

Financial Transmission and Auction Revenue Rights

In an LMP market, the lowest cost generation is dispatched to meet the load, subject to the ability of the transmission system to deliver that energy. When the lowest cost generation is remote from load centers, the physical transmission system permits that lowest cost generation to be delivered to load. This was true prior to the introduction of LMP markets and continues to be true in LMP markets. Prior to the introduction of LMP markets, contracts based on the physical rights associated with the transmission system were the mechanism used to provide for the delivery of low cost generation to load. Firm transmission customers who paid for the transmission system through rates were the beneficiaries of the system.

After the introduction of LMP markets, financial transmission rights permitted the loads which pay for the transmission system to continue to receive those benefits in the form of revenues which offset congestion to the extent permitted by the transmission system.¹ Financial transmission rights and the associated revenues were directly provided to loads in recognition of the fact that loads pay for the transmission system which permits low cost generation to be delivered to load and which creates the funds available to offset congestion costs in an LMP market.²

In PJM, Financial Transmission Rights (FTRs) were part of the market design from the inception of LMP markets on April 1, 1998.³ In PJM, FTRs were available to network service and long-term, firm, point-to-point transmission service customers as an offset to congestion costs from the inception of locational marginal pricing (LMP) on April 1, 1998.

Effective June 1, 2003, PJM replaced the allocation of FTRs with an allocation of Auction Revenue Rights (ARRs) and an associated Annual FTR Auction.^{4,5} Since then, all PJM members have been eligible to purchase FTRs in auctions. On June 1, 2007, PJM implemented marginal losses in the calculation of LMP. Since then,

FTRs have been valued based on the difference in congestion prices rather than the difference in LMPs. FTR funding has been based on both day ahead and balancing congestion revenues from its initial design.

PJM created the split between ARRs and FTRs in order to both continue to provide the appropriate protection against congestion for load, and to permit any excess transmission capacity on the system to be made available to those market participants who wished to use FTRs to speculate or to hedge positions. This separation substantively changed the definition of FTRs. FTRs no longer represent the rights of load to the congestion offset associated with the physical transmission system, but instead represent the potential offset to congestion costs associated with the excess capability of the transmission system to deliver energy over and above that assigned to ARRs.

Following the introduction of ARRs, it is ARRs which now have the characteristics and rationale that were associated with FTRs when FTRs were introduced. Consistent with this function, ARRs are directly allocated to loads which pay for transmission. ARRs and FTRs do not represent a right to the physical delivery of energy.

Firm transmission service customers have access to ARRs because firm transmission service customers pay the costs of the transmission system that enables firm energy delivery. ARRs provide firm transmission service customers with the financial equivalent of physically firm transmission service, without requiring physical transmission rights that are difficult to define and enforce. This financial equivalence is not limited to the Day-Ahead Energy Market. Firm transmission service customers receive requested ARRs to the extent that they are consistent both with the physical capability of the transmission system and with the ARR requests of other eligible customers. ARRs provide the holder with revenues, or charges, based on the price differences across ARR transmission paths and the capacity of those paths, which offset congestion costs. These price differences for ARRs result from the Annual FTR Auction. Network service and firm point-to-point transmission service customers can convert allocated ARRs to the underlying FTR through a process termed self scheduling.

Neither ARRs nor FTRs provide a guarantee that holders will receive compensation equal to the value of

¹ See 81 FERC ¶ 61,257, at 62,241 (1997).

² See *id.* at 62, 259–62,260 & n. 123.

³ *Id.*

⁴ 102 FERC ¶ 61,276 (2003).

⁵ 87 FERC ¶ 61,054 (1999).

congestion across the specific paths identified in their ARRs or FTRs. ARR and FTR holders do not need to physically deliver energy to receive ARR or FTR credits and neither instrument represents a right to the physical delivery of energy.

An FTR provides the holder with revenues, or charges, up to the difference in congestion prices in the Day-Ahead Energy Market across the specific FTR transmission path for each FTR MW. This maximum value is the target allocation of the FTR. This does not make FTRs a day ahead product, nor is the FTR holder guaranteed payments equal to its calculated target allocation. FTR funding has appropriately been based on both day ahead and balancing congestion revenues from its initial design.

FTRs are sold based on the system capability remaining after ARRs are allocated, in order to maximize grid usage and efficiency. FTRs can be used as a hedge against congestion, or to speculate on congestion costs across a certain transmission pathway. With the creation of ARRs, FTRs no longer serve their original function of providing firm transmission customers with the financial equivalent of physically firm transmission service. FTR holders, with the creation of ARRs, do not have the right to financially firm transmission service. Revenues to fund FTRs come from the congestion component of LMP in both the Day-Ahead and Balancing Energy Market. This has been part of the PJM market design from its inception. This market design feature helps ensure that payments to FTR holders remain grounded in actual congestion revenues including both day ahead and balancing thereby preventing FTR holders from receiving a windfall or a penalty if modeling in the FTR auction or the Day-Ahead Market differs from actual congestion in the Real-Time Energy Market.

Differences between calculated target allocations and actual congestion are expected as result of the difficulty of modeling FTRs. When actual congestion, measured as the sum of day ahead and balancing congestion on an FTR path, is less than the target allocation on that path, the FTR is termed underfunded or revenue inadequate. Underfunding and revenue inadequacy are misnomers because they appear to imply that the correct answer is that revenues must fully cover congestion on FTR paths. There is no guarantee of full revenue adequacy for FTRs. The mechanism that has the stated intent of

assuring full revenue adequacy for FTRs is in fact a mechanism for self funding of revenue adequacy. FTR holders themselves make up any shortfall. Rather than a revenue adequacy mechanism, this is a mechanism to ensure that revenue shortfalls on specific transmission paths are socialized among all FTR holders and that all FTR holders share in the shortfall proportionately.

The *2011 State of the Market Report for PJM* focuses on the annual ARR allocations, the Long Term FTR Auctions, the Annual FTR Auctions and the Monthly Balance of Planning Period FTR Auctions during two FTR/ARR planning periods: the 2010 to 2011 planning period which covers June 1, 2010, through May 31, 2011, and the 2011 to 2012 planning period which covers June 1, 2011, through May 31, 2012, as well as the Long Term FTR Auctions which cover June 1, 2012 through May 31, 2015.

Table 12-1 The FTR Auction Markets results were competitive

Market Element	Evaluation	Market Design
Market Structure	Competitive	
Participant Behavior	Competitive	
Market Performance	Competitive	Effective

- The market structure was evaluated as competitive because the FTR auction is voluntary and the ownership positions resulted from the distribution of ARRs and voluntary participation.
- Participant behavior was evaluated as competitive because there was no evidence of anti-competitive behavior in 2011.
- Performance was evaluated as competitive because it reflected the interaction between participant demand behavior and FTR supply, limited by PJM's analysis of system feasibility.
- Market design was evaluated as effective because the market design provides a wide range of options for market participants to acquire FTRs and a competitive auction mechanism.

Overview

Financial Transmission Rights

Market Structure

- **Supply.** The principal binding constraints limiting the supply of FTRs in the 2012 to 2015 Long Term FTR Auction include the Millville – Old Chapel line, approximately 40 miles northwest of Washington, D.C., and the Burr Oak Flowgate, approximately 60 miles west of Fort Wayne, IN. The principal binding constraints limiting the supply of FTRs in the Annual FTR Auction for the 2011 to 2012 planning period include the Doubs Transformer, approximately 20 miles northwest of Washington, D.C. and the Bartonsville – Stephens City line, approximately 60 miles west of Washington, D.C. The geographic location of these constraints is shown in Figure 12-1.

Market participants can also sell FTRs. In the 2012 to 2015 Long Term FTR Auction, total participant FTR sell offers were 251,290 MW, up from 177,540 MW during the 2011 to 2014 Long Term FTR Auction. In the Annual FTR Auction for the 2011 to 2012 planning period, total participant FTR sell offers were 337,510 MW, up from 178,428 MW during the 2010 to 2011 Annual FTR Auction. In the Monthly Balance of Planning Period FTR Auctions for the first seven months (June through December 2011) of the 2011 to 2012 planning period, total participant FTR sell offers were 3,984,782 MW, up from 2,706,728 MW for the same period during the 2010 to 2011 planning period.

- **Demand.** The PJM tariff specifies that PJM has the authority to limit the maximum number of FTR bids to 5,000 per participant for a monthly auction, or a single round of an annual auction, if necessary to avoid related system performance issues.⁶ On this basis, PJM currently limits the maximum number of bids that could be submitted by a participant for any individual period in an auction to 10,000 bids.

In the 2012 to 2015 Long Term FTR Auction, total FTR buy bids increased 1.3 percent from 400,222 MW to 405,504 MW. In the Annual FTR Auction total FTR buy bids and self scheduled bids increased

84.8 percent from 1,764,288 MW to 3,260,695 MW. The total FTR buy bids from the Monthly Balance of Planning Period FTR Auctions for the first seven months of the 2011 to 2012 (June through December 2011) planning period increased 42.3 percent from 8,973,645 MW, during the same time period of the prior planning period, to 12,767,075 MW.

As one of the measures to address underfunding, effective August 5, 2011, PJM no longer allows FTR buy bids to clear with a price of zero unless there is at least one constraint in the auction which affects the FTR path.

- **Credit Issues.** There were eight participants that defaulted during the 2011 calendar year and 12 default events. The average default for the 2011 calendar year was \$282,721 with a maximum default of \$2.55 million. Of all the defaults eight were based on collateral and four were based on payments. Six of the eight defaulting participants were financial companies. All of the credit defaults were promptly cured in the 2011 calendar year.⁷ These defaults were not related to FTR positions.
- **Credit Rules Changes.** On September 15, 2011, the FERC conditionally approved PJM's proposed revisions to its credit policy filed in compliance with FERC's Order No. 741, which required tighter credit standards for all RTOs.⁸

As a result of these new requirements, most PJM members complied with PJM's new minimum financial requirements effective October 1, 2011. Based on submitted information, 17 members did not meet the new requirements. Of these 17, 16 opted to reduce or discontinue their transaction activity and one did not comply, and was declared in default. These 17 members accounted for 0.1 percent of the aggregate bids in the 2011 to 2012 Annual FTR auction.⁹

- **Patterns of Ownership.** The ownership concentration of cleared FTR buy bids resulting from the 2011 to 2012 Annual FTR Auction was low for peak and off

⁶ OA Schedule 1 § 7.3.5(d).

⁷ Email to Members Committee, "PJM Settlement Member Credit Exposure – End of December 2011," January 12, 2012.

⁸ *PJM Interconnection, L.L.C.*, 136 FERC ¶61,190 (September 15th Order); see also *Credit Reforms in Organized Wholesale Electric Markets*, Order No. 741, FERC Stats. & Regs. ¶31,317 (2010), order on reh'g, Order No. 741-A, FERC Stats. & Regs. ¶31,320, reh'g denied, Order No. 741-B, 135 FERC ¶61,242 (2011).

⁹ It is not possible to evaluate the impact on members which members did not report.

peak FTR obligations and moderately concentrated for 24-hour FTR obligations. The ownership concentration was also low for peak and off peak FTR buy bid options and highly concentrated for 24-hour FTR buy bid options for the same time period. The level of concentration is only descriptive and is not a measure of the competitiveness of FTR market structure as the ownership positions resulted from a competitive auction.

For the 2012 through 2015 Long Term FTR Auction, financial entities purchased 90 percent of prevailing flow FTRs and 94 percent of counter flow FTRs. In the Annual FTR Auction, planning period 2011 through 2012, financial entities purchased 56 percent of prevailing flow FTRs and 85 percent of counter flow FTRs. For the Monthly Balance of Planning Period Auctions, financial entities purchased 83 percent of prevailing flow and 90 percent of counter flow FTRs for the 2011 calendar year. Financial entities owned 51.5 percent of all prevailing and counter flow FTRs, including 45.8 percent of all prevailing flow FTRs and 68.3 percent of all counter flow FTRs during the same time period.

Market Performance

- **Volume.** The 2012 to 2015 Long Term FTR Auction cleared 259,885 MW (10.8 percent of demand) of FTR buy bids, compared to 238,681 MW (12.0 percent) in the 2011 to 2014 Long Term FTR Auction. The 2012 to 2015 Long Term FTR Auction also cleared 31,288 MW (12.5 percent) of FTR sell offers, up from 12,501 MW (7.0 percent) in the 2011 to 2012 Long Term FTR Auction.

For the 2011 to 2012 planning period, the Annual FTR Auction cleared 341,726 MW (10.6 percent) of FTR buy bids, compared to 231,663 MW (13.6 percent) for the 2010 to 2011 planning period. The 2011 to 2012 Annual FTR Auction also cleared 24,960 MW (7.4 percent) of FTR sell offers for the 2011 to 2012 planning period, up from 10,315 MW (5.8 percent) for the 2010 to 2011 planning period.

For the first seven months of the 2011 to 2012 planning period, the Monthly Balance of Planning Period FTR Auctions cleared 1,589,990 MW (12.5 percent) of FTR buy bids and 427,443 MW (10.7 percent) of FTR sell offers.

- **Price.** In the 2012 to 2015 Long Term FTR Auction, more Long Term FTRs were purchased for less than \$1 than in the prior Long Term Auction. The weighted-average price for 24-hour buy bids in the Long Term FTR Auction rose from -\$0.16 to \$0.36 per MW. Counter flow buy bid prices were negative, but greater in absolute value, than prevailing flow FTR bid prices.

For the 2011 to 2012 Annual Auction, slightly fewer FTRs were purchased for less than \$1 than in the prior Annual Auction. The weighted-average price for 24-hour buy bid obligations in the 2011 to 2012 planning period was \$0.68 per MW, up from \$0.43 in the 2010 to 2011 planning period.

The weighted-average buy-bid FTR price in the Monthly Balance of Planning Period FTR Auctions for the first seven months of the 2011 to 2012 planning period was \$0.13, down from \$0.17 per MW in the first seven months of the 2010 to 2011 planning period.

- **Revenue.** The 2012 to 2015 Long Term FTR Auction generated \$20.5 million of net revenue for all FTRs, down from \$49.8 million in the 2011 to 2014 Long Term FTR Auction and the lowest net revenue since the Long Term FTR Auction's inception. This drop in net revenue is largely due to a 106.2 percent increase in revenue for sell offers from the 2011 to 2014 Long Term FTR Auction, along with a 29.5 percent drop in prevailing flow FTR buy bids.

The 2011 2012 planning period Annual FTR Auction generated \$1,029.7 million of net revenue for all FTRs, down from \$1,049.8 million for the 2010 to 2011 planning period.

The Monthly Balance of Planning Period FTR Auctions generated \$21.9 million in net revenue for all FTRs for the first seven months of the 2011 to 2012 planning period, up from \$16.7 million for the same time period in the 2010 to 2011 planning period.

- **Revenue Adequacy.** FTRs were paid at 85.0 percent of the target allocation for the 2010 to 2011 planning period. FTRs were paid at 84.9 percent of the target allocation level for the first seven months of the 2011 to 2012 planning period. Congestion revenues are allocated to FTR holders based on FTR

target allocations. PJM collected \$570.3 million of FTR revenues during the first seven months of the 2011 to 2012 planning period and \$1,430.7 million during the 2010 to 2011 planning period. For the first seven months of the 2011 to 2012 planning period, the top sink and top source with the highest positive FTR target allocations were AEP without Mon Power and the Western Hub. Similarly, the top sink and top source with the largest negative FTR target allocations were AEP without Mon Power and Kammer.

- **Profitability.** FTR profitability is the difference between the revenue received for an FTR and the cost of the FTR. The cost of self scheduled FTRs is zero in the FTR profitability calculation. FTRs were profitable overall, with \$340.3 million in profits for physical entities, of which \$560.5 million was from self scheduled FTRs, and \$125.7 million for financial entities. FTR profits generally increased in the summer and winter months when congestion was higher and decreased in the shoulder months when congestion was lower. As shown in Table 12-24, not every FTR was profitable. For example, prevailing flow FTRs purchased by physical entities, but not self scheduled, were not profitable in 2011. Prevailing flow FTRs, purchased by financial entities, were not profitable in 2011.

Auction Revenue Rights

Market Structure

- **Supply.** ARR supply is limited by the capability of the transmission system to simultaneously accommodate the set of requested ARRs and the numerous combinations of feasible ARRs. The principal binding constraints that limited supply in the annual ARR allocation for the 2011 to 2012 planning period were the South Mahwah – Waldwick line, in northern New Jersey, and the East Frankfort – Crete line, approximately 20 miles south of Chicago, IL. The geographic location of these constraints is shown in Figure 12-1. Long Term ARRs are in effect for 10 consecutive planning periods and are available in Stage 1A of the annual ARR allocation. Residual ARRs are available to holders with prorated Stage 1A or 1B ARRs if additional transmission capability is added during the planning period.

- **Demand.** Total requested volume in the annual ARR allocation was 148,538 MW for the 2011 to 2012 planning period with 64,160 MW requested in Stage 1A, 22,208 MW requested in Stage 1B and 57,053 MW requested in Stage 2. This is up from 135,614 MW for the 2010 to 2011 planning period with 61,793 MW requested in Stage 1A, 37,850 MW requested in Stage 1B and 45,971 MW requested in Stage 2. The ATSI integration accounted for 5,434 MW of increased demand. The total ARR volume allocated is limited by the amount of network service and firm point-to-point transmission service.
- **ARR Reassignment for Retail Load Switching.** There were 24,531 MW of ARRs associated with approximately \$388,700 of revenue that were reassigned in the first seven months of the 2011 to 2012 planning period. There were 56,296 MW of ARRs associated with approximately \$1,043,700 of revenue that were reassigned for the full twelve months of the 2010 to 2011 planning period.

Market Performance

On June 1, 2011, the American Transmission Systems, Inc. (ATSI) Control Zone was integrated into PJM. Network Service Users and Firm Transmission Customers in the ATSI Control Zone participated in the 2011 to 2012 Annual ARR Allocation. For a transitional period, those customers that receive, and pay for, firm transmission service that sources or sinks in newly integrated PJM control zones may elect to receive a direct allocation of FTRs instead of an allocation of ARRs. This transitional period covers the succeeding two Annual FTR Auctions after the integration of the new zone into PJM. In the 2011 to 2012 planning period 5,434 MW of ARRs were requested and 2,770 MW were allocated (51 percent) and 7,750 MW of directly allocated FTRs were requested while 4,189 MW were allocated (54 percent).

- **Volume.** Of 148,538 MW in ARR requests for the 2011 to 2012 planning period, 102,476 MW (69.0 percent) were allocated. Market participants self scheduled 46,017 MW (44.9 percent) of these allocated ARRs as Annual FTRs. Of 135,614 MW in ARR requests for the 2010 to 2011 planning period, 101,843 MW (75.1 percent) were allocated. Market participants self scheduled 55,732 MW (54.6 percent) of these allocated ARRs as Annual FTRs.

- **Revenue.** There are no ARR revenues. ARRs are allocated to qualifying customers because they pay for the transmission system.
- **Revenue Adequacy.** For the 2011 to 2012 planning period, the ARR target allocations were \$947.3 million while PJM collected \$1,051.8 million from the combined Long Term, Annual and Monthly Balance of Planning Period FTR Auctions through December 31, 2011, making ARRs revenue adequate. For the 2010 to 2011 planning period, the ARR target allocations were \$1,028.8 million while PJM collected \$1,066.9 million from the combined Long Term, Annual and Monthly Balance of Planning Period FTR Auctions, making ARRs revenue adequate.
- **ARR Proration.** Stage 1A ARR requests may not be prorated. Some of the requested ARRs for the 2011 to 2012 planning period were prorated in Stage 1B and Stage 2 as a result of binding transmission constraints. For the 2010 to 2011 planning period, no ARRs were prorated in Stage 1B of the annual ARR allocation.
- **ARRs and FTRs as an Offset to Congestion.** The effectiveness of ARRs as an offset to congestion can be measured by comparing the revenue received by ARR holders to the congestion costs experienced by these ARR holders in the Day-Ahead Energy Market and the balancing energy market. For the 2010 to 2011 planning period, the total revenues received by ARR holders, including self scheduled FTRs, more than covered the congestion costs experienced by these ARR holders in the Day-Ahead Energy Market and the balancing energy market. For the 2010 to 2011 planning period, the total revenues received by the holders of all ARRs and FTRs offset more than 97.0 percent of the total congestion costs within PJM. During the first seven months of the 2011 to 2012 planning period, the total revenues received by the holders of all ARRs and FTRs offset more than 100 percent of the total congestion costs within PJM.

Conclusion

The annual ARR allocation provides firm transmission service customers with the financial equivalent of physically firm transmission service, without requiring physical transmission rights that are difficult to define

and enforce. The fixed charges paid for firm transmission services result in the transmission system which provides physically firm transmission service. With the creation of ARRs, FTRs no longer serve their original function of providing firm transmission customers with the financial equivalent of physically firm transmission service. FTR holders, with the creation of ARRs, do not have the right to financially firm transmission service. FTR holders do not have the right to revenue adequacy.

PJM created the split between ARRs and FTRs in order to both continue to provide the appropriate protection against congestion for load, and to permit any excess transmission capacity on the system to be made available to those market participants who wished to use FTRs to speculate or to hedge positions. The FTR auctions provide market participants with the opportunity to hedge positions or to speculate and permits ARR holders to convert ARRs into FTRs. The Long Term FTR Auction, the Annual FTR Auction and the Monthly Balance of Planning Period FTR Auctions provide a market valuation of FTRs. The FTR auction results for the 2011 to 2012 planning period were competitive and succeeded in providing all qualified market participants with equal access to FTRs.

