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# State of the Market Report for PJM

Monitoring Analytics, LLC

Independent  
Market Monitor  
for PJM

5.14.2010

2010





## PREFACE

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The PJM Market Monitoring Plan provides:

The Market Monitoring Unit shall prepare and submit contemporaneously to the Commission, the State Commissions, the PJM Board, PJM Management and to the PJM Members Committee, annual state-of-the-market reports on the state of competition within, and the efficiency of, the PJM Markets, and quarterly reports that update selected portions of the annual report and which may focus on certain topics of particular interest to the Market Monitoring Unit. The quarterly reports shall not be as extensive as the annual reports. In its annual, quarterly and other reports, the Market Monitoring Unit may make recommendations regarding any matter within its purview. The annual reports shall, and the quarterly reports may, address, among other things, the extent to which prices in the PJM Markets reflect competitive outcomes, the structural competitiveness of the PJM Markets, the effectiveness of bid mitigation rules, and the effectiveness of the PJM Markets in signaling infrastructure investment. These annual reports shall, and the quarterly reports may include recommendations as to whether changes to the Market Monitoring Unit or the Plan are required.<sup>1</sup>

Accordingly, Monitoring Analytics, LLC, which serves as the Market Monitoring Unit (MMU) for PJM Interconnection, L.L.C. (PJM),<sup>2</sup> and is also known as the Independent Market Monitor for PJM (IMM), submits this *2010 Quarterly State of the Market Report for PJM: January through March*.

<sup>1</sup> PJM Open Access Transmission Tariff (OATT), "Attachment M: PJM Market Monitoring Plan," § IV.A, Sixth Revised Sheet No. 452-452A. Capitalized terms used herein and not otherwise defined have the meaning provided in the OATT, PJM Operating Agreement, PJM Reliability Assurance Agreement or other tariff that PJM has on file with the Federal Energy Regulatory Commission (FERC or Commission).

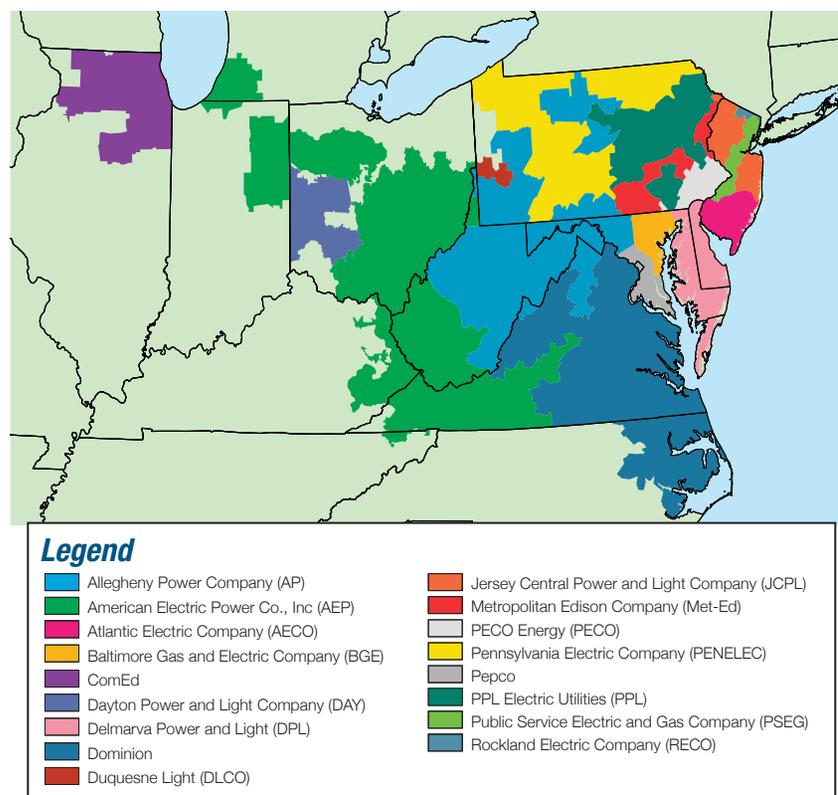
<sup>2</sup> OATT Attachment M § II(f).



## SECTION 1 - INTRODUCTION

The PJM Interconnection, L.L.C. operates a centrally dispatched, competitive wholesale electric power market that, as of March 31, 2010, had installed generating capacity of 167,795 megawatts (MW) and more than 500 market buyers, sellers and traders of electricity in a region including more than 51 million people in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. (See Figure 1-1.)<sup>1</sup> As part of that function, PJM coordinates and directs the operation of the transmission grid and plans transmission expansion improvements to maintain grid reliability in this region.

**Figure 1-1 PJM's footprint and its 17 control zones (See 2009 SOM, Figure A-1)**



<sup>1</sup> See the 2009 *State of the Market Report for PJM*, Volume II, Appendix A, "PJM Geography" for maps showing the PJM footprint and its evolution.

