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Options to Address FTR Underfunding

The Independent Market Monitor for PJM

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Overview

PJM's objectives with regard to financial transmission rights (FTR) are to provide full funding of FTRs while simultaneously maximizing the use of the transmission system through allocation of Auction Revenue Rights (ARRs) and FTRs. In PJM's market, where full funding is measured relative to day ahead congestion Target Allocations rather than actual congestion, these are conflicting objectives.

FTRs provide a right to actual congestion revenues on specified paths based on day ahead and balancing congestion. An FTR's maximum allocation of congestion revenues under PJM rules is called a Target Allocation. Target Allocations are calculated only on the basis of day ahead congestion revenues on FTR paths, not the actual total congestion revenues collected based on day ahead and balancing market results. Due to differences between actual system capability realized in real time markets and the system as modeled in the day ahead and FTR allocation markets, the greater the allocation of congestion rights, relative to actual capability, the greater the probability that full funding, measured in terms of day ahead based Target Allocations, will not occur.

While full funding is a PJM objective it is not a requirement. The FTR product is not intended to be a full hedge of congestion, nor is full funding relative to a day ahead based target allocation guaranteed. PJM and the MMU have analyzed FTR underfunding issue with the intent of better understanding the causes of underfunding and thereby provide options to address the underfunding issue.

This report outlines the options developed by the MMU to address the FTR underfunding issue.

Options to Address FTR Underfunding

The FTR Revenue Stakeholder Report, posted separately by PJM, presents possible reasons for FTR revenue inadequacy. The report shows that underfunding has been a recurring issue in recent years. The report demonstrates that there has been an increase in negative balancing congestion near the PJM borders with other systems. Analysis of the issue has indicated that there are a number of options to address the issue of FTR underfunding. However, the removal of balancing congestion from the FTR funding equation is not an appropriate solution to the FTR underfunding problem

The fact that removal of balancing congestion charges would reduce FTR underfunding should not be allowed to confuse the issue. There has been no statistical or causal link established between the level of balancing congestion and the level of FTR underfunding, from 2005 to the present. Balancing congestion charges predate the FTR underfunding issue. Most of the increase in negative balancing congestion is a result of

unexpected and systematic discrepancies between actual market results and the Day Ahead and FTR models of the PJM and neighboring systems.¹ Systematic negative balancing is a signal that the Day Ahead Market is not accurately reflecting the real time system. Contributing to differences between the FTR allocation market, the day ahead market and real time market are outages and system capability reductions that have been excluded from the day ahead and FTR allocation market models.² Capability adjustments, unexpected or unaccounted for, have an impact on balancing congestion and on FTR funding.

The reasons for recent increased shortfalls in FTR funding, identified by PJM, support the continued use of the current definition of FTR revenues, which includes balancing congestion. The reasons provided by PJM result in over selling FTRs, which creates balancing congestion, which reduces the funds available to pay FTR holders. It is appropriate that FTR holders are paid less when FTR revenues, including balancing congestion, are reduced.

Solutions to the underfunding issues need to focus on the causes of underfunding rather than the symptoms. Discrepancies between the operational system and PJM's day ahead and FTR models of the system are the cause of both negative balancing congestion and FTR underfunding. Contributing to the underfunding issue is the overselling of FTRs relative to realized capability due systematic differences between what is assumed in the FTR model and actual conditions. The FTR Stakeholder report shows that a significant portion of the underfunding issue is related to inaccurate modeling of the PJM interface with MISO, some of which may be unavoidable.

In the FTR Stakeholder Report, PJM indicates that they have taken steps to better coordinate information exchanges with neighboring markets and systems to improve the modeling of interconnected systems in the day-ahead and FTR market. More steps can and should be taken to further improve market coordination and modeling.

The MMU options for addressing FTR underfunding include: improvements to day ahead market modeling to minimize differences between actual congestion and day ahead congestion and improvements to the FTR allocation modeling to minimize differences between actual system capability and modeled system capability.

¹ FTR Stakeholder Report pp. 27-40.