Based on the FTR target allocations, there has been significant underfunding of FTRs since the spring of 2010. Underfunding or revenue inadequacy occurs when total congestion, which is comprised of day-ahead congestion plus balancing congestion, is less than the FTR target allocation. Total congestion revenues are allocated to FTR holders based on FTR target allocations.¹⁰ FTRs were paid at 85.0 percent of the target allocation level for the 2010 to 2011 planning period. FTRs were paid at 84.9 percent of the target allocation level for the first seven months of the 2011 to 2012 planning period. Revenue adequacy for a planning period is not final until the end of the period. Underfunding and revenue inadequacy are misnomers because they appear to imply that the correct answer is that revenues must fully cover congestion on FTR paths, the target allocations. There is no guarantee of full revenue adequacy for FTRs. The mechanism that has the stated intent of assuring full revenue adequacy for FTRs is in fact a mechanism for self funding of revenue adequacy. FTR holders themselves make up any

¹⁰ PJM Financial Transmission Rights Task Force (FTRTF), <<http://pjm.com/committees-and-groups/task-forces/ftrtf.aspx>>.

shortfall. Rather than a revenue adequacy mechanism, this is a mechanism to ensure that revenue shortfalls on specific transmission paths are socialized among all FTR holders and that all FTR holders share in the shortfall proportionately.

PJM is attempting to meet two competing objectives in determining the level of FTRs to offer in FTR auctions. Funding FTRs is a valid objective. Maximizing the efficient usage of the transmission system by increasing the level of offered FTRs is also a valid objective. FTR underfunding reflects PJM's efforts to balance competing objectives. FTR revenue shortfalls are not evidence that there is any deficiency with PJM's approach. PJM could effectively guarantee full funding of FTRs by using more conservative assumptions in its auction model. But that would inappropriately tilt toward one end of the tradeoff between revenue sufficiency and maximizing the availability of FTRs. It is not clear whether there would be any revenue shortfalls if PJM had not created separate ARR and FTR products but had continued to assign FTRs based on the purchase of transmission service.

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 offered by PJM are reduced transmission capability and the difficulty of modeling Midwest Independent System Operator, Inc. ("MISO") flowgates in the FTR Auction model. These both result in over selling FTRs. Over selling FTRs 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.

Both of the cited reasons resulted in PJM selling more FTR capability in the FTR auctions than exists. This was a result of the fact that FTR auctions are run well before the time that congestion is experienced and reality does not always match the model used in the auction to define available FTRs. The difficulty in predicting flows on PJM/MISO flowgates used in market-to-market congestion management and the reduction in overall transmission capability in turn results in differences between day-ahead models and actual experience in real time.

FTR holders do not have guarantees from PJM or PJM transmission customers that their payments would depend on modeling assumptions in the day-ahead market rather than total congestion. FTR holders cannot reasonably expect that such payments would ignore balancing congestion. It would be inappropriate to have FTR holders' revenues depend solely on modeling assumptions rather than on actual total congestion, including balancing congestion.

Underfunding is a logical consequence of overselling FTRs. When FTRs are oversold, a decline in their value can be expected. A reduction in FTR revenue sufficiency is a market signal and a correct market signal. The level of FTRs sold reflects PJM's judgment. The logical conclusion is not that underfunding must be eliminated through a change in the funding mechanism but that it is an expected consequence of the ongoing transmission upgrades on the system, the unanticipated level of congestion on MISO flowgates, and PJM's choices about the level of FTRs sold. If full funding is the goal, fewer FTRs should be sold, reflecting the reduced capability of the transmission system.

The notion that underfunding is a problem that should be solved through external subsidies depends on the assertion that FTR holders are guaranteed payments based on the definition of target allocations. Target allocations serve as a cap on FTR payments by time period and therefore define the amount of over collections that are spread to other periods. Target allocations do not establish an entitlement to any level of funding. FTR holders are not entitled to such a guarantee backed by an allocation of shortfalls to all transmission customers. FTR holders do not have a reasonable expectation of funding at that level. The valuation of FTRs by purchasers includes market risk. Market participants appropriately bear this risk and they should not be permitted to shift those risks to others. FTR holders are in position to assess the value of the FTRs that they purchase. If they are wrong, they appropriately bear the risks. It is a fundamental precept of market design that market participants should bear the risks associated with their decisions. External subsidies should not be introduced in order to attenuate that link. That would distort incentives and correspondingly distort market decisions.

The value of FTRs is determined by the revenue available to fund them. The value of FTRs is not determined by the target allocation. FTRs are financial products which serve a number of market functions from hedging to speculation. FTRs are voluntarily purchased in the market.

It has been suggested by some market participants that balancing congestion should be paid by all transmission customers, regardless of ARR allocations. But it has not been explained why transmission customers who did not purchase FTRs should play a role in funding FTRs by absorbing balancing congestion. Nor has it been explained why creating another unavoidable uplift charge with no causal link to those paying it is superior to continuing to have the market value FTRs, and have FTR purchasers make rational decisions about how much to pay for FTRs based on expectations about available congestion revenues. The current approach results in an appropriate match between the decision maker and the result. The introduction of a subsidy financed through an uplift charge would disrupt the link between the decision maker and the result.

Until the fundamental issues underlying FTR funding can be addressed, that level of revenue sufficiency will continue to be a correct market signal. FTR holders can pay less for FTRs if they believe that their value has been reduced, or PJM can make fewer FTRs available. These are very similar outcomes.

PJM and its stakeholders identified discrepancies between auction modeling and actual system conditions as the primary drivers of the underfunding. These discrepancies included outages not modeled in the annual or monthly auctions and additional transmission switching decisions not incorporated in the model. The impact of including balancing congestion in the calculation of revenues was also noted.¹¹ Although the annual FTR auction represents the entire year, the auction model reflects the PJM system for a single point in time. PJM must evaluate transmission line outage schedules and thermal operating limits for transmission lines for inclusion in the model for the Annual FTR Auction. FTR revenue adequacy is not guaranteed nor

should it be. PJM should model the system as accurately as possible and participants should bid prices that reflect their evaluations of the expected profitability of FTRs.

The MMU recommends that a detailed review of the ARR/FTR allocation and market clearing be conducted in order to better understand and address the reasons for FTR underfunding. This review should include the assumptions made in the modeling of auctions and their basis in market developments. The MMU also recommends an explicit statement in the rules explaining the purpose and objectives of ARRs, FTRs and the appropriate level of funding of FTRs. The MMU recommends that no action to substantially modify the market design, e.g. removal of balancing congestion from the calculation of FTR revenues, be taken until the review is complete.

For the 2010 to 2011 planning period, the total revenues received by the holders of all ARRs and FTRs offset more than 97.0 percent of the total congestion costs within PJM. During the first seven months of the 2011 to 2012 planning period, the total revenues received by the holders of all ARRs and FTRs offset more than 100 percent of the total congestion costs within PJM. The ARR and FTR revenue offset results are aggregate results and all those paying congestion charges did not necessarily receive that level of offset. Aggregate numbers do not reveal the underlying distribution of ARR and FTR holders, their revenues or those paying congestion.

The MMU also recommends that when load switches among LSEs during the planning period, a proportional share of the underlying self scheduled FTRs follow the load in the same manner that ARRs do. ARRs are assigned to firm transmission service customers because these customers pay the costs of the transmission system that enables firm energy delivery. Positively valued ARRs follow load when load switches between suppliers. The self scheduled FTRs are obtained as the direct result of the ARR assignment and should therefore follow the reassignment of ARRs when load switches in order to ensure that the new LSE is in the same competitive position as the LSE that lost load.

¹¹ The Market Implementation Committee (MIC) approved the creation of the Financial Transmission Rights Task Force (FTRTF) to investigate the causes of the FTR revenue inadequacy that occurred in the 2010 to 2011 Planning Period and identify potential improvements that could be made to minimize the revenue inadequacy going forward.

Financial Transmission Rights

While FTRs have been available to eligible participants since the 1998 introduction of LMP, the Annual FTR Auction was first implemented for the 2003 to 2004 planning period. Since the 2006 to 2007 planning period, the auction has covered all control zones.

FTRs are financial instruments that entitle their holders to receive revenue or require them to pay charges based on locational congestion price differences in the Day-Ahead Energy Market across specific FTR transmission paths. Effective June 1, 2007, PJM added marginal losses as a component in the calculation of LMP.¹² The value of an FTR reflects the difference in congestion prices rather than the difference in LMPs, which includes both congestion and marginal losses. Auction market participants are free to request FTRs between any pricing nodes on the system, including hubs, control zones, aggregates, generator buses, load buses and interface pricing points. FTRs are available to the nearest 0.1 MW. The FTR target allocation is calculated hourly and is equal to the product of the FTR MW and the congestion price difference between sink and source that occurs in the Day-Ahead Energy Market. The value of an FTR can be positive or negative depending on the sink minus source congestion price difference, with a negative difference resulting in a liability for the holder. The FTR target allocation is a cap on what FTR holders can receive. Revenues above that level are used to fund FTRs which received less than their target allocations.

Depending on the amount of FTR revenues collected, FTR holders with a positively valued FTR may receive congestion credits between zero and their target allocations. Revenues to fund FTRs come from both day-ahead congestion charges on the transmission system and balancing congestion charges. FTR holders with a negatively valued FTR are required to pay charges equal to their target allocations. When FTR holders receive their target allocations, the associated FTRs are fully funded. The objective function of all FTR auctions is to maximize the bid-based value of FTRs awarded in each auction.

FTRs can be bought, sold and self scheduled. Buy bids are FTRs that are bought in the auctions; sell offers

are existing FTRs that are sold in the auctions; and self scheduled bids are FTRs that have been directly converted from ARRs in the Annual FTR Auction.

There are two FTR hedge type products: obligations and options. An obligation provides a credit, positive or negative, equal to the product of the FTR MW and the congestion price difference between FTR sink (destination) and source (origin) that occurs in the Day-Ahead Energy Market. An option provides only positive credits and options are available for only a subset of the possible FTR transmission paths.

There are three FTR class type products: 24-hour, on peak and off peak. The 24-hour products are effective 24 hours a day, seven days a week, while the on peak products are effective during on peak periods defined as the hours ending 0800 through 2300, Eastern Prevailing Time (EPT) Mondays through Fridays, excluding North American Electric Reliability Council (NERC) holidays. The off peak products are effective during hours ending 2400 through 0700, EPT, Mondays through Fridays, and during all hours on Saturdays, Sundays and NERC holidays.

PJM operates an Annual FTR Auction for all participants. In addition PJM conducts Monthly Balance of Planning Period FTR Auctions for the remaining months of the planning period, which allows participants to buy and sell residual transmission capability. PJM also runs a Long Term FTR Auction for the three consecutive planning years immediately following the planning year during which the Long Term FTR Auction is conducted. FTR options are not available in the Long Term FTR Auction. A secondary bilateral market is also administered by PJM to allow participants to buy and sell existing FTRs. FTRs can also be exchanged bilaterally outside PJM markets.

FTR buy bids and sell offers may be made as obligations or options and as any of the three class types. FTR self scheduled bids are available only as obligations and 24-hour class types, consistent with the associated ARRs, and only in the Annual FTR Auction.

Market Structure

Any PJM member can participate in the Long Term FTR Auction, the Annual FTR Auction and the Monthly Balance of Planning Period FTR Auctions.

¹² For additional information on marginal losses, see the 2011 *State of the Market Report for PJM*, Volume II, Section 10, "Congestion and Marginal Losses," at "Marginal Losses."

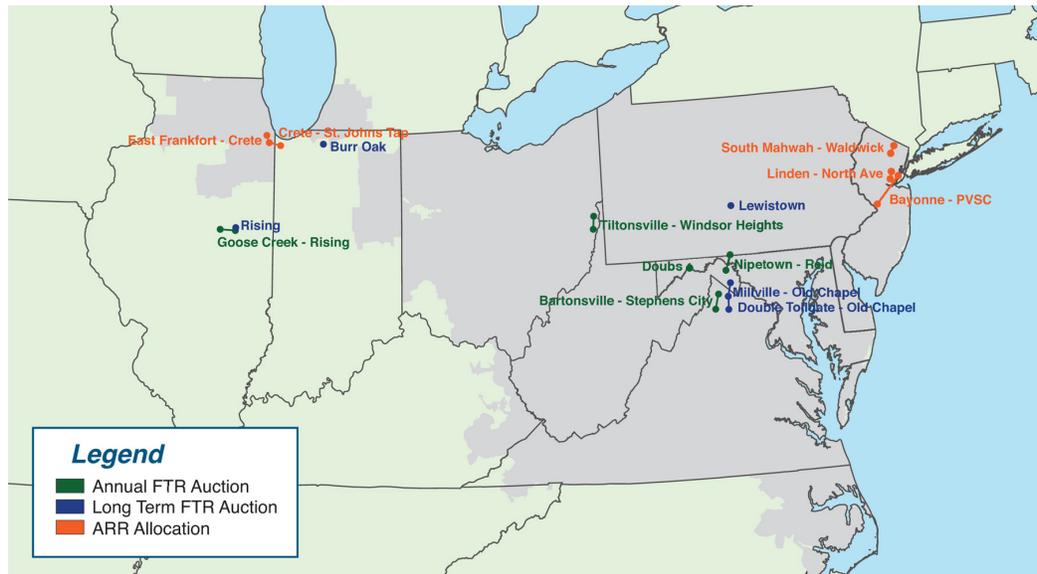
Supply and Demand

PJM oversees the process of selling and buying FTRs through FTR Auctions. Market participants purchase FTRs by participating in Long Term, Annual and Monthly Balance of Planning Period FTR Auctions.¹³ FTRs can also be traded between market participants through bilateral transactions. ARR may be self scheduled as FTRs for participation only in the Annual FTR Auction. Total FTR supply is limited by the capability of the transmission system to simultaneously accommodate the set of requested FTRs and the numerous combinations of FTRs that are feasible. For the Annual FTR Auction, known transmission outages that are expected to last for two months or more are included in the model, while known outages of five days or more are included in the model for the Monthly Balance of Planning Period FTR Auctions as well as any outages of a shorter duration that PJM determines would cause FTR revenue inadequacy if not modeled.¹⁴ But the auction process does not account for the fact that significant transmission outages, which have not been provided to PJM by transmission owners prior to the auction date, will occur during the periods covered by the auctions. Such transmission outages may not be planned in advance or may be emergency in nature. In addition, it is difficult to model two outages of similar significance and similar duration which do not overlap in time. The choice of which to model may have distributional consequences.

During the 2011 to 2012 planning period, binding transmission constraints prevented the award of all requested FTRs in the Long Term FTR Auction, the Annual FTR Auction and Monthly Balance of Planning

Period FTR Auctions.¹⁵ Table 12-2 and Table 12-3 list the top 10 binding constraints along with their corresponding control zones in the Long Term FTR Auction and the Annual FTR Auction. They are listed in order of severity, irrespective of auction round. For each of the top 10 binding constraints, a numerical ranking in order of severity for each auction round is also listed. The order of severity is determined by the marginal value of the binding constraint. The marginal value measures the value gained by relieving a constraint by 1 MW. The marginal value is computed and generated in the optimization engine for both on peak and off peak hours.¹⁶ Table 12-2 and Table 12-3 demonstrate the marginal value for on peak hours only. The top five binding transmission constraints for the Long Term FTR Auction and the Annual FTR Auction can be seen in Figure 12-1.

Figure 12-1 Geographic location of top five binding constraints for the Long Term and Annual FTR Auctions and ARR allocations: Planning periods 2012 to 2015 and 2011 to 2012



¹³ See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 38.

¹⁴ See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 54.

¹⁵ Binding constraints for Monthly Balance of Planning Period Auctions are posted to the PJM website in monthly files at <<http://www.pjm.com/markets-and-operations/ftr/auction-user-info/historical-ftr-auction.aspx>>.

¹⁶ See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 57.

Table 12-2 Top 10 principal binding transmission constraints limiting the Long Term FTR Auction: Planning periods 2012 to 2015

Constraint	Type	Control Zone	Severity Ranking by Auction Round		
			1	2	3
Millville - Old Chapel	Line	AP	NA	1	NA
Burr Oak	Flowgate	MISO	NA	2	8
Lewistown	Transformer	PENELEC	NA	NA	1
Double Tollgate - Old Chapel	Line	AP	1	5	13
Rising	Flowgate	MISO	NA	NA	2
Belmont	Transformer	AP	2	3	6
Bartonsville - Stephens City	Line	AP	3	NA	NA
31st Street - Westfall	Line	PENELEC	NA	NA	3
Clinton - Findlay	Line	DLCO	NA	NA	4
Roxbury - Shade Gap	Line	PENELEC	7	4	NA

Table 12-3 Top 10 principal binding transmission constraints limiting the Annual FTR Auction: Planning period 2011 to 2012

Constraint	Type	Control Zone	Severity Ranking by Auction Round			
			1	2	3	4
Doubs	Transformer	AP	NA	1	1	1
Bartonsville - Stephens City	Line	AP	NA	2	NA	NA
Goose Creek - Rising	Flowgate	MISO	NA	4	2	2
Tiltsville - Windsor	Line	AP	43	5	4	3
Nipetown - Reid	Line	AP	NA	3	3	4
Bedington - Harmony	Line	AP	NA	6	5	5
Palisades - Cook	Flowgate	MISO	NA	9	12	14
Mahans Lane - Tidd	Line	AEP	3	7	7	6
Belmont	Transformer	AP	NA	8	8	7
Wolfcreek	Transformer	AEP	NA	10	10	11

Long Term FTR Auction

PJM conducts a Long Term FTR Auction for the next three consecutive planning periods. The capacity offered for sale in Long Term FTR Auctions is the residual system capability assuming that all ARRs allocated in the prior annual ARR allocation process are self scheduled as FTRs. These ARRs are modeled as fixed injections and withdrawals in the Long Term FTR Auction. Future transmission upgrades are not included in the model. The 2009 to 2012 and 2010 to 2013 Long Term FTR Auctions consisted of two rounds.¹⁷ The 2011 to 2014 and 2012 to 2015 Long Term FTR Auctions consisted of three rounds. FTRs purchased in prior rounds may be offered for sale in subsequent rounds. FTRs obtained in

the Long Term Auctions may have terms of any one year or a single term of all three years.

- **Round 1.** The first round is conducted in the June prior to the start of the term covered by the Long Term FTR Auction. Market participants make offers for FTRs between any source and sink. These offers can be 24-hour, on peak or off peak FTR obligations. FTR option products are not available in Long Term FTR Auctions.
- **Round 2.** The second round is conducted approximately three months after the first round and follows the same rules as Round 1.
- **Round 3.** The third round is conducted approximately six months after the first round and follows the same rules as Round 1.

Annual FTR Auction

Each April, PJM conducts an Annual FTR Auction in which all eligible market participants may bid on FTRs for the next planning period consistent with total transmission system capability, excluding FTRs approved in prior Long Term FTR Auctions. If participants wish to self schedule ARRs as FTRs, it must be done in the first round of the Annual FTR Auction. Self scheduled FTRs must have the same source and sink as the corresponding ARR. Self scheduled FTRs clear as price-taking FTR bids that are not eligible to set auction price. The auction takes place over four rounds with 25 percent of the feasible transmission system capability awarded in each round:

- **Round 1.** Market participants make offers for FTRs between any source and sink. These offers can be 24-hour, on peak or off peak FTR obligations or FTR options. Locational prices are determined by maximizing the net revenue based on offer-based value of FTRs.¹⁸ Any transmission service customer or PJM member can bid for available FTRs. ARR holders wishing to directly convert their previously allocated ARRs into self scheduled FTRs must do so in this round. One quarter of each self scheduled FTR clears as a 24-hour FTR in each of the four rounds.

¹⁷ FERC approved, on December 7, 2009, the addition of a third round to the Long Term FTR Auction. FERC letter order accepting PJM Interconnection, LLC's revisions to Long-Term Financial Transmission Rights Auctions to its Amended and Restated Operating Agreement and Open Access Transmission Tariff, Docket No. ER10-82-000 (December 7, 2009).

¹⁸ Long Term, Annual and Monthly Balance of Planning Period FTR Auctions determine nodal prices as a function of market participants' FTR bids and binding transmission constraints. An optimization algorithm selects the set of feasible FTR bids that produces maximum net revenue, thus maximizing the value of transmission assets. A feasible set of FTR bids is a set that does not impose a flow on any transmission facility in excess of its rating.

- **Rounds 2 to 4.** Market participants make offers for FTRs. Locational prices are determined by maximizing the offer-based value of FTRs cleared. FTRs purchased in earlier rounds can be offered for sale in later rounds.

By self scheduling ARR as price-taking bids in the Annual FTR Auction, customers with ARRs receive FTRs for their ARR paths. ARR holders are guaranteed that they will receive their requested FTRs. ARRs can be self scheduled only as 24-hour FTR obligations. ARR holders that self schedule ARRs as FTRs still hold the associated ARR. Self scheduling transactions net out such that the ARR holder buys the FTR in the auction, receives offsetting revenue for the ARR and is left with the FTR and any revenues associated with it.

The following is an example of self scheduling ARRs as FTRs. An ARR holder receives an allocation of 1 MW from source A to sink B. The ARR holder self schedules the ARR as an FTR in the Annual FTR Auction. The price for a 1 MW FTR from A to B is \$100. The ARR holder pays \$100 to buy the 1 MW FTR and receives a \$100 ARR target credit based on the ARR. In addition, the ARR holder obtains the corresponding FTR.