### PJM Market Background

PJM operates the Day-Ahead Energy Market, the Real-Time Energy Market, the Reliability Pricing Model (RPM) Capacity Market, the Regulation Market, the Synchronized Reserve Markets, the Day Ahead Scheduling Reserve (DASR) Market and the Long Term, Annual and Monthly Balance of Planning Period Auction Markets in Financial Transmission Rights (FTRs).

PJM introduced energy pricing with cost-based offers and market-clearing nodal prices on April 1, 1998, and market-clearing nodal prices with market-based offers on April 1, 1999. PJM introduced the Daily Capacity Market on January 1, 1999, and the Monthly and Multimonthly Capacity Markets in mid-1999. PJM implemented an auction-based FTR Market on May 1, 1999. PJM implemented the Day-Ahead Energy Market and the Regulation Market on June 1, 2000. PJM modified the regulation market design and added a market in spinning reserve on December 1, 2002. PJM introduced an Auction Revenue Rights (ARR) allocation process and an associated Annual FTR Auction effective June 1, 2003. PJM introduced the RPM Capacity Market effective June 1, 2007. PJM implemented the DASR Market on June 1, 2008.<sup>2, 3</sup>

### Conclusions

This report assesses the competitiveness of the markets managed by PJM in the first three months of 2010, including market structure, participant behavior and market performance. This report was prepared by and represents the analysis of the independent Market Monitoring Unit (MMU) for PJM.

The MMU concludes that in the first three months of 2010:

- The Energy Market results were competitive;
- The Capacity Market results were competitive;

<sup>2</sup> See also the 2009 *State of the Market Report for PJM*, Volume II, Appendix B, "PJM Market Milestones."

<sup>3</sup> Analysis of 2010 market results requires comparison to prior years. During calendar years 2004 and 2005, PJM conducted the phased integration of five control zones: ComEd, American Electric Power (AEP), The Dayton Power & Light Company (DAY), Duquesne Light Company (DLCO) and Dominion. By convention, control zones bear the name of a large utility service provider working within their boundaries. The nomenclature applies to the geographic area, not to any single company. For additional information on the integrations, their timing and their impact on the footprint of the PJM service territory, see the 2009 *State of the Market Report for PJM*, Volume II, Appendix A, "PJM Geography."

- The Regulation Market results were not competitive;<sup>4</sup>
- The Synchronized Reserve Market results were competitive;
- The Day Ahead Scheduling Reserve Market results were competitive; and
- The FTR Auction Market results were competitive.

### Role of MMU in Market Design Recommendations

The PJM Market Monitoring Plan provides under the heading “Market Design,” in the section setting forth the MMU’s function and responsibilities:

PJM is responsible for proposing for approval by the Commission, consistent with tariff procedures and applicable law, changes to the design of the PJM Markets. If the Market Monitoring Unit detects a design flaw or other problem with the PJM Markets, the Market Monitoring Unit may initiate and propose, through the appropriate stakeholder processes, changes to the design of such market. In support of this function, the Market Monitoring Unit may engage in discussions with stakeholders, State Commissions, PJM Management, or the PJM Board; participate in PJM stakeholder meetings or working groups regarding market design matters; publish proposals, reports or studies on such market design issues; and make filings with the Commission on market design issues.<sup>5</sup>

In addition, the PJM Market Monitoring Plan provides, in describing MMU Reports: “In its annual, quarterly and other reports, the Market Monitoring Unit may make recommendations regarding any matter within its purview.”<sup>6</sup>

### Recommendations

The MMU recommends retention of key market rules, specific enhancements to those rules and implementation of new rules that are required for competitive results in PJM markets and for continued improvements in the functioning of PJM markets. In this *2010 Quarterly State of the Market Report for PJM: January through March*, the recommendations from the *2009 State of the Market Report for PJM* are still valid, and the MMU has no new recommendations for the first three months of 2010.

### Total Price of Wholesale Power

The total price of wholesale power is the total price per MWh of purchasing wholesale electricity from PJM markets. The total price is an average price and actual prices vary by location. The total price includes the price of energy, capacity, ancillary services, transmission service, administrative fees, regulatory support fees and uplift charges billed through PJM systems. Table 1-1 provides the components of the total average price for wholesale power in PJM. Each of these items is defined in PJM’s Open Access Transmission Tariff (OATT) and PJM Operating Agreement and each is collected through PJM’s billing system.

### Components of Total Price

- The Load Weighted Energy component is the load weighted average PJM locational marginal price (LMP).
- The Capacity component is the average price per MWh of Reliability Pricing Model (RPM) payments in the first three months of 2010.
- The Transmission Service Charge component is the average price per MWh of network integration charges and firm and non firm point to point transmission service.<sup>7</sup>
- The Operating Reserve (Uplift) component is the average price per MWh of day ahead and real time operating reserve charges.<sup>8</sup>
- The Reactive component is the average cost per MWh of reactive supply and voltage control from generation and other sources.<sup>9</sup>

<sup>4</sup> The regulation market results are not the result of the offer behavior of market participants, which is competitive as a result of the application of the three pivotal supplier test. The regulation market results are not competitive because the changes in market rules, in particular the changes to the calculation of the opportunity cost, resulted in a price greater than the competitive price. The competitive price is the actual marginal cost of the marginal resource in the market. The competitive price in the Regulation Market is the price that would have resulted from the application of the prior, correct approach to the calculation of the opportunity cost. The correct way to calculate opportunity cost and maintain incentives across both regulation and energy markets is to treat the offer on which the unit is dispatched for energy as the measure of its marginal costs for the energy market. To do otherwise is to impute a lower marginal cost to the unit than its owner does and therefore impute a higher opportunity cost than its owner does.

