

# The Benefits of Financial Transmission Rights and the Need for Enhanced Credit and Risk Management Protocols in PJM

## Introduction

The Energy Trading Institute (the Institute) advocates for open, transparent, competitive and fair electricity markets that result in significant savings to consumers. The Institute's members engage in energy-related commercial transactions with a variety of market entities, including generation owners, project developers, load-serving entities, and investors.<sup>1</sup> Our members also serve load, own generation and finance infrastructure in the energy space. Notably, several of our members highlighted the potential for the GreenHat default and the need for meaningful credit policy enhancements in PJM years before the default occurred. The problems associated with the GreenHat default did not result from any deficiency in the structure, performance or competitiveness of the PJM Financial Transmission Right (FTR) market. Rather, they solely relate to PJM's credit policy and counterparty risk management practices regarding FTRs.

This paper provides the Institute's perspective on two key topics currently being discussed in the PJM stakeholder process. First, we address the critical nature of FTRs in a Locational Marginal Price (LMP) market construct, which will only be more essential as we face the future challenges posed by increasing renewable and distributed generation resources, energy storage, demand response, carbon pricing, fuel security and grid resiliency. Second, we discuss recommendations for ways to protect consumers and market participants from a future default in PJM.

## Financial Transmission Rights Are A Critical Component of Competitive Markets

FTRs are inextricably linked to the underlying delivery of power to customers and are integral to shielding consumers from the inevitable price volatility that results from having to perfectly balance the grid every minute of the day. The Commission and Congress have been clear that FTRs are a crucial tool. In a recent order the Commission stated:

---

<sup>1</sup> A complete list of our members can be found at:  
<https://www.energytradinginstitute.org/members.html>.

**ENERGY TRADING INSTITUTE  
POSITION PAPER 2019**

FTRs were designed to serve as the financial equivalent of firm transmission service and play a key role in ensuring open access to firm transmission service by providing a congestion hedging function. The purpose of FTRs to serve as a congestion hedge has been well established. In the Energy Policy Act of 2005, Congress added section 217(b)(4) to the FPA, directing the Commission to exercise its authority to “enable load serving entities to secure firm transmission rights (or equivalent tradable or financial rights) on a long-term basis for long-term power supply arrangements made, or planned, to meet such needs.” In Order No. 681, the Commission clearly emphasized the significance of FTRs in hedging congestion price risk.<sup>2</sup>

The integrity of the FTR product, and open access to FTRs’ availability in a non-discriminatory structure, are critical aspects of the nodal market design on which every well-functioning electricity market is based. Participating in an LMP system exposes market participants to congestion. Prices can be different at each “node” on the grid when there is congestion, but in an LMP system, market participants no longer have physical rights to move power from point to point and avoid congestion. Under LMP, the physical rights must be converted to financial rights.

The FTR auctions play two important roles. First, they represent a sophisticated way for PJM to allocate the excess congestion rents that are inherent in the LMP system by assigning Auction Revenue Rights (ARRs) to Load Serving Entities (LSEs). Second, the FTR auction is a market mechanism for allocating the transmission capability on the grid to market participants who value them most. ARR holders receive rights to transfer capability and may choose to convert these rights to FTRs to help manage financial risk in their portfolios; or they may choose to participate in the FTR market on a contingent basis; or they may purchase a different set of FTRs from their entitlement that better meets their specific risk tolerance and financial needs; or they may choose to forego trading FTRs altogether, instead relying on financial intermediaries or “standard offer service” auctions as the means to manage the financial risk of serving load. But even LSEs that choose to forego participating in FTR markets benefit from a well-functioning FTR market because financial intermediaries with whom they are transacting are themselves in need of a mechanism to efficiently manage their basis risk. Without the liquidity and transparency of FTRs as a market mechanism for managing congestion, retail service providers or standard offer service providers would need to incorporate

---

<sup>2</sup> PJM Interconnection, LLC, Order on Rehearing and Compliance, 158 FERC ¶ 61,093 (2019) (citing 16 U.S.C. § 824q(b)(2)(2012), *Long-term Firm Transmission Rights in Organized Elec. Mkts.*, Order No. 681, FERC Stats. & Regs. ¶ 31,226 at P 169, reh’g denied, Order No. 681-A, 117 FERC ¶ 61,201 (2006), order on reh’g and clarification, Order No. 681-B, 126 FERC ¶ 61,254 (2009), and Order No. 681-A, 117 FERC ¶ 61,201 at P 13).