² FTR Stakeholder Report p. 26

Modeling Issues in the Day Ahead Market

The FTR Stakeholder Report identifies a number of areas where improvements to the modeling of the Day Ahead market, designed to bring it more in line with real time market results, would reduce negative balancing congestion and reduce underfunding. The more the day ahead market results reflect real time market outcomes, the smaller the balancing component of congestion charges and the greater the share of day ahead congestion as a part of total congestion. Many of the issues PJM cites relate to the modeling of the PJM-MISO border. These include the impact of external wind resources that are not modeled in the day ahead market, unforeseen external transmission and generation outages, and loop flow modeling issues.³ The FTR Stakeholder Report indicates that in 2011, 32.9 percent of all congested hours were from facilities near PJM borders, and that 53.4 percent of negative balancing congestion was from this congestion.⁴

Other sources of modeling issues include: transmission and generation outages, internal to PJM, that are announced after PJM has completed the modeling of the day ahead market;⁵ PJM wind resources that operate in real time but are not modeled in the day ahead market; and facility deratings that are not captured in the day ahead market.⁶

PJM also identifies loop flow as a problem leading to increased negative balancing congestion.⁷ Actual loop flow that differs from modeled loop flow lowers the actual capability of the modeled facility leading to an underfunding of FTRs.

PJM is making efforts to improve their modeling through several new initiatives.⁸ PJM has required transmission owners to provide more detail on their outages, which will allow more accurate models to be developed. PJM has implemented a daily meeting with MISO to coordinate activities and expectations for day-ahead modeling.

PJM is improving its modeling of the border region with MISO and that work should continue. Improving even one of the modeling issues should lower negative balancing

³ FTR Stakeholder Report pp. 27-31

⁴ FTR Stakeholder Report p. 4

⁵ FTR Stakeholder

⁶ FTR Stakeholder Report pp. 35-37

⁷ FTR Stakeholder Report pp. 38-41

⁸ FTR Stakeholder Report p. 4

congestion by providing a more accurate day-ahead model and reducing FTR underfunding by addressing the root cause. In an effort to reduce both FTR underfunding and negative balancing congestion, a detailed study of the congestion patterns at the PJM-MISO border should be undertaken. This is the source of a substantial portion of the underfunding. PJM should continue to develop more coordination with its neighbors related to planning and coordinating outages. PJM should consider stricter guidelines for announcing and modeling internal outages to improve day ahead modeling. Additional efforts should be made to improve the modeling of wind resources in the day ahead market. The MMU recommends that these efforts be continued and expanded consistent with the contribution of each to underfunding.

Modeling Issues in the FTR Allocation Market Model

The FTR Stakeholder Report identifies a number of areas where improvements in the FTR market model would bring FTR market more in line with actual market results, reduce the over allocation of FTRs and reduce underfunding. The more the FTR allocation market model resembles market outcomes, the more accurate the FTR allocation will be. The FTR related modeling issues that contribute to underfunding include: the modeling of the PJM-MISO border; the impact of external wind resources that are not modeled in the day ahead market; unanticipated changes in the number of flowgates; unforeseen external transmission and generation outages; and loop flow modeling issues.⁹ In addition, PJM cites a number of modeling issues related to PJM's own system, including modeling error related to emergency transmission and generation outages that occur during the planning year after PJM has completed the modeling of the FTR market;¹⁰ and facility deratings that are not captured in the FTR model.¹¹

PJM specifically notes that there has been an increase in market to market flowgates, which are added during the planning period and not modeled in the annual auction.¹² There were 188 total flowgates added in the last two years that were not modeled in the annual ARR/FTR process.¹³ A significant portion, 150 of the 188 flowgate additions, were

⁹ FTR Stakeholder Report pp. 27-31

¹⁰ FTR Stakeholder

¹¹ FTR Stakeholder Report pp. 35-37

¹² FTR Stakeholder Report p. 4, p. 30-31

¹³ FTR Stakeholder Report p. 30

added at MISO's request.¹⁴ The inability to model these flowgates in the simultaneous feasibility test contributes to a misallocation of FTRs and FTR underfunding. A more coordinated long term effort to identify future flowgates would allow them to be modeled in the FTR auctions.

PJM also identifies loop flow as a problem leading to increased FTR underfunding. Loop flows beyond that modeled in the FTR allocation market lower the actual capability of the modeled facility, meaning that FTRs are oversold, which directly contributes to underfunding. It is recognized that actual loop flows are not easily predicted, particularly for longer term auctions. While PJM's FTR model does include a loop flow factor, PJM should consider ways to improve it. Absent the ability to accurately model loop flows, PJM should consider making more conservative assumptions about loop flows.

¹⁴ FTR Stakeholder Report p. 30