Monthly Balance of Planning Period FTR Auctions

The residual capability of the PJM transmission system after the Long Term and Annual FTR Auctions are concluded is offered in the Monthly Balance of Planning Period FTR Auctions. These are single-round monthly auctions that allow any transmission service customers or PJM members to bid for any FTR or to offer for sale any FTR that they currently hold. Market participants can bid for or offer monthly FTRs for any of the next three months remaining in the planning period, or quarterly FTRs for any of the quarters remaining in the planning period. FTRs in the auctions include obligations and options and 24-hour, on peak or off peak products.¹⁹

Secondary Bilateral Market

Market participants can buy and sell existing FTRs through the PJM-administered, bilateral market, or market participants can trade FTRs among themselves without PJM involvement. Bilateral transactions that are not done through PJM can involve parties that are

not PJM members. PJM has no knowledge of bilateral transactions that are done outside of PJM's bilateral market system.

For bilateral trades done through PJM, the FTR transmission path must remain the same, FTR obligations must remain obligations, and FTR options must remain options. However, an individual FTR may be split up into multiple, smaller FTRs, down to increments of 0.1 MW. FTRs can also be given different start and end times, but the start time cannot be earlier than the original FTR start time and the end time cannot be later than the original FTR end time.

Buy Bids

In the 2012 to 2015 Long Term FTR Auction, total FTR buy bids increased 1.3 percent from 400,222 MW to 405,504 MW. In the Annual FTR Auction total FTR buy bids and self scheduled bids increased 84.8 percent from 1,764,288 MW to 3,260,695 MW. The total FTR buy bids from the Monthly Balance of Planning Period FTR Auctions for the first seven months of the 2011 to 2012 planning period increased 42.3 percent from 8,973,645 MW, during the same time period of the prior planning period, to 12,767,075 MW.

Limits on Number of Bids

The PJM tariff specifies that PJM has the authority to limit the maximum number of FTR bids to 5,000 per participant for a monthly auction, or a single round of an annual auction, if necessary to avoid system performance issues.²⁰ PJM has previously limited the maximum number of bids per participant to 20,000 bids. Effective with the September 2011 Monthly Balance of Planning Period FTR Auction, PJM reduced the maximum number of bids per participant to 10,000 bids for any FTR auction. For example, a participant in the September 2011 Monthly Balance of Planning Period FTR Auction could place 10,000 bids for each of the six periods of September, October, November, Q2, Q3 and Q4 for a total of 60,000 bids. PJM indicated that this reduction was required for reasons of system performance.²¹ This rule change affected only a small number of participants. The number of unique participants in the Annual FTR Auction has increased

²⁰ OA Schedule 1 § 7.3.5(d).

²¹ See Messages section in eFTR within the PJM eSuite application <<https://esuite.pjm.com/mui/>> (Accessed November 4, 2011).

¹⁹ See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 39.

from 74, in the 2003 to 2004 planning period, to 272 in the 2011 to 2012 planning period, and the average MW bid has decreased from its peak of 29 MW per participant in the 2004 to 2005 planning period to 14 MW per bid in the 2011 to 2012 planning period.

Credit Issues

Default

There were eight participants that defaulted during the 2011 calendar year and 12 default events. The average default for the 2011 calendar year was \$282,721 with a maximum default of \$2.55 million. Of all the defaults eight were based on collateral and four were based on payments. Six of the eight defaulting participants were financial companies. All of the credit defaults were promptly cured in the 2011 calendar year.²² These defaults were not related to FTR positions.

Credit Rules

Following a series of high profile defaults, PJM made significant reforms to its credit policies in 2007–2009.²³ On September 15, 2011, the FERC conditionally approved PJM's proposed revisions to its credit policy filed in compliance with FERC's Order No. 741, which required tighter credit standards for all RTOs.²⁴ The FERC determined that PJM was already compliant in a number of respects, and, effective October 1, 2011, permitted PJM to implement the following changes: the maximum aggregate unsecured limit for affiliated groups was reduced to \$50 million from \$150 million; minimum financial criteria for participation in PJM market; and PJM is now required to explain in writing application of its Material Adverse Change provisions.²⁵

On November 29, 2011, PJM submitted in compliance with the September 15th Order revisions (i) verifying compliance with minimum criteria for market participation (ii) modifying the officer certification form to clarify attestations about the nature of the participant's trading activity and (iii) eliminating reliance on seller credit in FTR markets (and capping seller credit for other

purposes).²⁶ The filing also revised the Certification Form to indicate that the signatory acknowledges that the information provided in the certificate is true and accurate to the best of the signatory's belief and knowledge after due investigation.²⁷

PJM requested an effective date of December 13, 2011. Approval of the compliance filing, and requests for rehearing of the September 15th Order, are now pending at the FERC. The elimination of seller credit from FTR markets, which would eliminate reliance on unsecured credit consistent with the recommendation included in prior state of the market reports, is among the issues pending on rehearing.²⁸

PJM stated that it will require submittal of officer certification forms and risk management procedures during the first four months of 2012.²⁹

Smaller financial traders had asserted that the new requirements may exclude them from the markets and negatively impact liquidity.³⁰ As a result of these new requirements, most PJM members complied with PJM's new minimum financial requirements effective October 1, 2011. Based on submitted information, 17 members did not meet the new requirements. Of these 17, 16 opted to reduce or discontinue their transaction activity and one did not comply, and was declared in default. These 17 members accounted for 0.1 percent of the aggregate bids in the 2011 to 2012 Annual FTR auction.³¹

Patterns of Ownership

The overall ownership structure of FTRs and the ownership of prevailing flow and counter flow FTRs is descriptive and is not necessarily a measure of actual or potential FTR market structure issues, as the ownership positions result from competitive auctions. The percentage of FTR ownership shares may change when FTR owners buy or sell FTRs in the Monthly Balance of Planning Period FTR Auctions or secondary bilateral market.

²² Email to Members Committee, "PJM Settlement Member Credit Exposure – End of December 2011," January 12, 2012.

²³ See 127 FERC ¶ 61,017 (2009).

²⁴ *PJM Interconnection, L.L.C.*, 136 FERC ¶61,190 (September 15th Order); see also *Credit Reforms in Organized Wholesale Electric Markets*, Order No. 741, FERC Stats. & Regs. ¶31,317 (2010), *order on reh'g*, Order No. 741-A, FERC Stats. & Regs. ¶31,320, *reh'g denied*, Order No. 741-B, 135 FERC ¶61,242 (2011).

²⁵ *Id.*

²⁶ Transmittal Letter for Compliance Filing of PJM in Docket No. ER11-3972-002 at 4.

²⁷ *Id.*

²⁸ See, e.g., Request for Rehearing, Clarification, and Technical Conference of Electric Power Supply Association filed in Docket No. ER11-3972-001 (October 17, 2011).

²⁹ Email from Suzanne Daugherty, PJM Vice President and CFO to Members, "Summary of FERC Order on PJM's Credit Order 741 Compliance Filing" (September 16, 2011) ("PJM Email Summary").

³⁰ See FERC Docket No. ER11-3972.

³¹ It is not possible to evaluate the impact on members which members did not report.

The ownership concentration of cleared FTR buy bids resulting from the 2011 to 2012 Annual FTR Auction was low to moderate for FTR obligations and high for FTR options.

For cleared FTR buy-bid obligations in the 2011 to 2012 Annual FTR Auction, the HHIs were 1036 for 24-hour, 549 for on peak and 655 for off peak FTR products while maximum market shares were 16.6 percent for 24-hour, which is associated with a physical entity, 11.4 percent for on peak, which is associated with a financial entity, and 11.4 percent for off peak FTR products, which is associated with a financial entity.

For cleared FTR buy-bid options in the 2011 to 2012 Annual FTR Auction, HHIs were 4542 for 24-hour, 824 for on peak and 886 for off peak products while maximum market shares were 62.9 percent for 24-hour, which is associated with a physical entity, 16.4 percent for on peak, which is associated with a financial entity, and 14.7 percent for off peak FTR products, which is associated with a financial entity.

In order to evaluate the ownership of prevailing flow and counter flow FTRs, the MMU categorized all participants owning FTRs in PJM as either physical or financial. Physical entities include utilities and customers which primarily take physical positions in PJM markets. Financial entities include banks and hedge funds which primarily take financial positions in PJM markets. International market participants that primarily take financial positions in PJM markets are generally considered to be financial entities even if they are utilities in their own countries.

Table 12-4 presents the 2012 to 2015 Long Term FTR Auction market cleared FTRs by trade type, organization type and FTR direction. The results show that financial entities own 89.9 percent of prevailing flow cleared buy bid FTRs and 94.2 percent of counter flow cleared buy bid FTRs. Overall, financial entities own about 91.8 percent of all Long Term Auction cleared buy bid FTRs.

Table 12-4 Long Term FTR Auction patterns of ownership by FTR direction: Planning periods 2012 to 2015³²

Trade Type	Organization Type	FTR Direction		All
		Prevailing Flow	Counter Flow	
Buy Bids	Physical	10.2%	5.8%	8.2%
	Financial	89.8%	94.2%	91.8%
	Total	100.0%	100.0%	100.0%
Sell Offers	Physical	7.9%	5.4%	7.3%
	Financial	92.1%	94.6%	92.7%
	Total	100.0%	100.0%	100.0%

Table 12-5 presents the Annual FTR Auction market cleared FTRs in the 2011 to 2012 planning period by trade type, organization type and FTR direction, including self scheduled FTRs. The results show that physical entities own 43.9 percent of prevailing flow cleared buy bid FTRs while financial entities own 84.8 percent of counter flow cleared buy bid FTRs. In the 2011 to 2012 Annual FTR Auction physical entities own 9.5 percent of all sold FTRs while financial entities own 90.5 percent of all sold FTRs.

Table 12-5 Annual FTR Auction patterns of ownership by FTR direction: Planning period 2011 to 2012

Trade Type	Organization Type	Self-Scheduled FTRs	FTR Direction		All
			Prevailing Flow	Counter Flow	
Buy Bids	Physical	Yes	17.2%	1.0%	11.9%
		No	26.7%	14.2%	22.6%
		Total	43.9%	15.2%	34.4%
	Financial	No	56.1%	84.8%	65.6%
		Total	100.0%	100.0%	100.0%
		Sell Offers	Physical	9.5%	9.8%
	Financial		90.5%	90.2%	90.5%
	Total		100.0%	100.0%	100.0%

Table 12-6 presents the Monthly Balance of Planning Period FTR Auction market cleared FTRs in calendar year 2011 by trade type, organization type and FTR direction. The results show that physical entities own only 9.9 percent of counter flow cleared buy bid FTRs while financial entities own 90.1 percent. Overall, financial entities own 86.7 percent of all Monthly Balance of Planning Period cleared buy bid FTRs.

³² Table 12-4, Table 12-5 and Table 12-6 are updated from 2009 State of the Market Report to include trade type. Previous versions of these tables netted the buy and sell MW by FTR and organization. This created organizations with FTRs that had a net negative MW volume in the respective auction.

Table 12-6 Monthly Balance of Planning Period FTR Auction patterns of ownership by FTR direction: Calendar year 2011

Trade Type	Organization Type	FTR Direction		All
		Prevailing Flow	Counter Flow	
Buy Bids	Physical	16.7%	9.9%	13.3%
	Financial	83.3%	90.1%	86.7%
	Total	100.0%	100.0%	100.0%
Sell Offers	Physical	28.8%	12.3%	24.8%
	Financial	71.2%	87.7%	75.2%
	Total	100.0%	100.0%	100.0%

Table 12-7 presents the daily FTR net position ownership in 2011 by FTR direction. To determine the daily FTR net position for an organization, the net position of all FTRs, including all auctions, is calculated for every organization each day. An organization's net daily position is the difference between all FTR buys and FTR sells from all relevant auctions and bilateral trades for each day. The net position of all FTRs, including all auctions, is calculated for every organization each day. The data is summarized for the 2011 calendar year to show the ownership patterns by FTR direction. Physical entities owned 40.4 percent of all prevailing flow FTRs and 22.2 percent of counter flow FTRs in 2011.

Table 12-7 Daily FTR net position ownership by FTR direction: Calendar year 2011

Organization Type	FTR Direction		All
	Prevailing Flow	Counter Flow	
Physical	40.4%	22.2%	35.4%
Financial	59.6%	77.8%	64.6%
Total	100.0%	100.0%	100.0%

Market Performance

Volume

Table 12-8 shows the 2012 to 2015 Long Term FTR Auction volume by trade type, FTR direction and period type.³³ The total volume was 2,400,881 MW for FTR buy bids and 251,290 MW for FTR sell offers in the 2012 to 2015 Long Term FTR Auction. This is up from the total volume of 1,996,084 MW for FTR buy bids and 117,540 MW for FTR sell offers in the 2011 to 2014 Long Term FTR Auction.

The 2012 to 2015 Long Term FTR Auction cleared 259,885 MW (10.8 percent of demand) of FTR buy bids, compared to 238,681 MW (12.0 percent) in the 2011 to 2014 Long Term FTR Auction. The 2012 to 2015 Long Term FTR Auction also cleared 31,288 MW (12.5 percent) of FTR sell offers, up from 12,501 MW (7.0 percent) in the 2011 to 2012 Long Term FTR Auction.

The volume of buy bids for the period covering all three years of the Long Term Auction was only 830 MW, with none clearing the auction.

In the 2012 to 2015 Long Term FTR Auction, there were 123,381 MW (30.8 percent) cleared counter flow FTR buy bids and 136,504 MW (6.8 percent) cleared prevailing flow FTR buy bids. In the 2012 to 2015 Long Term FTR Auction, there were 6,746 MW (8.2 percent) cleared counter flow FTR sell offers and 24,543 MW (14.6 percent) cleared prevailing flow FTR sell offers.

Table 12-9 shows the Annual FTR Auction volume by trade type, hedge type and FTR direction for the 2011 to 2012 planning period. The total volume was 3,214,678 MW for FTR buy bids and 337,510 MW for FTR sell offers for the 2011 to 2012 planning period. This is up from the total volume of 1,708,556 MW for FTR buy bids and up from 178,428 MW for FTR sell offers for the 2010 to 2011 planning period.

There were 341,726 MW (10.6 percent) of cleared FTR buy bids and 24,960 MW (7.4 percent) of cleared FTR sell offers for the 2011 to 2012 planning period. This is up from the total of 231,663 MW (13.6 percent) of cleared FTR buy bids and up from 10,315 MW (5.8 percent) of cleared FTR sell offers for the 2010 to 2011 planning period.

For the 2011 to 2012 planning period, there were 126,654 MW (30.3 percent) counter flow FTR buy bids and 215,071 MW (7.7 percent) cleared prevailing flow FTR buy bids. During the 2011 to 2012 planning period, there were 4,676 MW (3.6 percent) cleared counter flow FTR sell offers and 20,284 MW (9.8 percent) cleared prevailing flow FTR offers.

³³ Calculated values shown in Section 12, "Financial Transmission and Auction Revenue Rights," are based on unrounded, underlying data and may differ from calculations based on the rounded values in the tables.

Table 12-8 Long Term FTR Auction market volume: Planning periods 2012 to 2015

Trade Type	FTR Direction	Period Type	Bid and Requested Count	Bid and Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
Buy bids	Counter Flow	Year 1	35,974	148,674	45,589	30.7%	103,085	69.3%
		Year 2	26,884	124,784	37,622	30.2%	87,162	69.8%
		Year 3	26,605	127,166	40,169	31.6%	86,997	68.4%
		Year All	12	384	0	0.0%	384	100.0%
		Total	89,475	401,008	123,381	30.8%	277,628	69.2%
	Prevailing Flow	Year 1	129,341	773,818	53,934	7.0%	719,884	93.0%
		Year 2	98,027	623,153	41,074	6.6%	582,079	93.4%
		Year 3	88,639	602,455	41,497	6.9%	560,959	93.1%
		Year All	22	446	0	0.0%	446	100.0%
		Total	316,029	1,999,873	136,504	6.8%	1,863,368	93.2%
Total		405,504	2,400,881	259,885	10.8%	2,140,996	89.2%	
Sell offers	Counter Flow	Year 1	13,034	44,098	3,088	7.0%	41,010	93.0%
		Year 2	8,441	28,365	2,502	8.8%	25,863	91.2%
		Year 3	2,595	10,265	1,155	11.2%	9,111	88.8%
		Year All	NA	NA	NA	NA	NA	NA
		Total	24,070	82,729	6,746	8.2%	75,983	91.8%
	Prevailing Flow	Year 1	21,009	86,831	14,079	16.2%	72,752	83.8%
		Year 2	15,598	67,105	8,745	13.0%	58,360	87.0%
		Year 3	4,178	14,625	1,718	11.7%	12,907	88.3%
		Year All	NA	NA	NA	NA	NA	NA
		Total	40,785	168,561	24,543	14.6%	144,019	85.4%
Total		64,855	251,290	31,288	12.5%	220,002	87.5%	

Table 12-9 Annual FTR Auction market volume: Planning period 2011 to 2012

Trade Type	Hedge Type	FTR Direction	Bid and Requested Count	Bid and Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
Buy bids	Obligations	Counter Flow	92,575	401,779	116,108	28.9%	285,671	71.1%
		Prevailing Flow	282,198	1,688,422	176,164	10.4%	1,512,258	89.6%
		Total	374,773	2,090,201	292,273	14.0%	1,797,928	86.0%
	Options	Counter Flow	194	15,546	10,546	67.8%	5,000	32.2%
		Prevailing Flow	30,420	1,108,931	38,907	3.5%	1,070,024	96.5%
		Total	30,614	1,124,477	49,453	4.4%	1,075,024	95.6%
	Total	Counter Flow	92,769	417,325	126,654	30.3%	290,671	69.7%
		Prevailing Flow	312,618	2,797,353	215,071	7.7%	2,582,282	92.3%
		Total	405,387	3,214,678	341,726	10.6%	2,872,952	89.4%
	Self-scheduled bids	Obligations	Counter Flow	249	1,278	1,278	100.0%	0
Prevailing Flow			10,163	44,739	44,739	100.0%	0	0.0%
Total			10,412	46,017	46,017	100.0%	0	0.0%
Buy and self-scheduled bids	Obligations	Counter Flow	92,824	403,057	117,386	29.1%	285,671	70.9%
		Prevailing Flow	292,361	1,733,161	220,903	12.7%	1,512,258	87.3%
		Total	385,185	2,136,218	338,290	15.8%	1,797,928	84.2%
	Options	Counter Flow	194	15,546	10,546	67.8%	5,000	32.2%
		Prevailing Flow	30,420	1,108,931	38,907	3.5%	1,070,024	96.5%
		Total	30,614	1,124,477	49,453	4.4%	1,075,024	95.6%
	Total	Counter Flow	93,018	418,603	127,932	30.6%	290,671	69.4%
		Prevailing Flow	322,781	2,842,092	259,810	9.1%	2,582,282	90.9%
		Total	415,799	3,260,695	387,743	11.9%	2,872,952	88.1%
	Sell offers	Obligations	Counter Flow	29,939	123,127	4,676	3.8%	118,451
Prevailing Flow			46,211	196,244	20,118	10.3%	176,126	89.7%
Total			76,150	319,371	24,794	7.8%	294,577	92.2%
Options		Counter Flow	40	7,820	0	0.0%	7,820	100.0%
		Prevailing Flow	783	10,319	166	1.6%	10,153	98.4%
		Total	823	18,139	166	0.9%	17,973	99.1%
Total		Counter Flow	29,979	130,947	4,676	3.6%	126,271	96.4%
		Prevailing Flow	46,994	206,562	20,284	9.8%	186,279	90.2%
		Total	76,973	337,510	24,960	7.4%	312,550	92.6%

Table 12-10 shows that for the 2011 to 2012 planning period, eligible market participants self scheduled 46,017 MW of ARRs out of a possible 103,735 MW as Annual FTRs. In comparison, during the 2010 to 2011 planning period, eligible market participants self scheduled 55,732 MW of ARRs out of a possible 102,046 MW.

Table 12-10 Comparison of self scheduled FTRs: Planning periods 2009 to 2010, 2010 to 2011 and 2011 to 2012³⁴

Planning Period	Self-Scheduled FTRs (MW)	Maximum Possible Self-Scheduled FTRs (MW)	Percent of ARRs Self-Scheduled as FTRs
2009/2010	68,589	109,612	62.6%
2010/2011	55,732	102,046	54.6%
2011/2012	46,017	103,735	44.4%

Table 12-11 shows that there were 10,999,601 MW of FTR buy bid obligations and 3,504,363 MW of FTR sell offer obligations for all bidding periods in the Monthly Balance of Planning Period FTR Auctions for the 2011 to 2012 planning period through December 31, 2011. The monthly auctions cleared 1,543,888 MW (14.0 percent) of FTR buy bid obligations and 314,027 MW (9.0 percent) of cleared FTR sell offer obligations.

There were 1,767,474 MW of FTR buy bid options and 480,419 MW of FTR sell offer options for all bidding periods in the Monthly Balance of Planning Period FTR Auctions for the 2011 to 2012 planning period through December 31, 2011. The monthly auctions cleared 46,102 MW (2.6 percent) of FTR buy bid options. There were 113,416 MW (23.6 percent) of cleared FTR sell offer options.

