



# **Potomac River Plant Outage Market Analysis**

PJM Market Monitoring Unit  
December 6, 2005

The PJM Market Monitoring Unit (MMU) received a letter dated September 23, 2005, from the Public Service Commission of the District of Columbia (PSC) requesting answers to certain questions about the impact of the recent outages at the Potomac River plant, owned by Mirant. Each of the questions from the PSC is addressed below.

On August 24, 2005, Mirant, citing environmental restrictions, notified PJM that the five coal-fired generating units at their Potomac River generating facility would be shut down. The notifications to PJM characterized the outages as unplanned for environmental causes. These outages continue with the exception of Potomac River unit number one which returned to service on September 22, 2005.

The PJM Market Monitoring Unit (MMU) evaluated the period from August 26, 2005 through September 28, 2005.<sup>1</sup> The MMU compared the actual Day-Ahead Market results to a sensitivity case in which the Potomac River units were returned from outage and offered into the PJM Market using Mirant's price-based offers. For the sensitivity case, the Day-Ahead Market was re-run using a full security constrained economic dispatch to determine the impact of the Potomac River units' outage on market outcomes.

The MMU analysis focused on market impacts. The reliability impacts of the plant shutdown have been addressed by PJM in filings in FERC Docket No. EL05-145 and DOE Docket No. EO-05-01.

In each case reported below:

- The base case represents the situation with the actual outages taken by the Potomac River units.
- The sensitivity case represents the situation in which the Potomac River units were fully available to the PJM Markets and all other market conditions are the same.

### **What adverse impacts, if any, has the shutdown of the Potomac River plant had on competition or the operation of the PJM Market?**

The structure of the overall PJM Energy Market is generally competitive.<sup>2</sup> The Potomac River outage did not have a significant impact on the structure of the overall PJM Energy Market. In addition, the Potomac River outage did not have a significant impact on PJM prices as shown in Table 1.

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<sup>1</sup> The MMU did not include August 25, 2005 from its analysis. Although Mirant notified PJM that the Potomac River Plant was to be shutdown on August 24<sup>th</sup>, the notification was received after the time at which offers were required for the Day-Ahead Energy Market for August 25<sup>th</sup> which was run on August 24<sup>th</sup>. The Potomac River Plant was consequently selected to run in the Day-Ahead Market for August 25<sup>th</sup>. The evaluation period began on August 26<sup>th</sup> as the first day in which the Potomac River Plant outage prevented the facility's participation in the Day-Ahead Market.

<sup>2</sup> Market structure is generally measured by concentration ratios like HHI, by market shares and by pivotal supplier indicators like RSI.

The Potomac River plant is also part of the local market to provide relief for the Bedington-Black Oak constraint. The Potomac River outage did not have a significant impact on the competitiveness of this local market. Units are offer-capped when they operate for that constraint as the local market is not competitive. Mirant's other units in the PEPCO zone, had they been requested to provide relief for this constraint, would have been subject to the offer capping provisions of the PJM tariff.

Table 1 compares the zonal daily average LMP values in the base case to those in the sensitivity case. The largest price impact was in the PEPCO zone where there was a \$0.63 per MWh increase in daily average LMP. The next largest price impacts were in the Dominion (DOM) zone, \$0.58 per MWh, the BGE zone, \$0.56 per MWh, and the APS zone, \$0.18 per MWh, all increases in daily average LMP.<sup>3</sup>