**ENERGY TRADING INSTITUTE  
POSITION PAPER 2019**

larger risk premia in their offers to serve customer demand, resulting in higher prices for consumers.

It is important to note that any LSE that chooses to convert their ARR to FTRs will achieve essentially the same financial outcome as it would by directly assigning congestion rents to load, as has been proposed by the Market Monitor.

Below are examples of how different market participants utilize FTRs to manage their forward congestion risk.

- *Load Serving Entities:* The FTR market is beneficial to LSEs for hedging forward congestion price risk associated with supplying electricity consumers at specific locations. The FTR auctions provide a market mechanism for valuing congestion that helps retail service providers and buyers of standard offer/default service obligations price more competitively, reducing costs to consumers. The FTR auctions (planning year, long-term, and balance of planning year), the competitively determined transparent locational auction prices, and the tradeable ARR and FTR instruments afford LSEs many opportunities for effective pricing and hedging congestion risk as far as four years forward. LSEs who supply electricity to consumers rely on FTRs to hedge the risk of the price of congestion when serving their customers in particular locations. LSEs make decisions on whether to convert their ARRs to FTRs or whether to participate in the FTR market based on the pricing provided in liquid and transparent FTR auctions. Moreover, the FTR auctions represent contestable markets for the futures market for critical hub to load zone contracts, adding liquidity and transparency, and an important level of discipline that ensures the competitiveness of these futures markets. Absent the FTR auction, the LSE would be left to purchase more expensive hedges, reflecting the higher risk premia associated with serving volatile locations absent necessary hedging instruments. These higher costs translate into higher costs for consumers.

LSEs utilize the FTR market in day-to-day operations. Below are a few specific examples of how:

- a. Receiving ARRs for the upcoming planning year through a nomination process,
- b. Optimizing the value of allocated ARRs via exercising the option to retain the ARRs or convert the ARRs to FTRs for the annual FTR auction (note that an LSE may strategically participate in the annual FTR auction even if the LSE decides to retain its ARRs),
- c. Pricing congestion risk for forward load supply contracts by utilizing the transparent locational long-term FTR auction prices (for example, the New

**ENERGY TRADING INSTITUTE  
POSITION PAPER 2019**

- Jersey BGS auction allows LSEs to compete to supply load three years forward, which lines up with PJM’s three-year long-term FTR auction), and
- d. Transacting with a third party, such as a financial participant with a robust FTR portfolio that is willing to manage forward congestion price risk to lock in a fixed price for the forward congestion risk associated with the LSE’s load supply contracts.

Without an FTR auction and the transparent forward locational prices its competitive process creates, an LSE’s visibility into forward congestion values becomes limited and the options for managing forward congestion price become more expensive. Absent the FTR auction, an LSE who wishes to hedge its forward congestion risk would be left to participate in a bilateral market that is opaquer and less liquid than PJM’s FTR auction market. Congestion hedge transactions would likely become more expensive because the lack of forward locational congestion price transparency would lead to elevated risk premiums. Since the LSE would pay more for forward congestion hedges, its consumers would pay higher prices for electricity.

- *Renewable developers and new entrants:* Increasingly, utilities and large private renewable customers (I.e. Google, Amazon, Microsoft, Walmart, etc.) are no longer willing to enter into power purchase agreements at the project bus bar as had been customary in the first wave of renewable development. Now the project developers increasingly need to take on the congestion risk from the outset of construction, which is an improvement in the alignment of risk and proper incentives for project siting.<sup>3</sup> As such, new entrants looking to build in specific locations need hedges with respect to the congestion costs at their bus bar, but the risk premia on any specific, potentially congested, location can be quite high under the LMP system. Transparency of pricing and trading liquidity at the specific location of entry is essential to the entrant receiving the most competitive financing and structuring terms possible.