The Monthly Balance of Planning Period FTR Auctions for the full 12-month 2010 to 2011 planning period had a total demand of 14,291,535 MW for FTR buy bids, up from 8,219,996 MW for the 12-month 2009 to 2010 planning period, and 4,017,267 MW for FTR sell offers, up from 2,795,964 MW for the 12-month 2009 to 2010 planning period. The monthly auctions cleared 2,043,159 MW (14.3 percent) of FTR buy bids and 458,938 MW (11.4 percent) of FTR sell offers. Of the cleared buy bids for the 2010 to 2011 planning period, 1,975,624 MW (96.7 percent) were obligations. For cleared sell offers in the 2010 to 2011 planning period, 311,688 MW (67.9 percent) were obligations.

³⁴ The column Maximum Possible Self-Scheduled FTRs in Table 12-4 is updated from the 2009 State of the Market Report to include RTEP IARR MW. RTEP IARRs and ARRs can be self-scheduled in round 1 of the Annual FTR Auction.

Table 12-12 shows the bid and cleared volume for FTR buy bids in the Monthly Balance of Planning Period FTR Auctions by bidding period for January 2011 through December 2011.

Figure 12-2 shows the cleared volume of buy and sell bids for each FTR Auction type as a percentage of total FTR volume in a calendar month. Annual and Long Term FTR Auctions contribute a constant volume for the planning period to each calendar month's total volume for their respective planning periods. Long Term FTR Auctions are broken into the appropriate planning periods depending on the period indicated in the bid. For example, a bid for the second year in the 2009 to 2013 Long Term FTR Auction applies only to each calendar month in the 2010 to 2011 planning period. Figure 12-2 shows that the cleared volume in the Annual FTR Auction has been steadily decreasing while the cleared volume from the Monthly Balance of Planning Period Auctions has been increasing.

Figure 12-2 Cleared auction volume (MW) as a percent of total FTR cleared volume by calendar month: June 2004 through December 2011

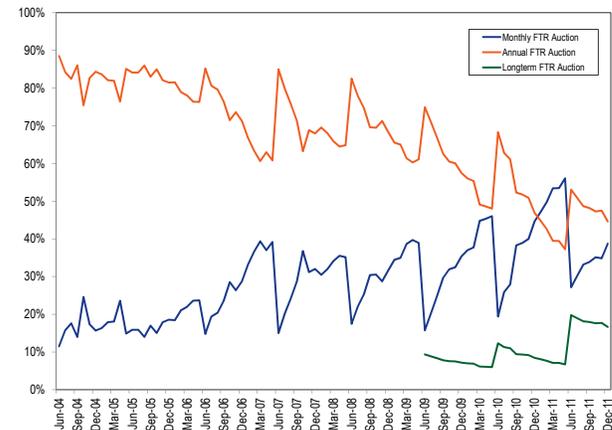


Table 12-13 shows the PJM secondary bilateral FTR market volume by hedge type and class type for the 2010 to 2011 and the 2011 to 2012 planning periods. There were 22,611 MW of total bilateral FTR activity for the 2011 to 2012 planning period through December 31, 2011, while there were 24,054 MW during the 2010 to 2011 planning period. Price data is not meaningful as PJM market participants enter zero as the price for more than 63 percent of secondary bilateral FTR transactions.

Table 12-11 Monthly Balance of Planning Period FTR Auction market volume: Calendar year 2011

Monthly Auction	Hedge Type	Trade Type	Bid and Requested Count	Bid and Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
Jan-11	Obligations	Buy bids	189,084	1,101,808	164,743	15.0%	937,065	85.0%
		Sell offers	50,981	261,888	28,189	10.8%	233,699	89.2%
	Options	Buy bids	1,040	105,293	8,691	8.3%	96,602	91.7%
		Sell offers	2,927	43,161	12,380	28.7%	30,781	71.3%
Feb-11	Obligations	Buy bids	185,625	1,090,475	181,977	16.7%	908,497	83.3%
		Sell offers	41,609	220,079	20,957	9.5%	199,122	90.5%
	Options	Buy bids	959	93,909	9,372	10.0%	84,537	90.0%
		Sell offers	2,555	33,140	9,643	29.1%	23,497	70.9%
Mar-11	Obligations	Buy bids	192,349	1,154,132	216,165	18.7%	937,967	81.3%
		Sell offers	48,727	256,121	30,492	11.9%	225,629	88.1%
	Options	Buy bids	1,026	96,152	7,254	7.5%	88,898	92.5%
		Sell offers	2,351	41,200	10,587	25.7%	30,613	74.3%
Apr-11	Obligations	Buy bids	149,735	847,575	164,278	19.4%	683,297	80.6%
		Sell offers	37,737	220,966	22,108	10.0%	198,858	90.0%
	Options	Buy bids	919	66,008	5,387	8.2%	60,621	91.8%
		Sell offers	1,834	32,136	9,327	29.0%	22,810	71.0%
May-11	Obligations	Buy bids	138,353	741,926	189,851	25.6%	552,075	74.4%
		Sell offers	27,642	122,217	13,661	11.2%	108,556	88.8%
	Options	Buy bids	759	20,612	2,485	12.1%	18,127	87.9%
		Sell offers	1,184	19,631	9,065	46.2%	10,566	53.8%
Jun-11	Obligations	Buy bids	332,116	1,924,420	312,144	16.2%	1,612,276	83.8%
		Sell offers	135,073	585,528	40,839	7.0%	544,689	93.0%
	Options	Buy bids	7,625	256,153	11,013	4.3%	245,140	95.7%
		Sell offers	18,794	103,002	24,097	23.4%	78,904	76.6%
Jul-11	Obligations	Buy bids	343,986	2,085,575	286,143	13.7%	1,799,432	86.3%
		Sell offers	124,629	554,483	37,933	6.8%	516,549	93.2%
	Options	Buy bids	3,239	147,732	13,337	9.0%	134,395	91.0%
		Sell offers	12,897	76,029	20,259	26.6%	55,770	73.4%
Aug-11	Obligations	Buy bids	310,562	1,830,992	252,468	13.8%	1,578,524	86.2%
		Sell offers	117,597	529,879	40,335	7.6%	489,545	92.4%
	Options	Buy bids	3,070	150,896	6,736	4.5%	144,160	95.5%
		Sell offers	10,680	66,968	14,427	21.5%	52,541	78.5%
Sep-11	Obligations	Buy bids	255,744	1,352,484	180,231	13.3%	1,172,252	86.7%
		Sell offers	111,846	538,916	54,686	10.1%	484,230	89.9%
	Options	Buy bids	3,368	228,757	4,942	2.2%	223,815	97.8%
		Sell offers	10,816	73,140	17,741	24.3%	55,399	75.7%
Oct-11	Obligations	Buy bids	277,059	1,492,587	188,474	12.6%	1,304,113	87.4%
		Sell offers	91,184	430,188	46,727	10.9%	383,461	89.1%
	Options	Buy bids	3,342	416,369	4,336	1.0%	412,033	99.0%
		Sell offers	9,610	54,706	11,430	20.9%	43,276	79.1%
Nov-11	Obligations	Buy bids	245,707	1,254,959	170,134	13.6%	1,084,825	86.4%
		Sell offers	86,993	414,939	43,839	10.6%	371,101	89.4%
	Options	Buy bids	2,963	307,806	3,325	1.1%	304,481	98.9%
		Sell offers	7,571	49,692	11,915	24.0%	37,777	76.0%
Dec-11	Obligations	Buy bids	200,071	1,058,585	154,294	14.6%	904,292	85.4%
		Sell offers	94,062	450,429	49,668	11.0%	400,762	89.0%
	Options	Buy bids	3,401	259,762	2,413	0.9%	257,349	99.1%
		Sell offers	6,760	56,882	13,547	23.8%	43,335	76.2%
2010/2011*	Obligations	Buy bids	2,378,154	12,888,263	1,975,624	15.3%	10,912,639	84.7%
		Sell offers	709,605	3,448,995	311,688	9.0%	3,137,308	91.0%
	Options	Buy bids	16,090	1,403,272	67,536	4.8%	1,335,736	95.2%
		Sell offers	60,091	568,271	147,251	25.9%	421,021	74.1%
2011/2012**	Obligations	Buy bids	1,965,245	10,999,601	1,543,888	14.0%	9,455,713	86.0%
		Sell offers	761,384	3,504,363	314,027	9.0%	3,190,336	91.0%
	Options	Buy bids	27,008	1,767,474	46,102	2.6%	1,721,372	97.4%
		Sell offers	77,128	480,419	113,416	23.6%	367,003	76.4%

* Shows Twelve Months for 2010/2011; ** Shows seven months ended 31-Dec-2011 for 2011/2012

Table 12-12 Monthly Balance of Planning Period FTR Auction buy-bid bid and cleared volume (MW per period): Calendar year 2011

Monthly Auction	MW Type	Current Month	Second Month	Third Month	Q1	Q2	Q3	Q4	Total
Jan-11	Bid	677,552	197,260	140,265				192,024	1,207,101
	Cleared	134,232	18,200	8,548				12,454	173,434
Feb-11	Bid	705,015	157,482	139,776				182,111	1,184,383
	Cleared	156,562	11,243	11,107				12,438	191,350
Mar-11	Bid	774,291	206,225	205,539				64,228	1,250,283
	Cleared	173,607	22,830	20,602				6,380	223,419
Apr-11	Bid	698,577	215,007						913,583
	Cleared	153,834	15,832						169,666
May-11	Bid	762,538							762,538
	Cleared	192,336							192,336
Jun-11	Bid	893,961	247,465	245,244	87,002	241,008	219,128	246,765	2,180,573
	Cleared	176,087	28,040	27,497	10,733	28,673	26,805	25,321	323,157
Jul-11	Bid	924,620	300,178	148,980		293,107	287,862	278,560	2,233,307
	Cleared	171,384	28,868	14,197		27,365	31,676	25,990	299,480
Aug-11	Bid	892,507	181,881	169,691		238,458	248,517	250,833	1,981,888
	Cleared	168,550	16,915	15,175		15,479	20,858	22,227	259,204
Sep-11	Bid	743,395	186,272	182,067		49,451	206,242	213,814	1,581,240
	Cleared	120,684	16,207	15,317		3,983	14,362	14,621	185,173
Oct-11	Bid	862,809	266,426	252,455			256,279	270,987	1,908,956
	Cleared	127,312	19,605	13,087			15,121	17,684	192,810
Nov-11	Bid	670,097	236,522	210,716			202,931	242,498	1,562,764
	Cleared	114,996	16,860	14,371			10,256	16,977	173,459
Dec-11	Bid	611,433	237,942	222,675			24,799	221,498	1,318,347
	Cleared	116,390	14,930	13,254			1,637	10,495	156,707

Table 12-13 Secondary bilateral FTR market volume: Planning periods 2010 to 2011 and 2011 to 2012³⁵

Planning Period	Hedge Type	Class Type	Volume (MW)
2010/2011	Obligation	24-Hour	1,687
		On Peak	10,035
		Off Peak	12,313
		Total	24,034
	Option	24-Hour	20
2011/2012*	Obligation	24-Hour	206
		On Peak	11,857
		Off Peak	4,218
		Total	16,281
	Option	24-Hour	0
	Option	On Peak	8,965
		Off Peak	6,330
		Total	15,296

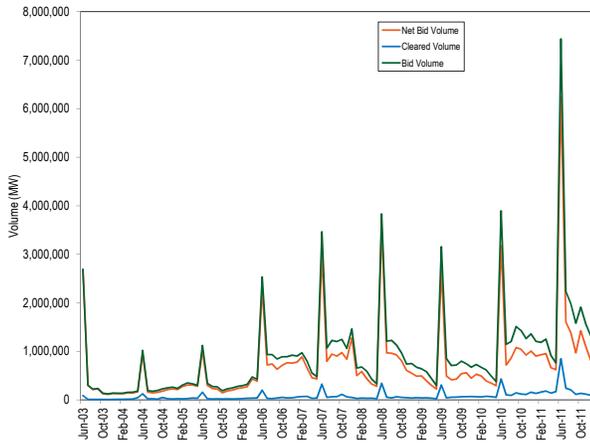
* Shows seven months ended 31-Dec-2011

Figure 12-3 shows the historic FTR bid, cleared and net bid volume from June 2003 through December 2011 for Long Term, Annual and Monthly Balance of Planning Period Auctions. Cleared volume represents the volume of FTRs buy and sell offers that were accepted. The net bid volume includes the total buy, sell and self-

scheduled offers in a given auction, counting sell offers as a negative volume. The bid volume is the total of all bid and self-scheduled offers in a given auction whether or not they cleared, excluding sell offers. The maximum bid, cleared and net bid volumes of 6,233,773 MW, 847,183 MW and 7,437,352 MW are all in June 2011. The periodic spikes represent the Long Term and Annual Auctions, which are included in the June volume at the start of each planning period in which the bids cleared. In the case of the Long Term FTR Auctions the volume is included in June of the planning period in which the first year of the FTR may take effect. For example, the 2009 to 2012 Long Term Auction is included in June 2009. The cleared volume has trended upward, consistent with transmission additions and upgrades. There is also a trend, starting in the 2007 to 2008 planning period, of the bid volume decreasing as the planning period progresses, followed by a large increase in bids in the auctions for the new planning period. The 2011 to 2012 planning period had a very large bid volume compared to prior planning periods.

³⁵ The 2011 to 2012 planning period covers bilateral FTRs that are effective for any time between June 1, 2011 through December 31, 2011, which originally had been purchased in a Long Term FTR Auction, Annual FTR Auction or Monthly Balance of Planning Period FTR Auction.

Figure 12-3 Long Term, Annual and Monthly FTR Auction bid and cleared volume: June 2003 through December 2011³⁶



Price

The least expensive way to purchase an FTR is in the Monthly Balance of Planning Period Auctions. Within the Monthly Balance of Planning Period Auctions, it is least expensive to purchase an FTR for the shoulder months. The average price of an FTR during the Monthly Balance of Planning Period Auctions is \$0.12, with May 2011 being the least expensive month at \$0.06. The least expensive month and period is a bid cleared in the January 2011 auction which would cover March 2011, at \$0.02.

Table 12-14 shows the cleared, weighted-average prices by trade type, FTR direction, period type and class type for the 2012 to 2015 Long Term FTR Auction. Only FTR obligation products are available in Long Term FTR Auctions. In this auction, weighted-average, buy-bid FTR prices were \$0.05 per MW while weighted-average sell offer FTR prices were \$0.24 per MW. Comparable weighted-average, buy-bid FTR prices were \$0.06 per MW while weighted-average sell offer FTR prices were \$0.10 per MW in the 2011 to 2014 Long Term FTR Auction.

Table 12-14 Long Term FTR Auction weighted-average cleared prices (Dollars per MW): Planning periods 2012 to 2015

Trade Type	FTR Direction	Period Type	Class Type			
			24-Hour	On Peak	Off Peak	All
Buy bids	Counter Flow	Year 1	(\$1.66)	(\$0.21)	(\$0.29)	(\$0.29)
		Year 2	(\$1.73)	(\$0.19)	(\$0.23)	(\$0.24)
		Year 3	(\$0.50)	(\$0.15)	(\$0.20)	(\$0.18)
		Year All	NA	NA	NA	NA
		Total	(\$1.43)	(\$0.18)	(\$0.24)	(\$0.24)
Prevaling Flow		Year 1	\$0.99	\$0.24	\$0.37	\$0.33
		Year 2	\$1.14	\$0.21	\$0.33	\$0.31
		Year 3	\$0.94	\$0.18	\$0.28	\$0.25
		Year All	NA	NA	NA	NA
		Total	\$1.03	\$0.21	\$0.33	\$0.30
Total			\$0.36	\$0.02	\$0.05	\$0.05
Sell offers	Counter Flow	Year 1	(\$0.56)	(\$0.32)	(\$0.54)	(\$0.44)
		Year 2	(\$0.56)	(\$0.19)	(\$0.65)	(\$0.37)
		Year 3	NA	(\$0.10)	(\$0.11)	(\$0.11)
		Year All	NA	NA	NA	NA
		Total	(\$0.56)	(\$0.23)	(\$0.48)	(\$0.36)
Prevaling Flow		Year 1	\$0.92	\$0.23	\$0.54	\$0.38
		Year 2	\$1.44	\$0.30	\$0.64	\$0.48
		Year 3	\$0.29	\$0.20	\$0.32	\$0.26
		Year All	NA	NA	NA	NA
		Total	\$1.13	\$0.25	\$0.56	\$0.41
Total			\$0.57	\$0.15	\$0.33	\$0.24

The 2012 to 2015 Long Term FTR Auction price frequency for cleared buy bids in Figure 12-5 shows that 96.5 percent of Long Term FTRs were purchased for less than \$1 per MW. Negative prices occur because some FTRs are bid with negative prices and some winning FTR bidders are paid to take FTRs (counter flow FTRs). For the 2012 to 2015 Long Term FTR Auction, 99.9 percent of buy bids cleared between -\$2 per MW and \$2 per MW, with 19.9 percent of all buy bids clearing for \$0 per MW.

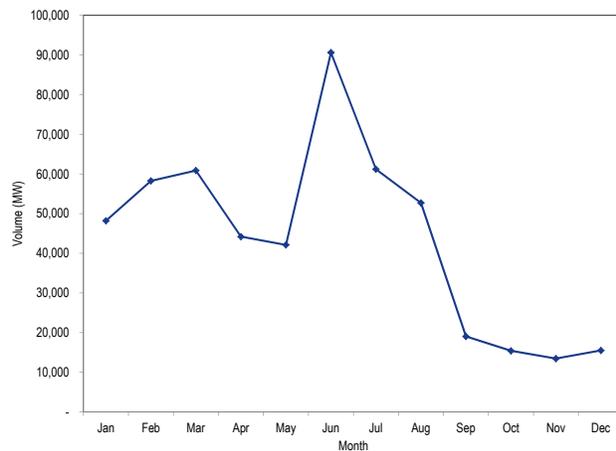
On October 31, 2011 the FERC issued an order accepting revisions to the PJM OATT with an effective date of August 5, 2011. As of that date, PJM no longer allows buy bids to clear with a price of \$0 unless “there is a minimum of one binding constraint in the auction period for which the Financial Transmission Rights path sensitivity is non-zero.”³⁷ The September 2011 Monthly Balance of Planning Period FTR Auction was the first auction affected by this rule change. The average volume of FTR MW cleared at a price of zero dropped 72.3 percent from the January 2011 through August 2011 Monthly Balance of Planning Period Auctions, to the September 2011 through December 2011 Monthly

³⁶ The previous 3rd Quarter State of the Market Report did not contain volume data for Long Term FTR Auctions.

³⁷ 137 FERC ¶ 61,003 (2011).

Balance of Planning Period auctions. Figure 12-4 shows the volume of FTR buy bids that cleared with a price of \$0 for the 2011 calendar year. The September 2011 Monthly Balance of Planning Period FTR Auction was the first to be affected by the zero bid rule change. Cleared bids at \$0 declined substantially from August to September and subsequent auctions.

Figure 12-4 Volume of FTR buy bids cleared at \$0: Calendar year 2011



The 2012 to 2015 Long Term FTR Auction price frequency for cleared buy bids in Figure 12-5 shows that 96.3 percent of Long Term FTRs were purchased for less than \$1 per MW. Negative prices occur because some FTRs are bid with negative prices and some winning FTR bidders are paid to take FTRs (counter flow FTRs). The majority of the cleared bids for the 2012 to 2015 Long Term FTR Auction fall into the \$0 to \$2 range. This auction was conducted prior to the new \$0 bid rule implementation.

Figure 12-5 Long Term FTR auction clearing price per MW frequency: Planning periods 2012 to 2015

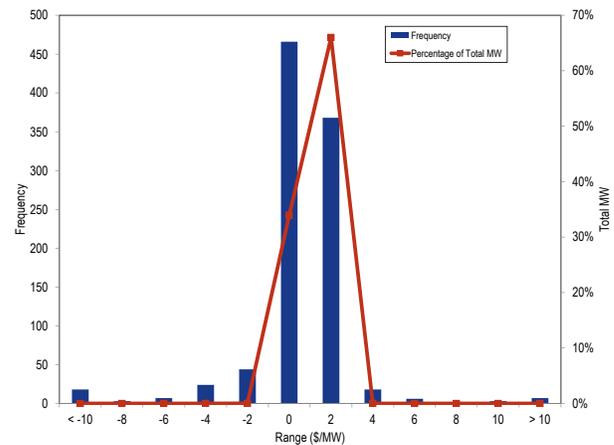


Table 12-15 shows the cleared, weighted-average prices by trade type, hedge type, FTR direction and class type for Annual FTRs during the 2011 to 2012 planning period. For the 2011 to 2012 planning period, weighted-average, buy-bid FTR obligation prices were \$0.06 per MW higher than the previous planning period, while weighted-average, buy-bid FTR option prices were \$0.10 per MW lower. During the 2011 to 2012 planning period, weighted-average sell offer FTR obligation and option prices were \$0.12 and \$0.09 per MW higher than the previous planning period.

On average during the 2011 to 2012 planning period in the Annual FTR Auction, self scheduled FTRs were priced \$0.75 per MW higher than buy-bid obligation FTRs. They were priced \$0.25 per MW less than the cleared, weighted-average price of self scheduled FTRs during the 2010 to 2011 planning period. Weighted-average, buy-bid FTR obligation prices were \$0.12 less per MW for counter flow FTRs and \$0.04 more per MW for prevailing flow FTRs compared to the previous planning period.

On average during the 2011 to 2012 planning period in the Annual FTR Auction, self scheduled counter flow FTRs were priced \$0.36 per MW higher than buy-bid counter flow obligation FTRs and self scheduled prevailing FTRs were priced \$0.41 per MW higher than buy-bid prevailing flow obligation FTRs.

