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2023 Quarterly State of the Market Report for PJM: January through September

MARKET MONITOR FINDS PJM WHOLESALE ELECTRICITY MARKETS COMPETITIVE

(Eagleville, PA, November 9, 2023) PJM Interconnection's wholesale electric energy market produced competitive results during the first nine months of 2023, according to the *2023 Quarterly State of the Market Report for PJM: January through September* released today by Monitoring Analytics, LLC, the Independent Market Monitor for PJM.

The Independent Market Monitor, Joseph Bowring, announced findings of the report today. The report is the Independent Market Monitor's assessment of the competitiveness of the wholesale electricity markets managed by PJM in 13 states and the District of Columbia. The report includes analysis of market structure, participant behavior and market performance for each of the PJM markets.

"Our analysis concludes that the results of the PJM Energy Market were competitive in the first nine months of 2023," Bowring said.

Energy prices decreased in the first nine months of 2023 from the first nine months of 2022. The real-time load-weighted average LMP in the first nine months of 2023 decreased \$46.97 per MWh, 60.3 percent, from the first nine months of 2022, from \$77.84 per MWh to \$30.87 per MWh. This is the largest dollar and percent decrease in PJM real-time load-weighted average LMP for the first three quarters of the year since PJM competitive markets were introduced in 1999. Of the \$46.97 per MWh decrease in the real-time load weighted average LMP, \$30.57 per MWh (65.1 percent) was a result of the decreased cost of fuel and consumables cost components of LMP. Natural gas prices, coal prices, and oil prices decreased in the first nine months of 2023 compared to the first nine months of 2022. The real-time hourly average load in the first nine months of 2023 decreased by 3.9 percent from the first nine months of 2022, from 90,514 MWh to 87,003 MWh.

The total price of wholesale power decreased from \$103.41 per MWh in the first nine months of 2022 to \$53.26 per MWh in the first nine months of 2023, a decrease of 48.5 percent. Energy (58.0 percent), capacity (8.0 percent) and transmission charges (30.7 percent) are the three largest components of the total price of wholesale power, comprising 96.7 percent of the total price per MWh in the first nine months of 2023. Starting in the third quarter of 2019, the cost of transmission per MWh of wholesale power has been higher than the cost of capacity.

Energy prices in PJM in the first nine months of 2023 were set, on average, by units operating at, or close to, their short run marginal costs, although this was not always the case. This is

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evidence of generally competitive behavior and competitive market outcomes, although high markups for some marginal units did affect prices.

In the first nine months of 2023, generation from coal units decreased 30.3 percent, generation from natural gas units increased 9.3 percent, and generation from oil increased 23.4 percent compared to the first nine months of 2022. Wind and solar output decreased by 1.1 percent compared to the first nine months of 2022, supplying 4.7 percent of PJM energy in the first nine months of 2023.

Net revenue is a key measure of overall market performance as well as a measure of the incentive to invest in generation to serve PJM markets. Energy market net revenues are significantly affected by energy prices and fuel prices. Energy prices and fuel prices were significantly lower in the first nine months of 2023 than in the first nine months of 2022. Theoretical net revenues from the energy market decreased for all unit types in the first nine months of 2023 compared to the first nine months of 2022. Theoretical energy market net revenues decreased by 42 percent for a new combustion turbine (CT), 50 percent for a new combined cycle (CC), 77 percent for a new coal plant (CP), 59 percent for a new nuclear plant, 58 percent for a new onshore wind plant, 62 percent for a new offshore wind plant and 66 percent for a new solar plant.

Total energy uplift charges decreased by \$59.2 million, or 33.1 percent, in the first nine months of 2023 compared to the first nine months of 2022, from \$178.8 million to \$119.6 million.

When there are binding transmission constraints and locational energy price differences, customers pay more for energy than generation is paid to produce that energy. The difference is congestion. Congestion revenues belongs to customers and should be returned to customers. Total congestion costs decreased by \$1,102.8 million or 59.2 percent, from \$1,863.2 million in the first nine months of 2022 to \$760.4 million in the first nine months of 2023. But only 82.2 percent of total congestion paid by customers for the 2023/2024 planning period was returned to customers through the ARR and self-scheduled FTR revenues offset. The goal of the FTR market design should be to ensure that customers have the rights to 100 percent of the congestion revenues that customers pay. Load has received \$3.9 billion less in congestion revenues than load should have received from the 2011/2012 planning period through the first four months of the 2023/2024 planning period.

The Independent Market Monitor (also known as the Market Monitoring Unit or MMU or IMM) evaluates the operation of PJM's wholesale markets to identify ineffective market rules and tariff provisions, proposes improvements to market rules and tariff provisions when needed, monitors compliance with and implementation of the market rules, identifies potential anticompetitive behavior by market participants and provides comprehensive market analysis critical for informed policy and decision making. Joseph Bowring, the Market Monitor, ensures the independence and objectivity of the monitoring program.

For a copy of the State of the Market Report, visit Monitoring Analytics at: http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2023.shtml