. The ability of the incremental units to exercise market power is a function of the characteristics of the incremental supply curve. The use of actual dispatch data forms the basis for the determination of relevant incremental supply available to relieve the constraint. The analysis was performed utilizing a real-time snapshot of actual generation conditions including output, real-time bids and bid limits for October 30, 2004, for the hour beginning 1600 EPT. This period is representative of conditions that exist on a repeated basis and is thus representative of a significant time period as defined in the Commission's delivered price test. The analysis was done so as to be fully consistent with the way that PJM actually dispatches units to solve a constraint. As a result, detailed unit characteristics were explicitly accounted for, including: distribution factors; operational status; fuel type; start and notification time; minimum run time; steam units' ramp rates; and unit economic maximum and economic minimum limits.

The objective of the MMU analysis was to evaluate the structural conditions associated with incremental supply available to relieve the constraint. The objective was to simulate conditions during which the constraint was in effect and the system price was high enough that units whose output could be lowered to relieve the constraint would not be competitive. The analysis considers all units whose increased output relieves the constraint, regardless of their effective cost.

This approach is consistent with the FERC approach that looks at a variety of demand conditions. FERC considers a supplier to have market power if the FERC screens are failed

for any one of the identified demand conditions. The analysis in the report is not intended to and does not represent all demand conditions but it does represent demand conditions which are likely to occur for a significant number of hours. The analysis also represents the conditions under which the merging companies are likely to have high market shares.

The MMU analysis did not focus only on high priced peaking capacity. The MMU analysis included any incremental capacity available to relieve the constraint, consistent with the way that PJM actually dispatches units to solve a constraint. To the extent that CTs were represented on the incremental supply curve, this is a consequence of the nature of the actual supply conditions, not the study design. As a factual matter, under the conditions identified, CTs were the primary units available to PJM operators to resolve the constraints and would be the primary units available under similar conditions.

### ***Need for Unit Specific Distribution Factors***

As the MMU report points out, distribution factors are relevant in determining the adequacy of any divestiture proposal to resolve the market power issues created by the merger. In an aggregate market structure analysis of the type explicitly contemplated under Appendix A, distribution factors would be irrelevant. All qualifying resources capable of delivering output to the market at or below 105 percent of the marginal cost would be regarded on an equivalent basis. In the locational energy market context, the identification of specific units is critical. The locational energy market analysis examines the ability of resources to competitively deliver relief to specific constraints. The key difference between a study of aggregate market structure and local market structure is that all units do not have an equivalent ability to participate in a local market. This ability to participate is driven by the unit's offer price in combination with the unit's electrical proximity to the constrained facility. As an example, consider two units with the same 100 MW capacity and identical energy offers of \$150 at a time when the PJM LMP is \$100. Unit A is located electrically close to the constrained facility and has a distribution factor of 90 percent, while unit B is electrically distant with a 5 percent distribution factor. Unit A is able to provide  $(100 \text{ MW} * 0.90) = 90$  MW of relief to the constraint, while unit B can provide  $(100 \text{ MW} * 0.05) = 5$  MW of relief. The effective cost of the relief from Unit A is  $(\$100 - \$150)/(-0.90) = \$50.56$  per MW, while the effective cost of the relief from Unit B is  $(\$100 - \$150)/(-0.05) = \$1000$  per MW. As may be seen from this simple example, determination of the relative competitive position of units in a local energy market is inseparably tied to unit specific distribution factors and offer price. It is not possible to evaluate the structure of a local energy market without determining its composition which is dependant upon a multitude of factors including unit specific distribution factors and offer parameters. These critical parameters may not be determined without specific identification of the units involved.

### ***Capacity Market***

The MMU concluded that appropriate mitigation could be designed in the capacity market if properly structured and the details adequately specified. The MMU stated the following in the MMU report with respect to capacity market mitigation:

The merging companies' proposal to offer capacity at a zero price represents a form of behavioral mitigation that would resolve the issue if properly structured. The companies' proposal must be structured so that it would provide the required mitigation for a variety of Capacity Market designs, given the current uncertainty about the ultimate design. If the Capacity Market were restructured so that all participants were required to offer all capacity into the market, the companies' proposal would have to cover all capacity offered to the market.

The Applicants in fact propose to offer only their “net” capacity at zero cost and only until such time that PJM implements locational capacity markets for various submarkets within PJM. The Applicants then intend to propose their own mitigation plan but only following approval of their merger application. It is thus impossible to evaluate whether the mitigation plan, as proposed, would resolve the market power issues created by the merger.

The MMU analyzed the mitigation values submitted by the merging companies for the capacity market. For the Total PJM – Post Dominion capacity market, the post-merger HHI value was within 100 points of the pre-merger value. For PJM East with imports, the post-merger HHI values increased by 162 points after the merging companies’ proposed mitigation, meaning that these mitigation levels did not pass the threshold in the DOJ Guidelines. These are the two market definitions for total capacity that are relevant to a determination of competitive market structure. For the PJM East incremental capacity market, the post-merger HHI values are consistent with the DOJ Guidelines. These results point to the need to carefully examine any subsequent mitigation proposal by the Applicants in the context of the prevailing market structure. In the capacity market, as in the other markets analyzed, the identity of the purchaser(s) significantly affects the results of the proposed divestiture.

### ***Regulation Market***

The MMU analysis was not intended to support or refute the conclusions or methodology employed in the Applicants’ filing or supporting documentation. The MMU did not conclude that the availability or unavailability of excess supply was relevant as a mitigating factor for the fact that the proposed merger results in an increase in HHI that exceeds the increase specified in the DOJ Merger Guidelines. Nonetheless, the results of the pivotal supplier analysis (Report Table 5-6) do not lead the MMU to conclude that excess supply is a mitigating factor. The proposed merger would significantly increase concentration in the regulation market as defined by the Guideline metrics and the standards of the Guidelines and therefore raises concerns about potential adverse competitive effects, absent mitigation. The MMU clearly states that the results of its analysis should be interpreted based on those standards and Guidelines.

As regulation capabilities are unit specific, it is necessary that the specific units to be divested are identified in order to determine the effectiveness of the Applicants’ proposed divestiture. The MMU report included the divestiture required to return the post-merger HHI and pivotal supplier results to pre-merger levels. The MMU report also included the divestiture required to return the post merger HHI to within 100 points of the pre-merger levels.

### ***Conclusion***

The MMU report concluded that while the merger creates market power issues under the identified standards, appropriate mitigation measures could resolve the market power issues. The MMU recommends that the appropriate regulatory authorities consider how to define and impose appropriate conditions on those mitigation measures. The MMU’s fundamental point remains that the details of the mitigation measures matter and that the details should be specified carefully in order to ensure that the merger does not have an adverse impact on competition in PJM markets.