Table 12-15 Annual FTR Auction weighted-average cleared prices (Dollars per MW): Planning period 2011 to 2012

Trade Type	Hedge Type	FTR Direction	Class Type			
			24-Hour	On Peak	Off Peak	All
Buy bids	Obligations	Counter Flow	(\$0.76)	(\$0.51)	(\$0.38)	(\$0.47)
		Prevailing Flow	\$1.04	\$0.86	\$0.62	\$0.79
		Total	\$0.68	\$0.44	\$0.28	\$0.41
	Options	Counter Flow	\$0.00	\$0.00	\$0.00	\$0.00
		Prevailing Flow	\$0.89	\$0.20	\$0.11	\$0.16
		Total	\$0.89	\$0.20	\$0.11	\$0.16
Self-scheduled bids	Obligations	Counter Flow	(\$0.11)	NA	NA	(\$0.11)
		Prevailing Flow	\$1.20	NA	NA	\$1.20
		Total	\$1.16	NA	NA	\$1.16
Buy and self-scheduled bids	Obligations	Counter Flow	(\$0.62)	(\$0.51)	(\$0.38)	(\$0.46)
		Prevailing Flow	\$1.15	\$0.86	\$0.62	\$0.91
		Total	\$1.00	\$0.44	\$0.28	\$0.58
	Options	Counter Flow	\$0.00	\$0.00	\$0.00	\$0.00
		Prevailing Flow	\$0.89	\$0.20	\$0.11	\$0.16
		Total	\$0.89	\$0.20	\$0.11	\$0.16
Sell offers	Obligations	Counter Flow	(\$3.16)	(\$0.70)	(\$0.61)	(\$0.87)
		Prevailing Flow	\$1.09	\$0.71	\$0.41	\$0.59
		Total	(\$0.12)	\$0.51	\$0.21	\$0.34
	Options	Counter Flow	NA	NA	NA	NA
		Prevailing Flow	\$0.00	\$2.05	\$0.47	\$0.75
		Total	\$0.00	\$2.05	\$0.47	\$0.75

The 2011 to 2012 planning period price frequency for cleared buy bids in Figure 12-6 shows that 87.1 percent of Annual FTRs were purchased for less than \$1 per MW. Negative prices occur because some FTRs are bid with negative prices and some winning FTR bidders are paid to take FTRs (counter flow FTRs). The 2011 to 2012 planning period FTR obligation price frequency for cleared buy bids in Figure 12-6 shows that 85.2 percent of annual FTR obligations were purchased for less than \$1 per MW. The 2011 to 2012 planning period FTR option price frequency for cleared buy bids in Figure 12-6 shows that 98.0 percent of annual FTR options were purchased for less than \$1 per MW. Buy bids, obligation buy bids and option buy bids cleared for \$0 per MW accounted for 16.4, 14.4 and 28.3 percent of the annual volume.

Figure 12-6 Annual FTR auction clearing price per MW: Planning period 2011 to 2012

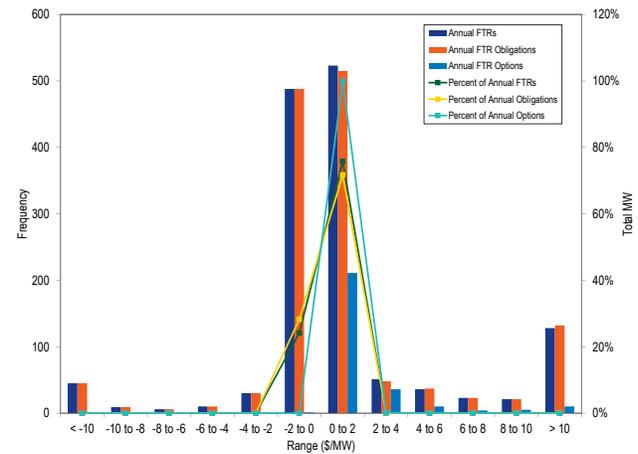


Table 12-16 shows the weighted-average cleared buy-bid price in the Monthly Balance of Planning Period FTR Auctions by bidding period for January 2011 through December 2011. For example, for the June 2011 Monthly Balance of Planning Period FTR Auction, the current month column is June, the second month column is July and the third month column is August. Quarters 1 through 4 are represented in the Q1, Q2, Q3 and Q4 columns. The total column represents all of the activity within the June 2011 Monthly Balance of Planning Period FTR Auction.

The cleared, weighted-average price paid in the Monthly Balance of Planning Period FTR Auctions during the first seven months of the 2011 to 2012 planning period was \$0.10 per MW, compared with \$0.13 per MW for the full 12-month 2010 to 2011 planning period.

Table 12-16 Monthly Balance of Planning Period FTR Auction cleared, weighted-average, buy-bid price per period (Dollars per MW): Calendar year 2011

Monthly Auction	Current Month	Second Month	Third Month	Q1	Q2	Q3	Q4	Total
Jan-11	\$0.13	\$0.36	\$0.02				\$0.28	\$0.17
Feb-11	\$0.08	\$0.13	\$0.11				\$0.18	\$0.10
Mar-11	\$0.09	\$0.16	\$0.15				\$0.04	\$0.09
Apr-11	\$0.07	\$0.23						\$0.08
May-11	\$0.06							\$0.06
Jun-11	\$0.06	\$0.15	\$0.07	\$0.33	\$0.12	\$0.20	\$0.13	\$0.13
Jul-11	\$0.10	\$0.15	\$0.03		\$0.01	\$0.14	\$0.02	\$0.08
Aug-11	\$0.12	\$0.04	\$0.10		\$0.17	\$0.20	\$0.13	\$0.14
Sep-11	\$0.11	\$0.24	\$0.18		\$0.20	\$0.24	\$0.15	\$0.16
Oct-11	\$0.09	\$0.17	\$0.09			\$0.20	\$0.11	\$0.12
Nov-11	\$0.09	\$0.25	\$0.13			\$0.11	\$0.11	\$0.11
Dec-11	\$0.10	\$0.33	\$0.18			\$1.41	\$0.25	\$0.19

Revenue

Long Term FTR Auction Revenue

Table 12-17 shows Long Term FTR Auction revenue data by trade type, FTR direction, period type, and class type. The 2012 to 2015 Long Term FTR Auction netted \$20.5 million in revenue, \$29.3 million less than the previous Long Term FTR Auction. Buyers paid \$54.4 million and sellers received \$33.8 million, down \$10.8 million and up \$17.4 million over the previous Long Term FTR Auction.

For the 2012 to 2015 Long Term FTR Auction, the counter flow FTRs netted -\$117.5 million in revenue, down \$72.2 million from the previous Long Term FTR Auction, with buyers receiving \$128.3 million and sellers paying \$10.8 million. Prevailing flow FTRs netted \$138.0 million in revenue, down \$101.5 million from the previous Long Term FTR Auction, with buyers paying \$182.7 million and sellers receiving \$44.6 million.

Table 12-18 shows that overall, net revenue from the 2012 to 2015 Long Term FTR Auction is down from \$49.8 million to \$20.5 million (58.8 percent) from the 2011 to 2014 Long Term FTR Auction and is the lowest net revenue in the history of the Long Term FTR Auction. This may be attributed to several factors, including an increase in counter flow buy bids, which participants are paid to take, decreasing initial revenue by \$128.3 million for the 2012 to 2015 auction. Another factor is the increase in Long Term FTR sell offers, which have been steadily increasing since the Long Term FTR Auction's inception, with the 2012 to 2015 Long Term FTR Auction more than twice the sell offer revenue in the prior Long Term Auction. There was no cleared volume for three year long term FTRs in the 2012 to 2015 Long Term FTR Auction, and three year FTR demand has steadily decreased since the inception of the Long Term FTR Auction.

Figure 12-7 summarizes total revenue associated with all FTRs, regardless of source, to the FTR sinks that produced the largest positive and negative revenue from the 2012 to 2015 Long Term FTR Auction.³⁸ The top 10 positive revenue producing FTR sinks accounted for \$53.6 million of the total revenue of \$20.5 million paid in the auction.³⁹ They also comprised 3.7 percent of all FTRs bought in the auction. The sinks with the highest positive auction revenue are all control zones or large aggregates. The top 10 negative revenue producing FTR sinks accounted for -\$26.8 million of revenue and constituted 3.9 percent of all FTRs bought in the auction.

³⁸ As some FTRs are bid with negative prices, some winning FTR bidders are paid to take FTRs. These are counter flow FTRs. These payments reduce net auction revenue. Therefore, the sum of the highest revenue producing FTRs can exceed net auction revenue.

³⁹ The total positive revenue producing FTR sinks was \$120.56 million and the total negative revenue producing FTR sinks was -\$100.64 million. The overall revenue paid in the auction was \$20.5 million.

Table 12-17 Long Term FTR Auction revenue: Planning periods 2012 to 2015

Trade Type	FTR Direction	Period Type	Class Type			
			24-Hour	On Peak	Off Peak	All
Buy bids	Counter Flow	Year 1	(\$8,646,093)	(\$26,837,405)	(\$22,445,688)	(\$57,929,185)
		Year 2	(\$4,681,619)	(\$18,461,021)	(\$16,140,474)	(\$39,283,114)
		Year 3	(\$1,047,559)	(\$16,584,285)	(\$13,471,719)	(\$31,103,562)
		Year All	\$0	\$0	\$0	\$0
		Total	(\$14,375,271)	(\$61,882,711)	(\$52,057,880)	(\$128,315,861)
	Prevailing Flow	Year 1	\$11,599,289	\$39,631,430	\$28,817,525	\$80,048,244
		Year 2	\$10,702,005	\$26,490,902	\$19,897,739	\$57,090,646
		Year 3	\$5,397,207	\$23,259,187	\$16,882,121	\$45,538,515
		Year All	\$0	\$0	\$0	\$0
		Total	\$27,698,501	\$89,381,519	\$65,597,385	\$182,677,404
Total			\$13,323,230	\$27,498,808	\$13,539,504	\$54,361,543
Sell offers	Counter Flow	Year 1	(\$448,019)	(\$3,540,398)	(\$2,079,186)	(\$6,067,603)
		Year 2	(\$316,731)	(\$2,587,881)	(\$1,325,663)	(\$4,230,275)
		Year 3	0	(\$304,508)	(\$222,651)	(\$527,158)
		Year All	NA	NA	NA	NA
		Total	(\$764,749)	(\$6,432,787)	(\$3,627,500)	(\$10,825,036)
	Prevailing Flow	Year 1	\$1,383,987	\$14,787,335	\$7,770,664	\$23,941,986
		Year 2	\$1,743,472	\$10,853,714	\$6,159,723	\$18,756,909
		Year 3	19,843	\$1,126,699	\$799,056	\$1,945,599
		Year All	NA	NA	NA	NA
		Total	\$3,147,302	\$26,767,748	\$14,729,444	\$44,644,494
Total			\$2,382,553	\$20,334,961	\$11,101,944	\$33,819,458
Total			\$10,940,678	\$7,163,847	\$2,437,560	\$20,542,085

Table 12-18 Long Term FTR Auction revenue from the 2009 to 2012 Auction through the 2012 to 2015 Auction

Trade Type	FTR Direction	Period Type	2009/2012 Auction	2010/2013 Auction	2011/2014 Auction	2012/2015 Auction	
Buy	Counterflow	Year 1	(\$47,506,196)	(\$43,961,311)	(\$87,222,994)	(\$57,929,185)	
		Year 2	(\$29,119,334)	(\$25,626,515)	(\$57,552,497)	(\$39,283,113)	
		Year 3	(\$16,628,100)	(\$17,992,866)	(\$47,339,689)	(\$31,103,562)	
		Year All	(\$1,606,901)	(\$308,164)	(\$698,514)	\$0	
		Total	(\$94,860,532)	(\$87,888,858)	(\$192,813,696)	(\$128,315,861)	
	Prevailing Flow	Year 1	\$61,492,662	\$58,440,660	\$116,381,205	\$80,048,243	
		Year 2	\$35,079,120	\$38,579,690	\$76,449,064	\$57,090,645	
		Year 3	\$17,460,435	\$28,763,253	\$66,139,797	\$45,538,514	
		Year All	\$21,043,160	\$1,211,686	\$44,581	\$0	
		Total	\$135,075,378	\$126,995,291	\$259,014,648	\$182,677,404	
Total			\$40,214,845	\$39,106,433	\$66,200,951	\$54,361,542	
Sell	Counterflow	Year 1	(\$151,195)	(\$161,452)	(\$2,564,824)	(\$6,067,602)	
		Year 2	(\$159,891)	(\$37,500)	(\$467,168)	(\$4,230,274)	
		Year 3	(\$589,019)	(\$10,019)	(\$110,827)	(\$527,158)	
		Total	(\$900,106)	(\$208,972)	(\$3,142,820)	(\$10,825,036)	
		Prevailing Flow	Year 1	\$1,158,167	\$3,697,625	\$12,076,791	\$23,941,985
	Year 2		\$323,559	\$4,041,231	\$6,642,893	\$18,756,909	
	Year 3		\$701,827	\$441,407	\$821,794	\$1,945,598	
	Total		\$2,183,554	\$8,180,264	\$19,541,479	\$44,644,493	
	Total			\$1,283,448	\$7,971,291	\$16,398,658	\$33,819,457
	Net Revenue			\$38,931,397	\$31,135,141	\$49,802,292	\$20,542,085

Figure 12-7 Ten largest positive and negative revenue producing FTR sinks purchased in the Long Term FTR Auction: Planning periods 2012 to 2015⁴⁰

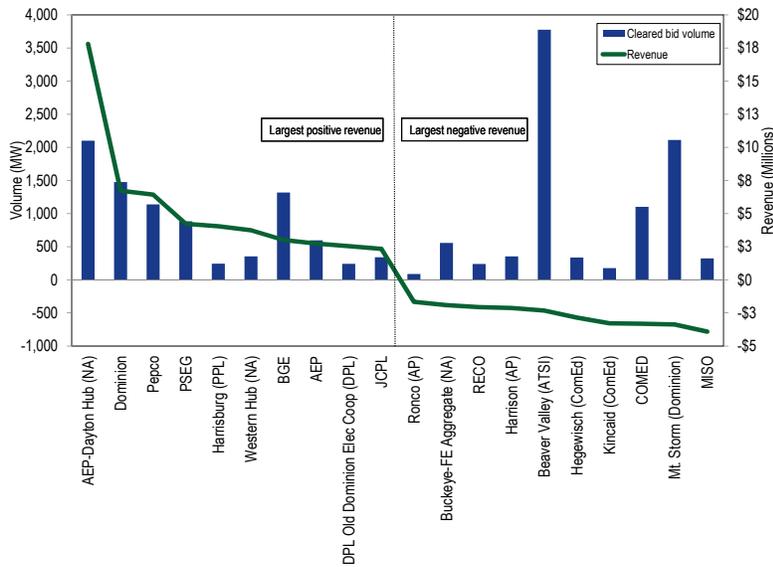
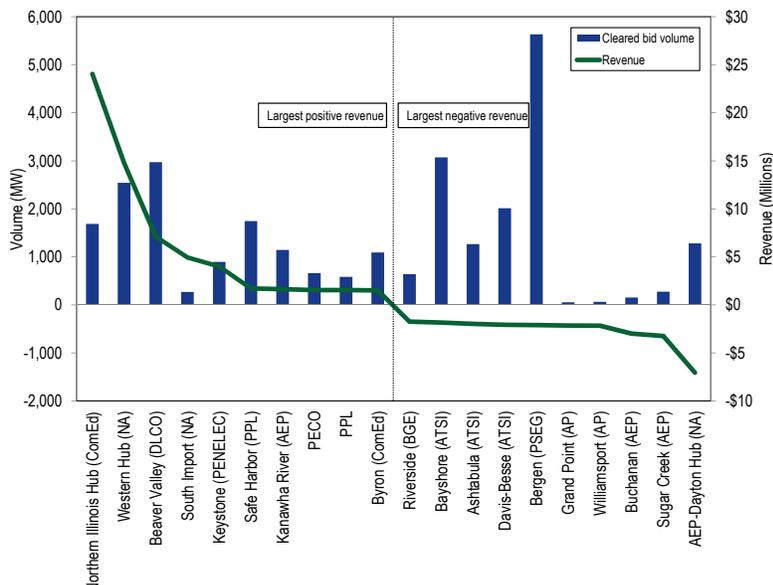


Figure 12-8 summarizes total revenue associated with all FTRs, regardless of sink, from the FTR sources that produced the largest positive and negative revenue from the 2012 to 2015 Long Term FTR Auction. The top 10 positive revenue producing FTR sources accounted for \$62.78 million of the total revenue of \$19.28 million paid in the auction. They also comprised 5.9 percent of all FTRs bought in the auction. The top 10 negative revenue producing FTR sources accounted for -\$27.34 million of revenue and constituted 6.3 percent of all FTRs bought in the auction.

Annual FTR Auction Revenue

Table 12-19 shows Annual FTR Auction revenue data by trade type, hedge type, FTR direction and class type. For the 2011 to 2012 planning period, the Annual FTR Auction revenue was down \$20.2 million to \$1,029.6 million from the previous Annual FTR Auction, with buyers paying \$1,068.3 million, up \$8.3 million, and sellers receiving \$38.6 million, up \$28.4 million from the previous Annual FTR Auction.

Figure 12-8 Ten largest positive and negative revenue producing FTR sources purchased in the Long Term FTR Auction: Planning periods 2012 to 2015



For the 2011 to 2012 planning period, counter flow FTRs in the Annual FTR Auction netted -\$182.3 million in revenue, increased -\$61.3 million over the previous Annual FTR Auction, with buyers receiving \$198.8 million and sellers paying \$16.5 million, and the prevailing flow FTRs in the Annual FTR Auction netted \$1,212.0 million in revenue, up \$41.2 million from the previous Annual FTR Auction, with buyers paying \$1,267.1 million and sellers receiving \$55.1 million. Since counter flow FTRs bids are paid to take the FTRs, the FTR revenues for counter flow FTR bids are negative and FTR revenues for sales of counter flow FTRs are positive.

Figure 12-9 summarizes total revenue associated with all FTRs, regardless of source, to the FTR sinks that produced the largest positive and negative revenue from the Annual FTR Auction for the 2011 to 2012 planning period. The top 10 positive revenue producing FTR

⁴⁰ For Figure 12-7 through Figure 12-15, each FTR sink and source that is not a control zone has its corresponding control zone listed in parentheses after its name. Most FTR sink and source control zone identifications for hubs and interface pricing points are listed as NA because they cannot be assigned to a specific control zone.

Table 12-19 Annual FTR Auction revenue: Planning period 2011 to 2012

Trade Type	Hedge Type	FTR Direction	Class Type			
			24-Hour	On Peak	Off Peak	All
Buy bids	Obligations	Counter Flow	(\$31,727,221)	(\$86,595,481)	(\$79,270,931)	(\$197,593,633)
		Prevailing Flow	\$173,929,276	\$333,218,996	\$253,894,947	\$761,043,219
		Total	\$142,202,056	\$246,623,514	\$174,624,016	\$563,449,586
	Options	Counter Flow	\$0	\$0	\$0	\$0
		Prevailing Flow	\$1,243,985	\$19,888,318	\$12,943,329	\$34,075,631
		Total	\$1,243,985	\$19,888,318	\$12,943,329	\$34,075,631
	Total	Counter Flow	(\$31,727,221)	(\$86,595,481)	(\$79,270,931)	(\$197,593,633)
		Prevailing Flow	\$175,173,262	\$353,107,313	\$266,838,275	\$795,118,850
		Total	\$143,446,041	\$266,511,832	\$187,567,345	\$597,525,217
Self-scheduled bids	Obligations	Counter Flow	(\$1,219,303)	NA	NA	(\$1,219,303)
		Prevailing Flow	\$471,940,076	NA	NA	\$471,940,076
		Total	\$470,720,773	NA	NA	\$470,720,773
Buy and self-scheduled bids	Obligations	Counter Flow	(\$32,946,524)	(\$86,595,481)	(\$79,270,931)	(\$198,812,936)
		Prevailing Flow	\$645,869,353	\$333,218,996	\$253,894,947	\$1,232,983,295
		Total	\$612,922,829	\$246,623,514	\$174,624,016	\$1,034,170,359
	Options	Counter Flow	\$0	\$0	\$0	\$0
		Prevailing Flow	\$1,243,985	\$19,888,318	\$12,943,329	\$34,075,631
		Total	\$1,243,985	\$19,888,318	\$12,943,329	\$34,075,631
	Total	Counter Flow	(\$32,946,524)	(\$86,595,481)	(\$79,270,931)	(\$198,812,936)
		Prevailing Flow	\$647,113,338	\$353,107,313	\$266,838,275	\$1,267,058,926
		Total	\$614,166,814	\$266,511,832	\$187,567,345	\$1,068,245,990
Sell offers	Obligations	Counter Flow	(\$5,147,167)	(\$5,228,336)	(\$6,092,443)	(\$16,467,946)
		Prevailing Flow	\$4,479,226	\$33,317,024	\$16,705,071	\$54,501,321
		Total	(\$667,941)	\$28,088,688	\$10,612,627	\$38,033,375
	Options	Counter Flow	\$0	\$0	\$0	\$0
		Prevailing Flow	\$0	\$275,150	\$294,744	\$569,895
		Total	\$0	\$275,150	\$294,744	\$569,895
	Total	Counter Flow	(\$5,147,167)	(\$5,228,336)	(\$6,092,443)	(\$16,467,946)
		Prevailing Flow	\$4,479,226	\$33,592,175	\$16,999,815	\$55,071,216
		Total	(\$667,941)	\$28,363,839	\$10,907,372	\$38,603,270
Total		\$614,834,755	\$238,147,993	\$176,659,973	\$1,029,642,720	

sinks accounted for \$871.5 million (84.6 percent) of the total revenue of \$1,029.7 million paid in the auction. They also comprised 27.3 percent of all FTRs bought in the auction. The sinks with the highest positive auction revenue are all control zones or large aggregates. The top 10 negative revenue producing FTR sinks accounted for -\$71.2 million of revenue and constituted 3.0 percent of all FTRs bought in the auction.