Forward FTR auctions are crucial in providing this transparency and liquidity. When FTR markets are available, sophisticated financial intermediaries can more competitively offer congestion hedges or financing terms, and market intelligence to the developer (for example, perhaps they are considering alternative locations, but one is in a particularly poorly connected low voltage area). Competition among market participants who may only be willing to transact at reasonable

---

<sup>3</sup> This is not only appropriate, but also represents an important “dynamic efficiency benefit” of having a competitive market structure that may not be noticed by many observers.

**ENERGY TRADING INSTITUTE  
POSITION PAPER 2019**

prices with access to FTR trading liquidity<sup>4</sup> will result in the best possible terms for the project. With most states having renewable portfolio standards and wanting to promote climate friendly generation alternatives, FTR markets facilitate lowering the cost of locational hedges for renewable projects, which is then passed on to consumers.

- *Generation Owners:* The FTR market is a valuable channel to help generation owners and developers to lock in prices for their future generation output and hedge their exposure to forward congestion price risk associated with selling power on a forward basis. Because liquidity for transacting with other market participants is poor at generation nodes, a generation owner/developer is exposed to congestion price risk when selling its power at liquid trading locations (e.g. Western Hub). FTR auctions- the competitively determined transparent locational auction prices- and the tradeable FTR instrument afford generation owners/developers many opportunities for effective pricing and hedging of congestion risk as far as four years forward. These include but are not limited to:
  - a. Purchasing FTRs in the auction to hedge against the congestion price risk of selling power on a forward basis,
  - b. Assessing the future value of developing generation at a particular location by utilizing the transparent locational long-term FTR auction prices, and
  - c. Transacting with a third party, such as a trader who has a robust FTR portfolio and is willing to manage forward congestion price risk, to lock in a forward fixed price for the generation owner/developer at its specific node(s) on the grid.

Without an FTR auction and the transparent forward locational prices the competitive process creates, a generation owner/developer's visibility into forward congestion values becomes limited and the options for managing forward congestion price become more expensive. Absent the FTR auction, a generation owner/developer who wishes to hedge its forward congestion risk would be left to participate in a bilateral market that is opaquer and less liquid than PJM's FTR auction market. Congestion hedge transactions would likely become more expensive, since the lack of forward locational congestion price transparency would lead to elevated risk premiums. Generation owners/developers would have

---

<sup>4</sup> Without FTR liquidity, many market participants may be unwilling to even enter the market for managing developers' basis risks. In this way the auction facilitates a valuable bilateral market that otherwise would not exist or would be far less efficient.

**ENERGY TRADING INSTITUTE  
POSITION PAPER 2019**

higher expenses for buying forward congestion hedges and in turn consumers would ultimately pay higher prices for electricity.

- *Traders:* Traders<sup>5</sup> participation in the FTR market provides liquidity and competition, not just in the FTR market but also in the broader energy market. Traders' participation in FTR auctions boosts competition for FTRs, making for more efficient valuation of ARR - a benefit to LSEs and their customers. Traders that build a portfolio of FTRs, in addition to their portfolios of other products, are positioned to compete to provide risk management and hedging services (e.g. forward price certainty) to LSEs, generation owners, and generation developers. This liquidity created by traders benefits LSEs and generation owners/developers by giving them more options for hedging their forward physical assets, which ultimately leads to competitive prices for consumers.
- *Lending Institutions:* Lending institutions who finance generation and transmission facilities often require the use of FTRs in conjunction with other bilateral transactions in order to hedge the risk of their investment. For example, bank A decides to finance a particular generation project, how will it price the necessary capital for the term of the loan? The lender will likely look at the current and projected cost of power, the forward cost of congestion, which is informed by the FTR market, the economics of that project and then assess a risk premium based on its analysis. If the lender has various price points and transparent long-term contracts, which the FTR market provides, it has better correlated information upon which to base its risk analysis and thus would not impose as significant of a risk premium that would have been required absent pricing data. This results in lowering the cost of new entry.<sup>6</sup>

Market participants cannot manage their forward risk at the same cost or with the same level of granularity with products offered outside of the RTO. Some in the stakeholder process have pointed out that the ability to contract in the forward market exists outside of the RTO market construct. This is true, but such transactions depend on the liquidity and competitiveness of the complementary FTR market. The RTO is the *only* place where a market participant can get a granular price for a specific location on the grid that accurately reflects a market-determined view of the fundamental price determinants at that location. The exchanges do not offer the nodal granularity provided

---

<sup>5</sup> While many people loosely refer to traders as “financial participants,” it is important to note that trading and financial participation occurs at various types of firms, such as those that own generation, those that serve load, those that finance assets (discussed in greater detail below) and those that are purely financial.