<sup>5</sup> PJM OATT Attachment M § IV.D. On March 18, 2010, PJM filed in Docket No. ER09-1063-000 revisions to Attachment M that, among other things, describe the full scope of this core function, consistent with the Commission’s order of December 18, 2009 on PJM’s initial filing in compliance with Order No. 719. 125 FERC ¶61,250 at P 113.

<sup>6</sup> PJM OATT Attachment M § VI.A.

<sup>7</sup> PJM OATT Section 13.7, Section 14.5 & 27A and Section 34.

<sup>8</sup> PJM Operating Agreement Schedules 1-3.2.3 & 1-3.3.3.

<sup>9</sup> PJM OATT Schedule 2 and Operating Agreement Schedule 1-3.2.3B.

- The Regulation component is the average cost per MWh of regulation procured through the Regulation Market.<sup>10</sup>
- The PJM Administrative Fees component is the average cost per MWh of PJM's monthly expenses for a number of administrative services, including Advanced Control Center (AC2) and OATT Schedule 9 funding of FERC, OPSI and the MMU.
- The Transmission Enhancement Cost Recovery component is the average cost per MWh of PJM billed (and not otherwise collected through utility rates) costs for transmission upgrades and projects, including annual recovery for the TrAILCo and PATH projects.<sup>11</sup>
- The Transmission Owner (Schedule 1A) component is the average cost per MWh of transmission owner scheduling, system control and dispatch services charged to transmission customers.<sup>12</sup>
- The Synchronized Reserve component is the average cost per MWh of synchronized reserve procured through the Synchronized Reserve Market.<sup>13</sup>
- The Black Start component is the average cost per MWh of black start service.<sup>14</sup>
- The RTO Startup and Expansion component is the average cost per MWh of charges to recover AEP, ComEd and DAY's integration expenses.<sup>15</sup>
- The NERC/RFC component is the average cost per MWh of NERC and RFC charges, plus any reconciliation charges.<sup>16</sup>
- The Load Response component is the average cost per MWh of day ahead and real time load response program charges to LSEs.<sup>17</sup>
- The Transmission Facility Charges component is the average cost per MWh of Ramapo Phase Angle Regulators charges allocated to PJM Mid-Atlantic transmission owners.<sup>18</sup>

**Table 1-1 Total price per MWh: January through March 2010 (See 2009 SOM, Table 1-1)**

| Category                               | \$/MWh         | Percent       |
|--|----------------|---------------|
| Load Weighted Energy                   | \$45.92        | 73.1%         |
| Capacity                               | \$11.00        | 17.5%         |
| Transmission Service Charges           | \$3.87         | 6.2%          |
| Operating Reserves (Uplift)            | \$0.63         | 1.0%          |
| PJM Administrative Fees                | \$0.38         | 0.6%          |
| Reactive                               | \$0.35         | 0.6%          |
| Regulation                             | \$0.34         | 0.5%          |
| Transmission Enhancement Cost Recovery | \$0.12         | 0.2%          |
| Transmission Owner (Schedule 1A)       | \$0.08         | 0.1%          |
| Synchronized Reserves                  | \$0.05         | 0.1%          |
| NERC/RFC                               | \$0.02         | 0.0%          |
| Black Start Services                   | \$0.02         | 0.0%          |
| RTO Startup and Expansion              | \$0.01         | 0.0%          |
| Load Response                          | \$0.01         | 0.0%          |
| Transmission Facility Charges          | \$0.00         | 0.0%          |
| <b>Total</b>                           | <b>\$62.80</b> | <b>100.0%</b> |

<sup>10</sup> PJM Operating Agreement Schedules 1-3.2.2, 1-3.2.2A, 1-3.3.2, 1-3.3.2A and OATT Schedule 3.

<sup>11</sup> PJM OATT Schedule 12.

<sup>12</sup> PJM OATT Schedule 1A.

<sup>13</sup> PJM Operating Agreement Schedule 1-3.2.3A.01 and OATT Schedule 6.

<sup>14</sup> PJM OATT Schedule 6A.

<sup>15</sup> PJM OATT Attachments H-13 and H-14 and Schedule 13.

<sup>16</sup> PJM OATT Schedule 10-NERC and OATT Schedule 10-RFC.

<sup>17</sup> PJM Operating Agreement Schedule 1-3.6.

<sup>18</sup> PJM Operating Agreement Schedule 1-5.3b.