Figure 12-9 Ten largest positive and negative revenue producing FTR sinks purchased in the Annual FTR Auction: Planning period 2011 to 2012

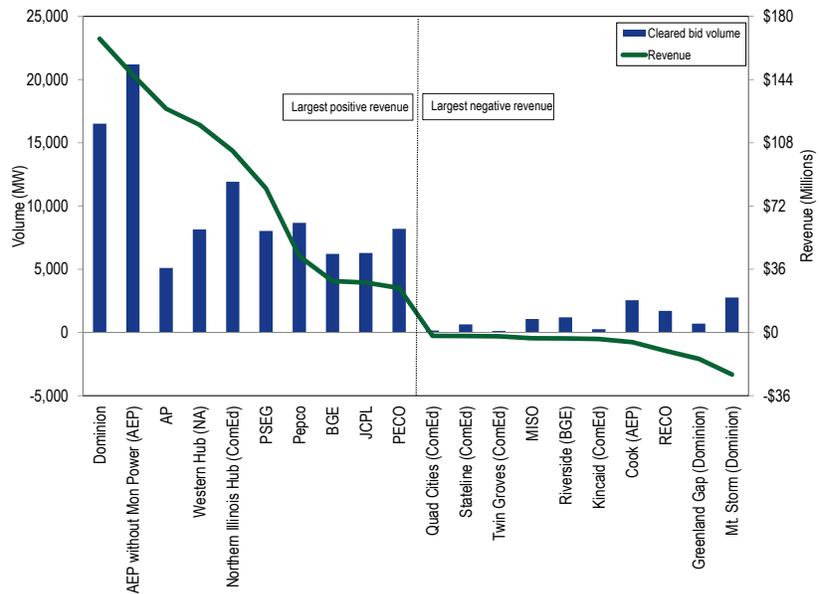
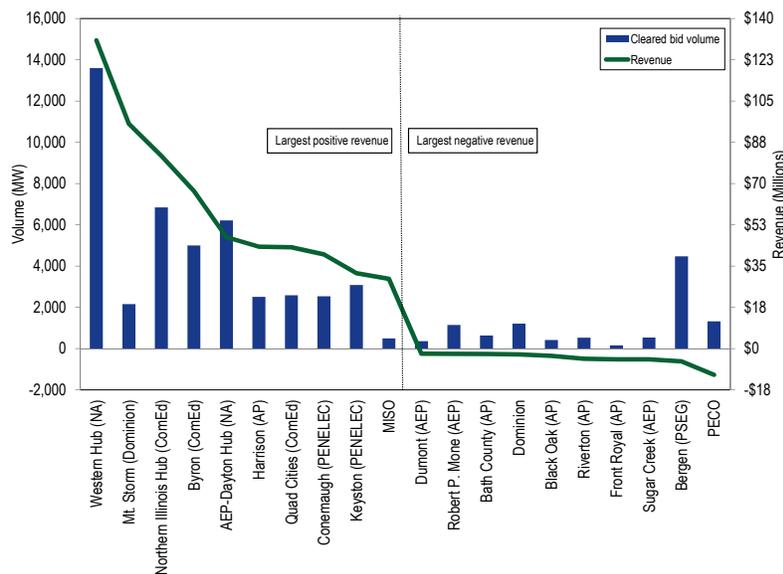


Figure 12-10 summarizes total revenue associated with all FTRs, regardless of sink, from the FTR sources that produced the largest positive and negative revenue from the Annual FTR Auction for the 2011 to 2012 planning period. The top 10 positive revenue producing FTR sources accounted for \$609.82 million (59.2 percent) of the total revenue of \$1,030.96 million paid in the auction. They also comprised 12.3 percent of all FTRs bought in the auction. The top 10 negative revenue producing FTR sources accounted for -\$42.30 million of revenue and constituted 2.9 percent of all FTRs bought in the auction.

Figure 12-10 Ten largest positive and negative revenue producing FTR sources purchased in the Annual FTR Auction: Planning period 2011 to 2012



Monthly Balance of Planning Period FTR Auction Revenue

Table 12-20 shows Monthly Balance of Planning Period FTR Auction revenue data by trade type, hedge type and class type. For the 2011 to 2012 planning period through December 31, 2011, the Monthly Balance of Planning Period FTR Auctions netted \$22.1 million in revenue, with buyers paying \$106.4 million and sellers receiving \$84.3 million. For the entire 2010 to 2011 planning period, the Monthly Balance of Planning Period FTR

Auctions netted \$41.8 million in revenue, with buyers paying \$35.5 million and sellers receiving \$77.3 million.

Figure 12-11 summarizes total revenue associated with all FTRs, regardless of source, to the FTR sinks that produced the largest positive and negative revenue in the Monthly Balance of Planning Period FTR Auctions during the first seven months of the 2011 to 2012 planning period. The top 10 positive revenue producing FTR sinks accounted for \$45.6 million of revenue and 3.6 percent of all FTRs bought in the Monthly Balance of Planning Period FTR Auctions. The top 10 negative revenue producing FTR sinks accounted for -\$16.5 million of revenue and constituted 1.8 percent of all FTRs bought in the auctions. The MW volume is the net of all buys and sells from the Monthly Balance of

Planning Period FTR Auctions during the 2011 to 2012 planning period. The net market volume sinking in the Dominion zone was negative since the total cleared volume of the monthly FTR buy bids sinking in the Dominion zone was less than the total cleared volume of the monthly FTR sell offers sinking in the Dominion zone.

Figure 12-12 summarizes total revenue associated with all FTRs, regardless of sink, from the FTR sources that produced the largest positive and negative revenue from the Monthly Balance of Planning Period FTR Auctions during the first seven months of the 2011 to 2012 planning period. The top 10 positive revenue producing FTR sources accounted for \$54.72 million and 4.1 percent of all FTRs bought in the auctions. The top 10 negative revenue producing FTR sources accounted for -\$16.76 million of revenue and constituted 0.6 percent of all FTRs bought in the auctions.

Table 12-20 Monthly Balance of Planning Period FTR Auction revenue: Calendar year 2011

Monthly Auction	Hedge Type	Trade Type	Class Type			
			24-Hour	On Peak	Off Peak	All
Jan-11	Obligations	Buy bids	(\$1,205,888)	\$7,104,026	\$6,539,294	\$12,437,433
		Sell offers	\$1,138,221	\$2,625,465	\$4,050,289	\$7,813,975
	Options	Buy bids	\$0	\$136,353	\$87,800	\$224,153
		Sell offers	\$0	\$1,812,131	\$686,209	\$2,498,340
Feb-11	Obligations	Buy bids	(\$36,220)	\$4,296,859	\$3,345,841	\$7,606,480
		Sell offers	\$587,026	\$1,938,472	\$2,305,072	\$4,830,570
	Options	Buy bids	\$0	\$126,188	\$25,671	\$151,859
		Sell offers	\$1,947	\$1,218,343	\$389,391	\$1,609,682
Mar-11	Obligations	Buy bids	(\$101,074)	\$4,605,081	\$3,368,274	\$7,872,281
		Sell offers	\$423,197	\$2,274,909	\$1,933,265	\$4,631,371
	Options	Buy bids	\$14,085	\$292,986	\$178,090	\$485,161
		Sell offers	\$5,149	\$1,231,751	\$454,338	\$1,691,239
Apr-11	Obligations	Buy bids	\$374,217	\$2,884,005	\$1,629,459	\$4,887,681
		Sell offers	\$677,941	\$1,461,719	\$878,890	\$3,018,551
	Options	Buy bids	\$4,569	\$88,824	\$54,691	\$148,084
		Sell offers	\$3,727	\$721,783	\$403,883	\$1,129,392
May-11	Obligations	Buy bids	\$451,258	\$2,063,976	\$1,214,403	\$3,729,637
		Sell offers	\$210,714	\$1,074,632	\$567,818	\$1,853,164
	Options	Buy bids	\$0	\$91,362	\$181,717	\$273,078
		Sell offers	\$185	\$539,763	\$393,717	\$933,665
Jun-11	Obligations	Buy bids	\$1,960,494	\$13,115,229	\$8,318,764	\$23,394,487
		Sell offers	\$5,175,453	\$5,288,319	\$2,797,969	\$13,261,740
	Options	Buy bids	\$0	\$186,515	\$192,243	\$378,758
		Sell offers	\$0	\$3,103,330	\$2,147,165	\$5,250,495
Jul-11	Obligations	Buy bids	\$2,169,505	\$6,367,118	\$4,209,356	\$12,745,978
		Sell offers	(\$2,192,924)	\$4,283,630	\$2,794,481	\$4,885,187
	Options	Buy bids	\$51,761	\$1,117,027	\$549,087	\$1,717,875
		Sell offers	\$0	\$2,862,215	\$1,919,105	\$4,781,320
Aug-11	Obligations	Buy bids	\$452,651	\$12,262,357	\$5,644,491	\$18,359,499
		Sell offers	\$331,875	\$7,816,757	\$3,706,720	\$11,855,353
	Options	Buy bids	\$0	\$596,709	\$482,609	\$1,079,318
		Sell offers	\$0	\$2,652,228	\$1,190,174	\$3,842,402
Sep-11	Obligations	Buy bids	\$1,787,959	\$8,393,963	\$3,116,850	\$13,298,772
		Sell offers	\$276,769	\$5,516,851	\$2,229,736	\$8,023,356
	Options	Buy bids	\$9,087	\$722,750	\$580,167	\$1,312,004
		Sell offers	\$0	\$2,173,747	\$1,218,088	\$3,391,835
Oct-11	Obligations	Buy bids	\$510,469	\$6,508,454	\$4,002,264	\$11,021,187
		Sell offers	\$301,550	\$3,303,791	\$2,146,912	\$5,752,253
	Options	Buy bids	\$0	\$348,970	\$340,721	\$689,691
		Sell offers	\$0	\$1,714,474	\$1,154,194	\$2,868,668
Nov-11	Obligations	Buy bids	\$1,811,171	\$4,565,795	\$2,214,612	\$8,591,579
		Sell offers	\$317,883	\$3,965,511	\$1,649,356	\$5,932,751
	Options	Buy bids	\$0	\$426,283	\$262,337	\$688,620
		Sell offers	\$3,388	\$1,390,406	\$851,088	\$2,244,883
Dec-11	Obligations	Buy bids	\$787,210	\$5,304,596	\$6,602,766	\$12,694,571
		Sell offers	(\$435,710)	\$4,610,174	\$5,744,990	\$9,919,454
	Options	Buy bids	\$0	\$230,986	\$198,041	\$429,027
		Sell offers	\$2,829	\$1,271,168	\$1,006,526	\$2,280,523
2010/2011*	Obligations	Buy bids	(\$439,619)	\$27,205,953	\$19,325,016	\$46,091,350
		Sell offers	\$3,037,099	\$9,572,999	\$9,892,420	\$22,502,518
	Options	Buy bids	\$49,085	\$2,361,970	\$2,364,609	\$4,775,664
		Sell offers	\$601,925	\$12,511,499	\$7,966,991	\$21,080,415
Total		(\$4,029,558)	\$7,483,426	\$3,830,213	\$7,284,081	
2011/2012**	Obligations	Buy bids	\$9,479,458	\$56,517,511	\$34,109,103	\$100,106,073
		Sell offers	\$3,774,896	\$34,785,034	\$21,070,164	\$59,630,094
	Options	Buy bids	\$60,848	\$3,629,240	\$2,605,205	\$6,295,292
		Sell offers	\$6,217	\$15,167,568	\$9,486,341	\$24,660,126
Total		\$5,759,194	\$10,194,149	\$6,157,804	\$22,111,146	

* Shows Twelve Months for 2010/2011; ** Shows seven months ended 31-Dec-2011 for 2011/2012

Figure 12-11 Ten largest positive and negative revenue producing FTR sinks purchased in the Monthly Balance of Planning Period FTR Auctions: Planning period 2011 to 2012 through December 31, 2011

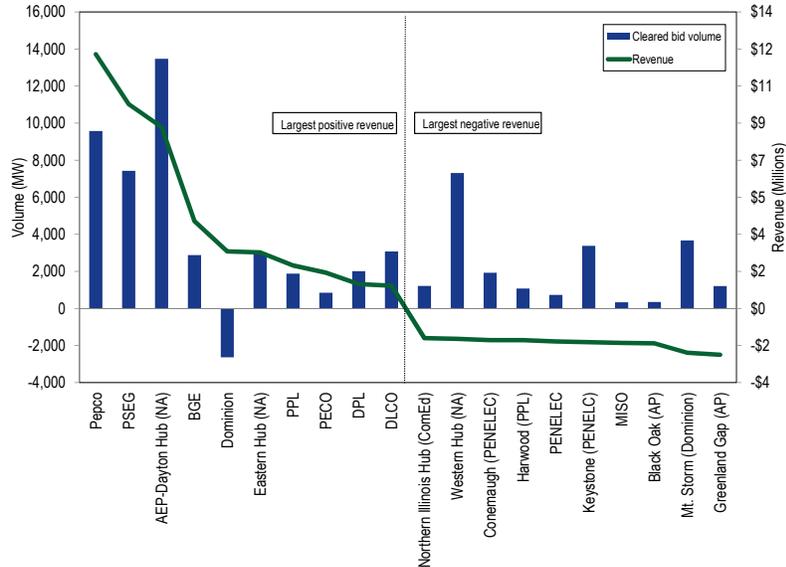
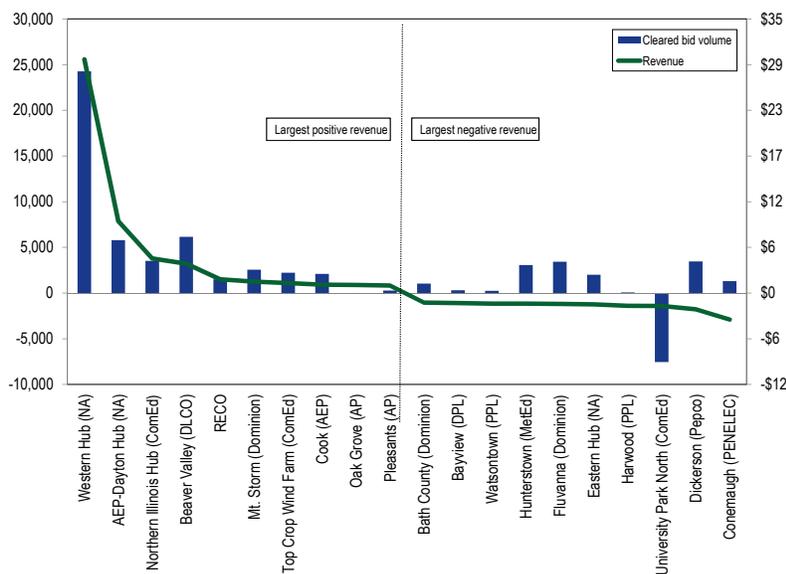


Figure 12-12 Ten largest positive and negative revenue producing FTR sources purchased in the Monthly Balance of Planning Period FTR Auctions: Planning period 2011 to 2012 through December 31, 2011



Revenue Adequacy

Congestion revenue is created in an LMP system when all loads pay and all generators receive their respective LMPs. When load pays more than the amount that generators receive, excluding losses, positive congestion revenue exists and is available to cover the target allocations of FTR holders. The load MW exceed the generation MW in constrained areas because part of the load is served by imports using transmission capability into the constrained areas. That is why load, which pays for the transmission capability, receives ARRs to offset congestion in the constrained areas. Generating units that are the source of such imports are paid the price at their own bus which does not reflect congestion in constrained areas. Generation in constrained areas receives the congestion price and all load in constrained areas pays the congestion price. As a result, load congestion payments are greater than the congestion-related payments to generation.⁴¹ In general, FTR revenue adequacy exists when the sum of congestion credits is as great as the sum of congestion across the positively valued FTRs.

Revenue adequacy must be distinguished from the adequacy of FTRs as an offset against congestion. Revenue adequacy is a narrower concept that compares the revenues available to cover congestion to the target allocations across specific paths for which FTRs were available and purchased. The adequacy of FTRs as an offset against congestion compares FTR revenues to total congestion on the system as a measure of the extent to which FTRs offset the actual, total congestion across all paths paid by market participants, regardless of the availability or purchase of FTRs.

⁴¹ For an illustration of how total congestion revenue is generated and how FTR target allocations and congestion receipts are determined, see Table G-1, "Congestion revenue, FTR target allocations and FTR congestion credits: Illustration," *MMU Technical Reference for PJM Markets*, at "Financial Transmission and Auction Revenue Rights."

FTRs are paid each month from congestion revenues, both day ahead and balancing, FTR auction revenues and excess revenues carried forward from prior months and distributed back from later months. At the end of a planning period, if some months remain not fully funded, an uplift charge is collected from any FTR market participants that hold FTRs during the planning period based on their pro rata share of total net positive FTR target allocations, excluding any charge to FTR holders with a net negative FTR position for the planning year. For the 2010 to 2011 planning period, FTRs were not fully funded and thus an uplift charge was collected.

Table 12-21 shows the composition of FTR target allocations and FTR revenues for the 2010 to 2011 and the 2011 to 2012 planning periods, with the latter shown through December 31, 2011. FTR targets are composed of FTR target allocations and associated adjustments. Other adjustments may be made for items such as modeling changes or errors.

FTR revenues are primarily comprised of hourly congestion revenue, from the day ahead and balancing markets, and net negative congestion. FTR revenues also include ARR excess which is the difference between ARR target allocations and FTR auction revenues. Competing use revenues are based on the Unscheduled Transmission Service Agreement between the New York Independent System Operator (NYISO) and PJM. This agreement sets forth the terms and conditions under which compensation is provided for transmission service in connection with transactions not scheduled directly or otherwise prearranged between NYISO and PJM. Congestion revenues appearing in Table 12-21 include both congestion charges associated with PJM facilities and those associated with reciprocal, coordinated flowgates in the MISO whose operating limits are respected by PJM.⁴² The operating protocol governing the wheeling contracts between Public Service Electric and Gas Company (PSE&G) and Consolidated Edison Company of New York (Con Edison) resulted in a reimbursement of \$0.1 million in congestion charges to Con Edison in the 2011 to 2012 planning period through December 31, 2011.^{43,44}

42 See "Joint Operating Agreement between the Midwest Independent System Operator, Inc. and PJM Interconnection, L.L.C." (December 11, 2008), Section 6.1 <<http://www.pjm.com/~Media/documents/agreements/joa-complete.ashx>>. (Accessed March 13, 2012)

43 111 FERC ¶ 61,228 (2005).

44 See the 2010 State of the Market Report for PJM, Volume II, Section 4, "Interchange Transactions," at "Con Edison and PSE&G Wheeling Contracts" and Appendix E, "Interchange Transactions" at Table D-2, "Con Edison and PSE&G wheel settlements data: Calendar year 2010."

For the current planning period, no charges have been made to the Day Ahead Operating Reserves. These charges may be necessary if the hourly congestion revenues are negative at the end of the month. If this happens, charges are made and allocated as additional Day-Ahead Operating Reserves charges during the month. This means that within an hour, the congestion dollars collected from load were less than the congestion dollars paid to generation. This is accounted for as a charge, which is allocated to Day-Ahead Operating Reserves. This type of adjustment is infrequent, occurring only three times in the 2010 to 2011 planning period.