<sup>6</sup> Indeed, the transparency and liquidity from the FTR auction allows bank A's competitors to try to compete for providing congestion hedges, which in turn provides a disciplining effect on bank A and other competitors to ensure the most competitive price.

**ENERGY TRADING INSTITUTE  
POSITION PAPER 2019**

by the RTO and do not have available to them the information the RTO has that allows the RTO to update capacity figures and system changes. Similarly, exchange prices are significantly impacted by the liquidity in the FTR market. If the FTR market is illiquid, the exchange price will go up because market participants will not have enough pricing data to evaluate their risk and therefore, will build in significant risk premiums. The same thing occurs with regard to bilateral transactions. A counterparty offering a hedge contract will look at the exchanges and the RTO to determine an appropriate price for a given hedge contract. Without the RTO (the entity that manages and models the grid daily) offering granular, nodal FTR pricing data, the prices on the various exchanges and the prices of bilateral contracts will be distorted by risk premiums, negatively impacting consumers.

The ability to construct well-balanced hedge portfolios is extremely important to market participants that utilize FTRs. The granular and diverse nature of the current FTR construct is key to offering balanced portfolios that more precisely target a market participant's exposure to congestion risk. When paths are reduced or eliminated, this forces concentration onto other paths, distorts FTR prices, and decreases the ability of a market participant to diversify its portfolio. This in turn reduces the market participant's ability to match the hedge to the exact constraint exposure it faces and therefore to build in greater risk premiums to account for that additional risk, ultimately increasing the cost to consumers. For example, an LSE may have exposure to particular constraints and purchasing generator-to-generator paths creates the best hedge to those constraints based on the shift factors related to those nodes at that location. Limiting the availability of such paths for purchase in the FTR market will limit the LSE's ability to more exactly target and prevent its exposure to that constraint.

Another example that highlights the need for generation-to-generation paths is the integration of wind and solar resources. Wind and solar resources pose congestion challenges because particular geographic regions tend to be more conducive for developing such resources. When it is particularly sunny or windy, these plants will generate high output, which will contribute to transmission constraints. But if it is cloudy or not windy, it is possible congestion could reverse or shift against certain units. A wind plant would want to purchase an FTR path outside of that generation pocket to hedge against the congestion risk posed by a high output in that region. If you eliminate a generator-to-generator path, the wind generator would be forced to face the financial exposure of its FTR against a load node, zone or hub, when wind output is low. This would be a far less effective and riskier hedge for the wind plant.

In addition, all market participants want to obtain paths at extremely liquid locations, such as hubs and zones. There is a limited amount of capacity auctioned off at those locations and thus not every bidder will clear those paths in the auction. Market

## **ENERGY TRADING INSTITUTE POSITION PAPER 2019**

participants need to have alternative paths that offer them a financially similar opportunity to hedge their risk of future price volatility. Limiting the number of FTR paths or particular FTR path combinations would be counter to PJM's goal to offer products and ways to mitigate risk.

Longer-term FTR markets provide the liquidity and transparency necessary to more precisely value nodal prices on a locational basis to help market participants account for and hedge against changes to the grid and incent long-term infrastructure investment. As we move forward to achieve grid resiliency, fuel security and accommodate increased generation retirements, the power industry will depend on the forward curve to properly deploy capital. Without an accurate, forward price curve that is informed by forward congestion values from FTR auctions, suppliers, LSEs, traders, and financial institutions will have to build in larger risk premiums for congestion. The decision to reduce available paths for auction in the FTR markets will translate to reduced price transparency and hedging opportunities, which would effectively be a dead weight tax on consumers.