**Table 1 Zonal LMP Differences<sup>4</sup>**

Zone	Base Case	Sensitivity Case	Difference	% Difference	Min Difference	Max Difference
AECO	\$ 90.28	\$ 90.28	\$ 0.00	0.00%	\$ (2.17)	\$ 0.68
AEP	\$ 57.87	\$ 57.79	\$ 0.07	0.13%	\$ (0.24)	\$ 0.31
APS	\$ 73.94	\$ 73.75	\$ 0.18	0.25%	\$ (0.45)	\$ 0.78
BGE	\$ 89.16	\$ 88.61	\$ 0.56	0.63%	\$ (0.25)	\$ 1.51
COMED	\$ 57.40	\$ 57.34	\$ 0.05	0.09%	\$ (0.30)	\$ 0.32
DAY	\$ 56.06	\$ 56.03	\$ 0.04	0.07%	\$ (0.32)	\$ 0.34
DOM	\$ 86.68	\$ 86.10	\$ 0.58	0.67%	\$ (0.34)	\$ 1.80
DPL	\$ 87.96	\$ 87.94	\$ 0.02	0.02%	\$ (2.39)	\$ 0.73
DUQ	\$ 49.94	\$ 49.92	\$ 0.01	0.03%	\$ (0.35)	\$ 0.51
JCPL	\$ 82.69	\$ 82.74	\$ (0.05)	-0.06%	\$ (2.25)	\$ 0.65
METED	\$ 84.84	\$ 84.70	\$ 0.14	0.16%	\$ (0.96)	\$ 0.68
PECO	\$ 86.30	\$ 86.29	\$ 0.01	0.01%	\$ (2.54)	\$ 0.97
PENELEC	\$ 73.37	\$ 73.48	\$ (0.11)	-0.15%	\$ (4.07)	\$ 0.37
PEPCO	\$ 92.30	\$ 91.66	\$ 0.63	0.69%	\$ (0.28)	\$ 1.59
PPL	\$ 83.86	\$ 83.80	\$ 0.06	0.07%	\$ (1.34)	\$ 0.60
PSEG	\$ 91.41	\$ 91.42	\$ (0.00)	0.00%	\$ (1.59)	\$ 1.22
RECO	\$ 87.20	\$ 87.23	\$ (0.03)	-0.03%	\$ (2.19)	\$ 0.58

### **To what extent has the deactivation of the Potomac River plant been responsible for the recent increase in locational marginal prices (LMP) in the PEPCO Zone?**

The PEPCO Zone daily average LMP was determined for the sensitivity case with the Potomac River units in service compared to the base case where the units were on outage.

<sup>3</sup> A number in parentheses indicates a negative number. A negative number in this context means that the price was lower in the base case, with the outages, than in the sensitivity case, without the outages. Note also that the results reflect rounding.

<sup>4</sup> Note that all results are reported as the base case (actual outages) less the sensitivity case (units offered without outages) and that the percentages are calculated using the base case as the denominator.

The results of the analysis show that the PEPCO Zone daily average LMP was \$0.63 per MWh (0.69 percent) higher as a result of the Potomac River units being on outage.

**With respect to all power transactions within the PJM Market since August 24, what has been the affect on revenues to all generators attributable to the shutdown of Potomac River?**

For the period analyzed, total PJM generation revenue was 0.13 percent higher (about \$5 million on a base of \$4 billion) in the base case, with the outages, than in the sensitivity case in which the Potomac River Units were offered to the market. Table 2 shows the total PJM generation revenue for the base and sensitivity cases.

**Table 2 Total PJM Generation Revenue**

	Base Case	Sensitivity Case	Difference	Percent Difference
Revenue	\$ 4,045,323,636	\$ 4,040,231,165	\$ 5,092,471	0.13%

**Since the August 24 shutdown, how do the revenues and profit margins earned by Mirant at all of its plants in the PEPCO Zone (including Chalk Point, Morgantown and Dickerson) compare to what Mirant would have earned had Potomac River operated normally during this period?**

Total revenues at the Chalk Point, Dickerson and Morgantown stations were higher by from 0.2 percent to 1.0 percent as a result of the Potomac River outages than would had been the case if the Potomac River units had been offered into the market.

Revenues reflect price times quantity and do not measure profitability. A unit could show a large increase in revenues and no increase in profitability. The margin, or net revenue, is a measure of profitability. Margins were higher at these units in the sensitivity case by from 1.1 to 1.3 percent.<sup>5</sup>

Including the lost revenue from the Potomac River units, total Mirant generation revenue was about 4 percent lower in the base case than in the sensitivity case.

**Has the shutdown affected spot market prices for power generated at Mirant's other plants within the PEPCO Zone, and, if so, how?**

The daily average day-ahead LMP at Mirant's other plants within the PEPCO zone was on average \$0.65 per MWh higher in the base case than in the sensitivity case with a minimum increase of \$0.59 per MWh and a maximum of \$0.70 per MWh.

<sup>5</sup> Margin calculation uses owner submitted cost data.