Table 12-21 Total annual PJM FTR revenue detail (Dollars (Millions)): Planning periods 2010 to 2011 and 2011 to 2012

Accounting Element	2010/2011	2011/2012*
ARR information		
ARR target allocations	\$1,031.0	\$574.7
FTR auction revenue	\$1,097.8	\$639.1
ARR excess	\$66.9	\$64.4
FTR targets		
FTR target allocations	\$1,687.6	\$672.7
Adjustments:		
Adjustments to FTR target allocations	(\$1.8)	(\$0.8)
Total FTR targets	\$1,685.8	\$671.9
FTR revenues		
ARR excess	\$66.9	\$64.4
Competing uses	\$0.1	\$0.0
Congestion		
Net Negative Congestion (enter as negative)	(\$59.5)	(\$33.2)
Hourly congestion revenue	\$1,464.9	\$597.0
Midwest ISO M2M (credit to PJM minus credit to Midwest ISO)	(\$47.8)	(\$58.2)
Consolidated Edison Company of New York and Public Service Electric and Gas Company Wheel (CEPSW) congestion credit to Con Edison (enter as negative)	(0.8)	(\$0.1)
Adjustments:		
Excess revenues carried forward into future months	\$0.0	\$0.0
Excess revenues distributed back to previous months	\$2.6	\$0.0
Other adjustments to FTR revenues	2.34	\$0.5
Total FTR revenues	\$1,430.7	\$570.3
Excess revenues distributed to other months	(\$4.6)	\$0.0
Net Negative Congestion charged to DA Operating Reserves	\$7.3	\$0.0
Excess revenues distributed to CEPSW for end-of-year distribution	\$0.0	\$0.0
Excess revenues distributed to FTR holders	\$0.0	\$0.0
Total FTR congestion credits	\$1,433.4	\$570.3
Total congestion credits on bill (includes CEPSW and end-of-year distribution)	\$1,434.2	\$570.5
Remaining deficiency	\$252.4	\$101.6

* Shows seven months ended 31-Dec-11

Table 12-22 Monthly FTR accounting summary (Dollars (Millions)): Planning periods 2010 to 2011 and 2011 to 2012

Period	FTR Revenues (with adjustments)	FTR Target Allocations	FTR Payout Ratio (original)	FTR Credits (with adjustments)	FTR Payout Ratio (with adjustments)	Monthly Credits Excess/Deficiency (with adjustments)
Jun-10	\$194.2	\$196.1	97.8%	\$194.2	99.0%	(\$1.9)
Jul-10	\$275.0	\$273.0	100.0%	\$273.0	100.0%	\$0.0
Aug-10	\$111.3	\$119.2	93.2%	\$111.3	93.4%	(\$7.9)
Sep-10	\$116.7	\$165.3	70.0%	\$116.7	70.6%	(\$48.5)
Oct-10	\$52.4	\$67.4	77.4%	\$52.4	77.8%	(\$14.9)
Nov-10	\$50.0	\$80.0	61.9%	\$50.0	62.6%	(\$29.9)
Dec-10	\$185.0	\$185.0	73.2%	\$185.0	100.0%	\$0.0
Jan-11	\$245.4	\$249.5	98.3%	\$245.4	98.4%	(\$4.0)
Feb-11	\$79.4	\$93.0	85.0%	\$79.4	85.4%	(\$13.6)
Mar-11	\$48.2	\$45.6	100.0%	\$45.6	100.0%	\$0.0
Apr-11	\$38.4	\$73.2	52.4%	\$38.4	52.4%	(\$34.8)
May-11	\$34.6	\$72.5	45.1%	\$34.6	47.7%	(\$37.9)
Summary for Planning Period 2010 to 2011						
Total	\$1,426.1	\$1,619.6		\$1,426.1	88.1%	(\$193.5)
Jun-11	\$134.6	\$154.6	86.9%	\$134.6	87.1%	(\$20.0)
Jul-11	\$178.2	\$181.4	97.8%	\$178.2	98.3%	(\$3.1)
Aug-11	\$70.7	\$73.4	96.2%	\$70.7	96.3%	(\$2.7)
Sep-11	\$69.4	\$88.3	78.6%	\$69.4	78.7%	(\$18.8)
Oct-11	\$38.2	\$52.3	73.0%	\$38.2	73.0%	(\$14.1)
Nov-11	\$32.8	\$57.2	57.4%	\$32.8	57.4%	(\$24.4)
Dec-11	\$46.4	\$64.8	71.6%	\$46.4	71.6%	(\$18.4)
Summary for Planning Period 2011 to 2012 through December 31, 2011						
Total	\$570.3	\$671.9		\$570.3	84.9%	(\$101.6)

FTR target allocations are based on hourly prices in the Day-Ahead Energy Market for the respective FTR paths and equal the revenue required to compensate FTR holders fully for congestion on those specific paths. FTR credits are paid to FTR holders and, depending on market conditions, can be less than the target allocations. Table 12-22 lists the FTR revenues, target allocations, credits, payout ratios, congestion credit deficiencies and excess congestion charges by month. At the end of the 12-month planning period, excess congestion charges are used to offset any monthly congestion credit deficiencies.

The total row in Table 12-22 is not the simple sum of each of the monthly rows because the monthly rows may include excess revenues carried forward from prior months and excess revenues distributed back from later months. For the 2010 to 2011 planning period, the total FTR revenues and FTR credits were \$1,426.1 million which was \$193.5 million less than the total FTR Target Allocations. For the first seven months of the 2010 to 2011 planning period, there is a deficiency of \$101.6 million compared to the \$671.9 million in FTR target allocations.

Figure 12-13 shows the original FTR payout ratio with adjustments by month, excluding excess revenue distribution, for January 2004 through December 2011. The months with payout ratios above 100 percent are overfunded and the months with payout ratios under

100 percent are underfunded. Figure 12-13 also shows the payout ratio after distributing excess revenue across months within the planning period. If there are excess revenues in a given month, the excess is distributed to other months within the planning period that were revenue deficient. The payout ratios for months in the 2011 to 2012 planning period may change if excess revenue is collected in the remainder of the planning period. May 2011 has the lowest monthly payout ratio since January 2004, of 51.8 percent.

Figure 12-13 FTR payout ratio with adjustments by month, excluding and including excess revenue distribution: January 2004 to December 2011

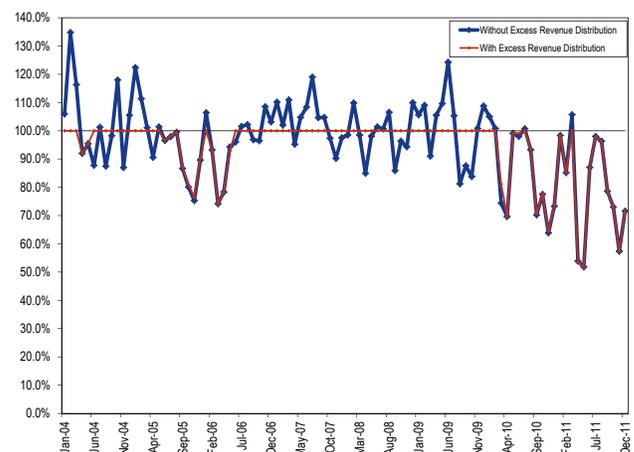


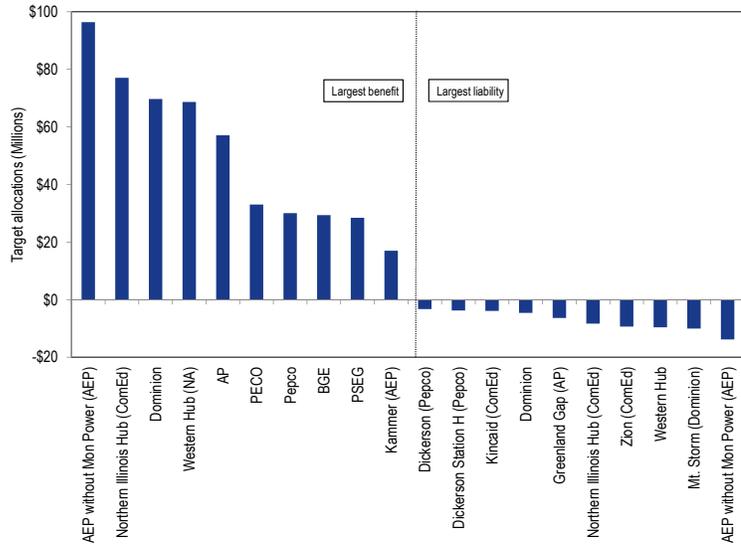
Table 12-23 shows the FTR payout ratio by planning period. FTRs were paid at 85.0 percent of the target allocation level for the 2010 to 2011 planning period and were paid at 84.9 percent of the target allocation level for the 2011 to 2011 planning period through December 31, 2011.

Table 12-23 FTR payout ratio by planning period

Planning Period	FTR Payout Ratio
2003/2004	97.7%
2004/2005	100.0%
2005/2006	90.7%
2006/2007	100.0%
2007/2008	100.0%
2008/2009	100.0%
2009/2010	96.9%
2010/2011	85.0%
2011/2012*	84.9%

* through December 31, 2011

Figure 12-14 Ten largest positive and negative FTR target allocations summed by sink: Planning period 2011 to 2012 through December 31, 2011



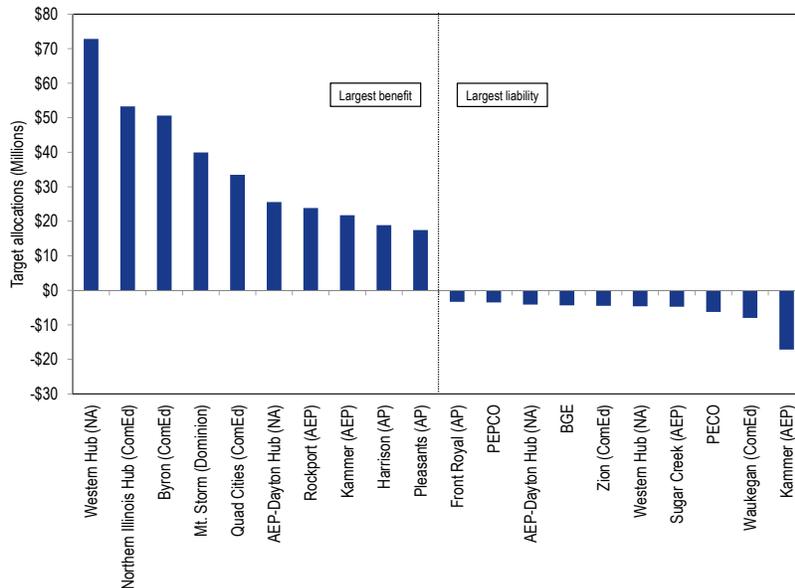
FTR target allocations were examined separately by source and sink contribution. Hourly FTR target allocations were divided into those that were benefits and liabilities and summed by sink and by source for the 2011 to 2012 planning period through December 31, 2011. Figure 12-14 shows the FTR sinks with the largest positive and negative target allocations. The top 10 sinks that produced a financial benefit accounted for 27.7 percent of total positive target allocations during the first seven months of the 2011 to 2012 planning period. FTRs with AEP without Mon Power as the sink included 5.3 percent of all positive target allocations. The sinks with the highest positive target allocations are all control zones or large aggregates. The top 10 sinks that created liability accounted for 15.2 percent of total negative target allocations. FTRs with AEP without Mon Power as the sink encompassed 2.9 percent of all negative target allocations.

Figure 12-15 shows the FTR sources with the largest positive and negative target allocations during the first seven months of the 2011 to 2012 planning period. The top 10 sources with a positive target allocation accounted for 19.6 percent of total positive target allocations. FTRs with the Western Hub as their source included 4.0 percent of all positive target allocations. The top 10 sources with a negative target allocation accounted for 12.6 percent of total negative target allocations. FTRs with Kammer as the source encompassed 3.6 percent of all negative target allocations.

Table 12-24 FTR profits by organization type and FTR direction: Calendar year 2011

Organization Type	FTR Direction					All
	Prevailing Flow	Self Scheduled Prevailing Flow	Counter Flow	Self Scheduled Counter Flow		
Physical	(\$264,471,222)	\$562,471,311	\$44,219,620	(\$1,959,447)		\$340,260,261
Financial	(\$23,247,851)	NA	\$148,945,344	NA		\$125,697,493
Total	(\$287,719,074)	\$562,471,311	\$193,164,964	(\$1,959,447)		\$465,957,753

Figure 12-15 Ten largest positive and negative FTR target allocations summed by source: Planning period 2011 to 2012 through December 31, 2011



Profitability

FTR profitability is the difference between the revenue received for an FTR and the cost of the FTR. For a prevailing flow FTR, the FTR credits are the revenue that an FTR holder receives, after adjusting by the FTR payout ratio for the planning period, and the auction price is the cost. For a counter flow FTR, the auction price is the revenue that an FTR holder receives and the FTR credits are the cost to the FTR holder. The cost of self scheduled FTRs is zero. ARR holders that self schedule FTRs purchase the FTRs in the Annual FTR Auction, but ARR holders receive offsetting ARR credits that equal the purchase price of the FTRs. Table 12-24 lists FTR profits by organization type and FTR direction for the 2011 calendar year. FTR profits are the sum of the daily FTR credits, including self scheduled FTRs, minus the daily FTR auction costs for each FTR held by an organization. The FTR payout ratio was 85.0 percent of the target allocation for the 2010 to 2011 planning period and 84.9 percent for the first seven months

of the 2011 to 2012 planning period. The FTR target allocation is equal to the product of the FTR MW and congestion price differences between sink and source in the Day-Ahead Energy Market. The FTR credits do not include after the fact adjustments. The daily FTR auction costs are the product of the FTR MW and the auction price divided by the time period of the FTR in days, but self scheduled FTRs have zero cost. The results indicate the total FTR profits in 2011 were \$125.7 million for financial entities and \$340.3 million for physical entities. As shown in Table 12-24, not every FTR was profitable. For example, prevailing flow FTRs purchased by physical entities, but not self scheduled, were not profitable in 2011. Prevailing flow FTRs, purchased by financial entities, were not profitable in 2011.

Table 12-25 lists the monthly FTR profits in the 2011 calendar year by organization type. Self scheduled FTRs are listed separately from physical profits to illustrate their impact on overall profits. Total FTR profits were positive and larger in magnitude during the winter and summer months when congestion tended to be higher. The three most profitable months for FTRs were January, July and June. FTR profits decreased during the shoulder months when congestion is less.

**Table 12-25 Monthly FTR profits by organization type:
Calendar year 2011**

Month	Organization Type			Total
	Physical	Financial	Self Scheduled FTRs	
Jan	79,189,162	\$34,569,527	\$58,567,763	\$172,326,451
Feb	(13,218,579)	\$6,234,007	\$52,899,915	\$45,915,343
Mar	(70,148,251)	\$11,727,961	\$58,567,763	\$147,474
Apr	(43,162,414)	\$13,172,564	\$56,678,480	\$26,688,630
May	(42,156,510)	\$8,445,825	\$58,567,763	\$24,857,079
Jun	16,514,654	\$23,815,782	\$38,583,670	\$78,914,106
Jul	24,445,242	\$35,064,490	\$39,869,792	\$99,379,524
Aug	(27,433,989)	(\$4,665,815)	\$39,869,792	\$7,769,988
Sep	(18,312,069)	\$1,807,355	\$38,583,670	\$22,078,956
Oct	(47,018,209)	(\$2,241,775)	\$39,869,792	(\$9,390,192)
Nov	(39,093,476)	(\$2,574,032)	\$38,583,670	(\$3,083,838)
Dec	(39,857,164)	\$341,603	\$39,869,792	\$354,231
Total	(220,251,603)	\$125,697,493	\$560,511,863	\$465,957,753

Auction Revenue Rights

ARRs are financial instruments that entitle the holder to receive revenues or to pay charges based on nodal price differences determined in the Annual FTR Auction.⁴⁵ These price differences are based on the bid prices of participants in the Annual FTR Auction which relate to their expectations about the level of congestion in the Day-Ahead Energy Market. The auction clears the set of feasible FTR bids which produce the highest net revenue. In other words, ARR revenues are a function of FTR auction participants' expectations of locational congestion price differences in the Day-Ahead Energy Market.

ARRs are available only as obligations (not options) and 24-hour products. ARRs are available to the nearest 0.1 MW. The ARR target allocation is equal to the product of the ARR MW and the price difference between sink and source from the Annual FTR Auction. An ARR value can be positive or negative depending on the price difference between sink and source, with a negative difference resulting in a liability for the holder. The ARR target allocation represents the revenue that an ARR holder should receive. ARR credits can be positive or negative and can range from zero to the ARR target allocation. If the combined net revenues from the Long Term, Annual and Monthly Balance of Planning Period FTR Auctions are greater than the sum of all ARR target allocations, ARRs are fully funded. If these revenues are less than

⁴⁵ These nodal prices are a function of the market participants' annual FTR bids and binding transmission constraints. An optimization algorithm selects the set of feasible FTR bids that produces the most net revenue.

the sum of all ARR target allocations, available revenue is proportionally allocated among all ARR holders.

When a new control zone is integrated into PJM, firm transmission customers in that control zone may choose to receive either an FTR allocation or an ARR allocation before the start of the Annual FTR Auction for two consecutive planning periods following their integration date. After the transition period, such participants receive ARRs from the annual allocation process and are not eligible for directly allocated FTRs. Network Service Users and Firm Transmission Customers cannot choose to receive both an FTR allocation and an ARR allocation. This selection applies to the participant's entire portfolio of ARRs that sink into the new control zone. During this transitional period, the directly allocated FTRs are reallocated as load shifts between LSEs within the transmission zone.

On June 1, 2011, the American Transmission Systems, Inc. (ATSI) Control Zone was integrated into PJM. Network Service Users and Firm Transmission Customers in the ATSI Control Zone participated in the 2011 to 2012 Annual ARR Allocation. For a transitional period, those customers that receive, and pay for, firm transmission service that sources or sinks in newly integrated PJM control zones may elect to receive a direct allocation of FTRs instead of an allocation of ARRs. This transitional period covers the succeeding two Annual FTR Auctions after the integration of the new zone into PJM.

Market Structure

ARRs have been available to network service and firm, point-to-point transmission service customers since June 1, 2003, when the annual ARR allocation was first implemented for the 2003 to 2004 planning period. The initial allocation covered the Mid-Atlantic Region and the AP Control Zone. For the 2006 to 2007 planning period, the choice of ARRs or direct allocation FTRs was available to eligible market participants in the AEP, DAY, DLCO and Dominion control zones. For the 2007 to 2008 and subsequent planning periods through the 2010 to 2011 planning period, all eligible market participants were allocated ARRs. For the 2011 to 2012 planning period, the choice of ARRs or direct allocation FTRs was available to eligible market participants in the ATSI control zone.

Supply and Demand

ARR supply is limited by the capability of the transmission system to simultaneously accommodate the set of requested ARRs and the numerous combinations of ARRs that are feasible. The top three binding transmission constraints for the 2011 to 2012 planning period can be seen in Figure 12-1.

ARR Allocation

For the 2007 to 2008 planning period, the annual ARR allocation process was revised to include Long Term ARRs that would be in effect for 10 consecutive planning periods.⁴⁶ Long Term ARRs can give LSEs the ability to hedge their congestion costs on a long-term basis by providing price certainty throughout the 10 planning period time frame. Long Term ARR holders can opt out of any planning period during the 10 planning period timeline and self schedule their Long Term ARRs as FTRs.

Each March, PJM allocates ARRs to eligible customers in a three-stage process:

- Stage 1A.** In the first stage of the allocation, network transmission service customers can obtain Long Term ARRs, up to their share of the zonal base load, after taking into account generation resources that historically have served load in each control zone and up to 50 percent of their historical nonzone network load. Nonzone network load is load that is located outside of the PJM footprint. Firm, point-to-point transmission service customers can obtain Long Term ARRs, based on up to 50 percent of the MW of long-term, firm, point-to-point transmission service provided between the receipt and delivery points for the historical reference year. Stage 1A ARR holders can also opt out of any planning period during the 10-planning-period timeline and self schedule their Long Term ARRs as FTRs. Stage 1A ARRs cannot be prorated. If Stage 1A ARRs are found to be infeasible, transmission system upgrades must be undertaken to maintain feasibility.⁴⁷
- Stage 1B.** ARRs unallocated in Stage 1A are available in the Stage 1B allocation. Network transmission service customers can obtain ARRs, up to their

share of the zonal peak load, based on generation resources that historically have served load in each control zone and up to 100 percent of their transmission responsibility for nonzone network load. Firm, point-to-point transmission service customers can obtain ARRs based on the MW of long-term, firm, point-to-point service provided between the receipt and delivery points for the historical reference year. These long-term point-to-point service agreements must also remain in effect for the planning period covered by the allocation.

- Stage 2.** The third stage of the annual ARR allocation is a three-step procedure, with one-third of the remaining system capability allocated in each step of the process. Network transmission service customers can obtain ARRs from any hub, control zone, generator bus or interface pricing point to any part of their aggregate load in the control zone or load aggregation zone for which an ARR was not allocated in Stage 1A or Stage 1B. Firm, point-to-point transmission service customers can obtain ARRs consistent with their transmission service as in Stage 1A and Stage 1B.

Prior to the start of the Stage 2 annual ARR allocation process, ARR holders can relinquish any portion of their ARRs resulting from the Stage 1A or Stage 1B allocation process, provided that all remaining outstanding ARRs are simultaneously feasible following the return of such ARRs.⁴⁸ Participants may seek additional ARRs in the Stage 2 allocation.

Effective for the 2015 to 2016 planning period, when residual zone pricing will be introduced, an ARR will default to sinking at the load settlement point, but the ARR holder may elect to sink their ARR at the physical zone instead.⁴⁹

ARRs can also be traded between LSEs, but these trades must be made before the first round of the Annual FTR Auction. Traded ARRs are effective for the full 12-month planning period.

When ARRs are allocated, all ARRs must be simultaneously feasible to ensure that the physical transmission system

⁴⁶ See the *2006 State of the Market Report* (March 8, 2007) for the rules of the annual ARR allocation process for the 2006 to 2007 and prior planning periods.

⁴⁷ See PJM, "Manual 6: Financial Transmission Rights" Revision 12 (July 1, 2009), p. 22.

⁴⁸ PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), pp. 21.

⁴⁹ See "Residual Zone Pricing," PJM Presentation to the Members Committee (February 23, 2012) <<http://www.pjm.com/~media/committees-groups/committees/mc/20120223/20120223-item-03-residual-zone-pricing-presentation.ashx>> The introduction of residual zone pricing, while approved by PJM members, depends on a FERC order.

can support the approved set of ARR. In making simultaneous feasibility determinations, PJM utilizes a power flow model of security-constrained dispatch that takes into account generation and transmission facility outages and is based on assumptions about the configuration and availability of transmission capability during the planning period.⁵⁰ This simultaneous feasibility requirement is necessary to ensure that there are sufficient revenues from transmission congestion charges to satisfy all resulting ARR obligations, thereby preventing underfunding of the ARR obligations for a given planning period. If the requested set of ARRs is not simultaneously feasible, customers are allocated prorated shares in direct proportion to their requested MW and in inverse proportion to their impact on binding constraints:

Equation 12-1 Calculation of prorated ARRs

Individual prorated MW = (Constraint capability) X (Individual requested MW / Total requested MW) X (1 / MW effect on line).⁵¹

The effect of an ARR request on a binding constraint is measured using the ARR's power flow distribution factor. An ARR's distribution factor is the percent of each requested MW of ARR that would have a power flow on the binding constraint. The PJM methodology prorates ARR requests in proportion to their MW value and the impact on the binding constraint. PJM's method results in the prorating of ARRs that cause the greatest flows on the binding constraint instead of those that produce less flow on it. Were all ARR requests prorated equally, irrespective of their proportional impact on the binding constraints, the result would be a significant reduction in market participants' ARRs even when they have little impact on the binding constraints and the reduced allocation of ARRs, and their associated benefits, with primary impacts on unrelated constraints.