The reopening of the discussion around limiting available paths, path combinations, products or tenor is the result of a very unfortunate strategy employed by some to distract from what really happened within PJM with respect to the GreenHat default. The GreenHat default was the result of a flawed credit policy and a number of failures on the part of PJM management. The Institute commends PJM for the credit and management changes they have made thus far but wishes to outline key changes that must be the clear focus of the conversation at PJM in the months to come.

### [Background Regarding Credit and Risk Management](#)

Over the past two decades, there have only been two major defaults in the organized electricity markets - both occurred in PJM. Furthermore, both defaults occurred as a result of the defaulting companies being able to engage in zero-collateral strategies that effectively gamed the ineffective PJM credit policies at the time. These strategies were the very *raison d'être* of the two firms involved. Effective credit and risk management procedures, as described below, would have prevented both defaults. *Neither one of these defaults had anything to do with the structure of the FTR market.* In fact, the structure of the FTR market provided the transparency that led several financial market participants to voice concern regarding these positions and to advocate for better credit policies moving forward. The goal at PJM should be to establish credit policies that strike a balance between facilitating FTRs' unique roles in providing a market for congestion management in LMP markets, ultimately benefiting consumers, while simultaneously ensuring that there will be no material defaults by market participants in any of the markets facilitated by PJM.



## **ENERGY TRADING INSTITUTE POSITION PAPER 2019**

Trillions of dollars are exchanged daily in financial markets with well-developed systems to ensure safe market operation and credit protection. Ensuring adequate collateral and capitalization is a problem that has been largely resolved in other financial markets and the Federal Energy Regulatory Commission (FERC)-regulated markets must follow a similar path.

### Background Regarding Recent Default in PJM

In 2014, GreenHat joined the PJM market and began participating in the FTR market. Two of the principals of GreenHat had previously been investigated by the FERC and named in a public investigation. GreenHat amassed a large volume of forward positions in the FTR market. Almost all of the positions held by GreenHat were zero-credit transactions under the PJM credit policy in effect at that time. In fact, it appeared that GreenHat's criteria was to buy every FTR possible that had zero collateral regardless of the anticipated profitability of those paths. GreenHat quickly became the largest holder of FTR positions in the entire PJM market- nearly double the size of the second-ranking market participant who had been active in the market for over a decade.<sup>7</sup>

Many members of the financial community reached out to PJM, FERC and the Market Monitor to voice their concerns about: (1) the sheer volume traded by such a new market participant; (2) the financial risk posed by these positions; (3) the flaws in the PJM credit model that allowed GreenHat to amass such positions without posting collateral commensurate with the risk imposed by these transactions; and (4) the deteriorating market value and losses of the GreenHat portfolio over time. These members were ignored by PJM and the default exposure nearly doubled. The cost of this default is socialized among all the PJM membership at the time of the default and will continue to be assessed to those members for an uncertain period of time going forward, and these costs will be passed on to consumers. It is important to note that this default was the result of what is now recognized as a significantly flawed credit policy and a weak screening process of new membership applicants to the PJM market. The issue was in no way related to the design of the FTR market. In fact, the transparency in the FTR market allowed participants to flag the concern to PJM staff early on.

---

<sup>7</sup> *Report of the Independent Consultants on the GreenHat Default* (Independent Report), March 26, 2019 at P. 11 stated:

By the time of the default, the portfolio of auction transactions in total had reached 899 million MWh of FTR buys, netting to 836 million MWh (net of a small amount of FTRs sold back into the auction and in the bilateral market). A review of data since 2012 revealed that the GreenHat portfolio had in less than three years become one of the largest portfolios of FTRs in PJM history.

## Recommendations for Improved Credit Practices and Risk Management Protocols In PJM

ETI strongly suggests the following enhanced credit practices and risk management protocols be incorporated in PJM in order to enhance market confidence and ensure the maximum benefit to consumers:<sup>8</sup>

### Enhanced Credit Practices

- 1) *Develop an Effective Risk Model:* PJM should work with a team of experts to develop a risk model to be used to calculate daily margin. Currently, PJM utilizes a path by path credit approach, a per MWh minimum credit calculation and the undiversified adder, which triples the credit requirement for those market participants that are net short in the market. PJM should, in consultation with a team of experts, work to assess its collateral requirements to ensure they are appropriate when taking into consideration the credit policy changes that were recently implemented. As part of that process, PJM should assess whether it is holding enough collateral for positions purchased, whether a pre-pay method might be a better alternative, and whether it is holding enough collateral to cover potential reversals in congestion patterns. PJM should also consider portfolio modeling that would assess several worst-case scenarios. In addition, PJM should implement a daily variation margin requirement based on its risk model. Variation margin would require charging or refunding the difference between the purchase price and the current market value of FTR paths held by each market participant.
- 2) *Implement Additional Auctions as Practicable:* PJM should develop a work plan for implementing more frequent auctions within a Planning Year within the next four years. The technology to support and clear more frequent auctions is available. The Institute understands the inability to make this change quickly, but PJM should begin efforts to move expeditiously in this direction and become a leader in this regard. More frequent auctions will allow both market participants

---

<sup>8</sup> In order No. 741, the Commission correctly stated:

The organized wholesale electric markets have developed their own individual credit practices through their own tariff revisions crafted through their stakeholder processes. This evolutionary process has led to varying credit practices among the organized markets. Because the activity of market participants is not confined to any one region/market and because the credit rules differ in each market, a default in one market could weaken the credit worthiness of a given participant and have ripple effects in another market. In this way, the credit practices in all ISOs and RTOs may only be as strong as the weakest credit practice.

**ENERGY TRADING INSTITUTE  
POSITION PAPER 2019**

and PJM to more effectively manage their risk by offering more frequent price signals that would better inform PJM and market participants of the forward price of congestion. PJM should work to implement the rolling auction construct outlined in the Independent Report.

Enhanced Risk Management Protocols

- 1) *Chief Risk Officer (CRO)*: We commend PJM for its commitment to hire a CRO in the near future. It is important that the CRO report directly to the Board and have full access to all the necessary information within each department at PJM. Further, it is critical that the CRO have a sufficient budget to grow his or her team with the appropriate expertise to ensure the security of all markets within PJM. PJM should have a strongly skilled team in place that reports to the CRO and is solely responsible for reviewing risk in all the PJM markets. This team must be required to analyze mark-to-auction results, ensure variation margin is effectively managed, suggest rule changes as necessary, work with operations teams to assess any activity-based risk,<sup>9</sup> cross-market risks that are posed and set automatic triggers for requiring additional margin. This team must be tasked with looking across all market activity within to determine the overall risk posed by every market participant.
- 2) *Know-Your-Customer Protocols*: A know-your-customer policy should be implemented with the help of experts in this area. As part of that process, PJM should conduct a thorough evaluation of each company and its beneficial owners prior to accepting its membership and permitting its participation in the market. Such diligence must be ongoing for each member throughout the tenure of membership. In addition, the risk protocols of each market participant should be audited on a regular basis to ensure proper implementation.
- 3) *Transaction Limits*: Establish appropriate transaction limits for all products based on each member company's audited financial statements, total net worth and position tenor. Transaction limits should be clearly defined, with financial thresholds provided for both tenor and volume of positions. These requirements should be conservative in nature to cover the potential risk but not onerous so as to limit liquidity in the long-term markets.

---

<sup>9</sup> It is important to note that risk of default exists outside of the FTR market. Even if PJM moves towards a third-party clearing model, it is critical for PJM to have a robust credit and risk management team within the organization.

**ENERGY TRADING INSTITUTE  
POSITION PAPER 2019**

Conclusion

The Institute's recommendations outlined above are necessary to ensure secure, robust, competitive markets that ultimately benefit consumers. It is important that we prevent history from repeating itself by addressing lessons learned from the GreenHat default. We urge PJM and stakeholders to refocus the conversation to credit and management-based solutions in order to put protective measures in place in an expedited fashion. Many stakeholders voiced this same opinion during the June 6<sup>th</sup> Financial Risk Mitigation Senior Task Force. We look forward to working with PJM to become best in class.