Table 12-26 lists the top 10 principal binding constraints, along with their corresponding control zones in order of severity that limited supply in the annual ARR allocation for the 2011 to 2012 planning period. The order of severity is determined by the violation degree of the binding constraint as computed in the simultaneous

feasibility test.⁵² The violation degree is a measure of the MW that a constraint is over the limit.

Table 12-26 Top 10 principal binding transmission constraints limiting the annual ARR allocation: Planning period 2011 to 2012

Constraint	Type	Control Zone
South Mahwah - Waldwick	Line	PSEG
East Frankfort - Crete	Line	ComEd
Crete - St Johns Tap	Flowgate	MISO
Linden - North Ave	Line	PSEG
Bayonne - PVSC	Line	PSEG
Electric Junction - Nelson	Line	MISO
Bayonne - Marion	Line	PSEG
Pleasant Valley - Belvidere	Line	ComEd
East Sayre - North Waverly	Line	PENELEC
Breed - Wheatland	Line	AEP

Residual ARRs

Only ARR holders that had their Stage 1A or Stage 1B ARRs prorated are eligible to receive residual ARRs. Residual ARRs are available if additional transmission system capability is added during the planning period after the annual ARR allocation. This additional transmission system capability would not have been accounted for in the initial annual ARR allocation, but it enables the creation of residual ARRs. Residual ARRs are effective on the first day of the month in which the additional transmission system capability is included in FTR auctions and exist until the end of the planning period. For the following planning period, any residual ARRs are available as ARRs in the annual ARR allocation. Stage 1 ARR holders have a priority right to ARRs. Residual ARRs are a separate product from incremental ARRs. No residual ARRs have been allocated to date.

Incremental ARRs

Market participants constructing generation interconnection or transmission expansion projects may request an allocation of incremental ARRs based on the resultant increase in transmission capability.⁵³ Incremental ARRs are available in a three-round allocation process with a single point-to-point combination requested and one-third of the incremental ARR MW allocated in each round. Incremental ARRs can be accepted or refused after rounds one and two.

⁵⁰ PJM. "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), pp. 54-55.

⁵¹ See the *MMU Technical Reference for PJM Markets*, at "Financial Transmission Rights and Auction Revenue Rights," for an illustration explaining this calculation in greater detail.

⁵² See PJM. "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), pp. 54-55.

⁵³ PJM. "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 30.

Incremental ARRs are effective for the lesser of 30 years or the life of the facility or upgrade. At any time during this 30-year period, the participant has a single opportunity to replace the allocated ARRs with a right to request ARRs during the annual ARR allocation process between the same source and sink. Such participants can also permanently relinquish their incremental ARRs at any time during the life of the ARRs as long as overall the system simultaneous feasibility can be maintained.

Table 12-27 lists the incremental ARR allocation volume for the 2008 to 2009, 2009 to 2010, 2010 to 2011 and the 2011 to 2012 planning periods. For the 2011 to 2012 planning period, there were requests for 595 MW and 100 percent of the bids were cleared. For the 2010 to 2011 planning period, there were bids for 531 MW and 100 percent of the bids were cleared.

Table 12-27 Incremental ARR allocation volume: Planning periods 2008 to 2009, 2009 to 2010, 2010 to 2011 and 2011 to 2012

Planning Period	Bid and Requested		Cleared		Uncleared	
	Requested Count	Volume (MW)	Volume (MW)	Cleared Volume	Volume (MW)	Uncleared Volume
2008/2009	15	891	891	100%	0	0%
2009/2010	14	531	531	100%	0	0%
2010/2011	14	531	531	100%	0	0%
2011/2012	15	595	595	100%	0	0%

Table 12-28 IARRs allocated for 2011 to 2012 Annual ARR Allocation for RTEP upgrades⁵⁴

Project #	Project Description	IARR Parameters		
		Source	Sink	Total MW
B0287	Install 600 MVAR Dynamic Reactive Device at Elroy 500kV	RTEP B0287 Source	DPL	190.6
B0328	TrAIL Project: 502 JCT - Loudoun 500kV	RTEP B0328 Source	Pepco	391.2
B0329	Cason-Suffolk 500 kV	RTEP B0329 Source	Dominion	96.4

Incremental ARRs (IARRs) for RTEP Upgrades

IARRs are allocated to customers that have been assigned cost responsibility for certain upgrades included in the PJM's Regional Transmission Expansion Plan (RTEP). These customers as defined in Schedule 12 of the Tariff are network service customers and/or merchant transmission facility owners that are assigned the cost responsibility for upgrades included in the PJM RTEP. PJM calculates IARRs for each Regionally Assigned Facility and allocates the IARRs, if any are created by the upgrade, to eligible customers based on their percentage of cost responsibility. The customers may choose to decline the IARR allocation during the annual ARR allocation process.⁵⁵ Each network service customer within a zone is allocated a share of the IARRs in the zone based on their share of the network service peak load of the zone. For the annual ARR allocation for the 2011/2012 planning period, 678.2 total MW of IARRs were allocated for RTEP upgrades. Table 12-28 lists the three RTEP upgrade projects that were allocated IARRs.

⁵⁴ RTEP B0287 Source is a new aggregate comprised of an equal ten percent weighting of the following ten nodes: MUDDYRN 13 KV Unit1, MUDDYRN 13 KV Unit2, MUDDYRN 13 KV Unit3, MUDDYRN 13 KV Unit4, MUDDYRN 13 KV Unit5, MUDDYRN 13 KV Unit6, MUDDYRN 13 KV Unit7, MUDDYRN 13 KV Unit8, PEACHBOT 22 KV UNIT02 and PEACHBOT 22 KV UNIT03.

⁵⁵ PJM. "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), pp. 31 and "IARRs for RTEP Upgrades Allocated for 2011/2012 Planning Period," <<http://www.pjm.com/~media/markets-ops/ft/annual-arr-allocation/2011-2012/iarrs-rtep-upgrades-allocated-for-2011-12-planning-period.aspx>>.

ARR Reassignment for Retail Load Switching

Current PJM rules provide that when load switches between LSEs during the planning period, a proportional share of associated ARR that sink into a given control or load aggregation zone is automatically reassigned to follow that load.⁵⁶ ARR reassignment occurs daily only if the LSE losing load has ARRs with a net positive economic value to that control zone. An LSE gaining load in the same control zone is allocated a proportional share of positively valued ARRs within the control zone based on the shifted load. ARRs are reassigned to the nearest 0.001 MW and any MW of load may be reassigned multiple times over a planning period. Residual ARRs are also subject to the rules of ARR reassignment. This practice supports competition by ensuring that the offset to congestion follows load, thereby removing a barrier to competition among LSEs and, by ensuring that only ARRs with a positive value are reassigned, preventing an LSE from assigning poor ARR choices to other LSEs. However, when ARRs are self scheduled as FTRs, these underlying self scheduled FTRs do not follow load that shifts while the ARRs do follow load that shifts, and this may diminish the value of the ARR for the receiving LSE compared to the total value held by the original ARR holder.

The MMU recommends that when load switches between LSEs during the planning period, a proportional share of the underlying self scheduled FTRs follow the load in the same manner that ARRs do. ARRs are assigned to firm transmission service customers because these customers pay the costs of the transmission system that enables firm energy delivery. At the time of the FTR Annual Auction, ARR holders have the ability to acquire FTRs by choosing to self schedule in the annual FTR auction. When load switches among LSEs during the planning period, the LSE gaining load is reassigned its proportional share of the ARRs from the LSE losing load. After the Annual FTR Auction has occurred, the LSE gaining load does not have the ability to self schedule FTRs associated with the reassigned ARRs. The self scheduled FTRs are obtained as the direct result of the ARR assignment and should therefore follow the reassignment of ARRs when load switches in order to ensure that the new LSE is in the same competitive position as the LSE that lost load.

Table 12-29 summarizes ARR MW and associated revenue automatically reassigned for network load in each control zone where changes occurred between June 2010 and December 2011. About 24,531 MW of ARRs associated with \$388,700 per MW-day of revenue were automatically reassigned in the first seven months of the 2010 to 2011 planning period. About 56,296 MW of ARRs with \$1,043,700 per MW-day of revenue were reassigned for the entire 12-month 2010 to 2011 planning period.

Table 12-29 ARRs and ARR revenue automatically reassigned for network load changes by control zone: June 1, 2010, through December 31, 2011

Control Zone	ARRs Reassigned (MW-day)		ARR Revenue Reassigned [Dollars (Thousands) per MW-day]	
	2010/2011 (12 months)	2011/2012 (7 months)*	2010/2011 (12 months)	2011/2012 (7 months)*
AECO	887	345	\$6.0	\$3.7
AEP	961	3,333	\$21.4	\$65.6
AP	4,992	961	\$481.1	\$87.1
ATSI	0	2,474	\$0.0	\$10.7
BGE	3,359	2,117	\$50.5	\$37.3
ComEd	3,064	2,271	\$60.2	\$40.3
DAY	193	318	\$0.6	\$0.5
DLCO	5,502	2,172	\$25.7	\$7.9
DPL	2,252	1,364	\$20.4	\$12.2
Dominion	0	1	\$0.0	\$0.0
JCPL	3,490	802	\$28.8	\$7.3
Met-Ed	3,947	877	\$51.9	\$15.3
PECO	12,284	1,291	\$89.2	\$15.5
PENELEC	3,745	803	\$53.5	\$16.3
PPL	5,734	2,518	\$74.4	\$28.7
PSEG	3,416	1,235	\$52.8	\$20.4
Pepco	2,470	1,649	\$27.3	\$20.0
RECO	143	46	\$0.1	\$0.0
Total	56,296	24,531	\$1,043.7	\$388.7

* Through 31-Dec-11

Market Performance

Volume

Table 12-30 lists the annual ARR allocation volume by stage and round for the 2010 to 2011 and the 2011 to 2012 planning periods. For the 2011 to 2012 planning period, there were 64,160 MW (43.2 percent of total demand) bid in Stage 1A, 22,208 MW (18.4 percent of total demand) bid in Stage 1B and 57,053 MW (38.4 percent of total demand) bid in Stage 2. Of 148,538 MW in total ARR requests 64,160 MW were allocated in Stage 1A and 22,208 MW were allocated in Stage 1B while 16,108 MW were allocated in Stage 2 for a total of 102,476 MW (69.0 percent) allocated. Eligible

⁵⁶ See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 28.

market participants subsequently converted 46,017 MW of these allocated ARRs into Annual FTRs (44.9 percent of total allocated ARRs), leaving 56,459 MW of ARRs outstanding. For the 2010 to 2011 planning period, there had been 61,793 MW (45.6 percent of total demand) bid in Stage 1A 27,850 MW (20.5 percent of total demand) bid in Stage 1B and 45,971 MW (33.9 percent of total demand) bid in Stage 2. Of 135,614 MW in total ARR requests, 61,793 MW were allocated in Stage 1A and 27,850 MW were allocated in Stage 1B while 12,200 MW were allocated in Stage 2 for a total of 101,842 MW (75.1 percent) allocated. There were 46,017 MW or 54.7 percent of the allocated ARRs converted into FTRs. ARR holders did not relinquish any ARRs for the 2010 to 2011 or the 2011 to 2012 planning period.

On June 1, 2011, the American Transmission Systems, Inc. (ATSI) Control Zone was integrated into PJM. Network Service Users and Firm Transmission Customers in the ATSI Control Zone participated in the Annual ARR Allocation and the Annual FTR Auction for the 2011 to 2012 planning period.

Table 12-31 separately lists the ARR volume for the ATSI Control Zone, which is included in the 2011 to 2012 ARR allocation volume in Table 12-30. Table 12-32 lists the directly allocated FTR volume for the 2011 to 2012 planning period for the ATSI Control Zone, which is not included in the data in Table 12-30 and Table 12-31.

Revenue

As ARRs are allocated to qualifying customers rather than sold, there is no ARR revenue comparable to the revenue that results from the FTR auctions.

Revenue Adequacy

As with FTRs, revenue adequacy for ARRs must be distinguished from the adequacy of ARRs as an offset to congestion. Revenue adequacy is a narrower concept that compares the revenues available to ARR holders to the value of ARRs as determined in the Annual FTR Auction. ARRs have been revenue adequate for every auction to date. Customers that self schedule ARRs as FTRs have the same revenue adequacy characteristics as all other FTRs.

The adequacy of ARRs as an offset to congestion compares ARR revenues to total congestion sinking in

the participant's load zone as a measure of the extent to which ARRs offset market participants' actual, total congestion into their zone. Customers that self schedule ARRs as FTRs provide the same offset to congestion as all other FTRs.

ARR holders will receive \$947.3 million in credits from the Annual FTR Auction during the 2011 to 2012 planning period, with an average hourly ARR credit of \$1.05 per MW. During the comparable 2010 to 2011 planning period, ARR holders received \$1,028.8 million in ARR credits, with an average hourly ARR credit of \$1.15 per MW.

Table 12-33 lists ARR target allocations and net revenue sources from the Annual and Monthly Balance of Planning Period FTR Auctions for the 2010 to 2011 and the 2011 to 2012 (through December 31, 2011) planning periods. Annual FTR Auction net revenue has been sufficient to cover ARR target allocations for both planning periods. The 2011 to 2012 planning period's Annual and Monthly Balance of Planning Period FTR Auctions generated a surplus of \$104.5 million in auction net revenue through December 31, 2011, above the amount needed to pay 100 percent of ARR target allocations. The entire 2010 to 2011 planning period's Annual and Monthly Balance of Planning Period FTR Auctions generated a surplus of \$45.5 million in auction net revenue, above the amount needed to pay 100 percent of ARR target allocations.

Table 12-30 Annual ARR allocation volume: Planning periods 2010 to 2011 and 2011 to 2012

Planning Period	Stage	Round	Requested Count	Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
2010/2011	1A	0	8,862	61,793	61,793	100.0%	0	0.0%
	1B	1	3,885	27,850	27,850	100.0%	0	0.0%
	2	2	1,901	15,333	4,160	27.1%	11,173	72.9%
	3		1,374	15,321	4,167	27.2%	11,154	72.8%
	4		1,247	15,317	3,872	25.3%	11,445	74.7%
	Total		4,522	45,971	12,199	26.5%	33,772	73.5%
Total			17,269	135,614	101,842	75.1%	33,772	24.9%
2011/2012	1A	0	12,654	64,160	64,160	100.0%	0	0.0%
	1B	1	7,660	27,325	22,208	81.3%	5,117	18.7%
	2	2	3,498	20,321	3,072	15.1%	17,249	84.9%
	3		2,593	18,538	6,653	35.9%	11,885	64.1%
	4		2,080	18,194	6,383	35.1%	11,811	64.9%
	Total		8,171	57,053	16,108	28.2%	40,945	71.8%
Total			28,485	148,538	102,476	69.0%	46,062	31.0%

Table 12-31 ARR volume for ATSI Control Zone: 2011 to 2012 planning period⁵⁷

Planning Period	Requested Count	Bid and Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
2011/2012	1,309	5,434	2,770	51%	2,663	49%

Table 12-32 Direct allocation of FTR volume for ATSI Control Zone: 2011 to 2012 planning period⁵⁸

Planning Period	Bid and Requested Count	Bid and Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
2011/2012	114	7,750	4,189	54%	3,561	46%

Table 12-33 ARR revenue adequacy (Dollars (Millions)): Planning periods 2010 to 2011 and 2011 to 2012

	2010/2011	2011/2012
Total FTR auction net revenue	\$1,074.3	\$1,051.8
Annual FTR Auction net revenue	\$1,049.8	\$1,029.6
Monthly Balance of Planning Period FTR Auction net revenue*	\$24.5	\$22.1
ARR target allocations	\$1,028.8	\$947.3
ARR credits	\$1,028.8	\$947.3
Surplus auction revenue	\$45.5	\$104.5
ARR payout ratio	100%	100%
FTR payout ratio*	85.0%	84.9%

* Shows twelve months for 2010/2011 and seven months ended 31-Dec-11 for 2011/2012

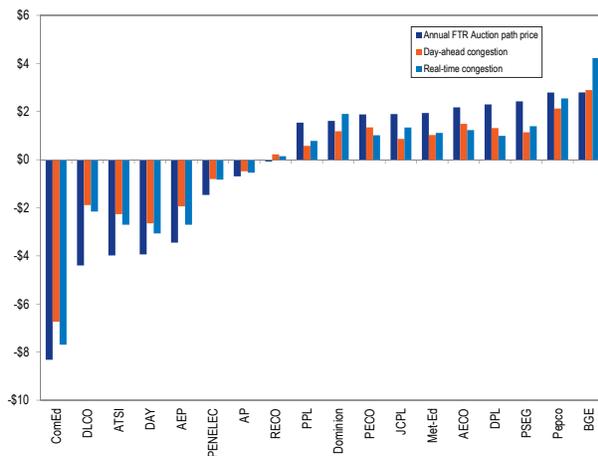
⁵⁷ The 2011 to 2012 ARR volume data in Table 12-31 are included in the 2011 to 2012 ARR allocation data in Table 12-30.

⁵⁸ The 2011 to 2012 directly allocated FTR volume data in Table 12-32 are not included in ARR allocation data in Table 12-30.

ARR and FTR Revenue and Congestion FTR Prices and Zonal Price Differences

As an illustration of the relationship between FTRs and congestion, Figure 12-16 shows Annual FTR Auction prices and an approximate measure of day-ahead and real-time congestion for each PJM control zone for the 2011 to 2012 planning period through December 31, 2011. The day-ahead and real-time congestion are based on the difference between zonal congestion prices and Western Hub congestion prices. The figure shows, for example, that an FTR from the Western Hub to the PECO Control Zone cost \$1.88 per MW in the Annual FTR Auction and that about \$1.34 per MW of day-ahead congestion and \$1.02 per MW of real-time congestion existed between the Western Hub and the PECO Control Zone. The data shows that congestion costs, approximated in this way, were positive for most control zones located east of the Western Hub while congestion costs were negative and were more negative than the price of FTRs for control zones that are located west of that Hub.

Figure 12-16 Annual FTR Auction prices vs. average day-ahead and real-time congestion for all control zones relative to the Western Hub: Planning period 2011 to 2012 through December 31, 2011



Effectiveness of ARRs as an Offset to Congestion

One measure of the effectiveness of ARRs as an offset to congestion is a comparison of the revenue received by the holders of ARRs and the congestion paid by the holders of ARRs in both the Day-Ahead Energy Market and the Balancing Energy Market. The revenue which serves as an offset for ARR holders comes from the FTR auctions while the revenue for FTR holders is provided by the congestion payments from the Day-Ahead Energy Market and the balancing energy market.

The comparison between the revenue received by ARR holders and the actual congestion experienced by these ARR holders in the Day-Ahead Energy Market and the balancing energy market is presented by control zone in Table 12-34. ARRs and self scheduled FTRs that sink at an aggregate are assigned to a control zone if applicable.⁵⁹ Total revenue equals the ARR credits and the FTR credits from ARRs which are self scheduled as FTRs. The ARR credits do not include the ARR credits for the portion of any ARR that was self scheduled as an FTR since ARR holders purchase self scheduled FTRs in the Annual FTR Auction and that revenue is then paid back to the ARR holders, netting the transaction to zero. ARR credits are calculated as the product of the ARR MW (excludes any self scheduled FTR MW) and the cleared price for the ARR path from the Annual FTR Auction.

FTR credits equal FTR target allocations adjusted by the FTR payout ratio. The FTR target allocation is equal to the product of the FTR MW and the congestion price differences between sink and source that occur in the Day-Ahead Energy Market. FTR credits are paid to FTR holders and may be less than the target allocation. The FTR payout ratio was 85.0 percent of the target allocation for the 2010 to 2011 planning period.

The “Congestion” column shows the amount of congestion in each control zone from the Day-Ahead Energy Market and the balancing energy market and includes only the congestion costs incurred by the organizations that hold ARRs or self scheduled FTRs. The last column shows the difference between the total

⁵⁹ For Table 12-34 through Table 12-36, aggregates are separated into their individual bus components and each bus is assigned to a control zone. The “External” Control Zone includes all aggregate sinks that are external to PJM or buses that cannot otherwise be assigned to a specific control zone.

revenue and the congestion for each ARR control zone sink.

Data shown are for the 2010 to 2011 planning period summed by ARR control zone sink. For example, the table shows that for the 2010 to 2011 planning period, ARRs allocated to the AEP Control Zone received a total of \$167.4 million in revenue which was the sum of \$8.9 million in ARR credits and \$158.5 million in credits for self scheduled FTRs. This total revenue was \$13.3 million more than the congestion costs of \$154.1 million from the Day-Ahead Energy Market and the balancing energy market incurred by organizations in the AEP Control Zone that held ARRs or self scheduled FTRs.

Table 12-34 ARR and self scheduled FTR congestion offset by control zone: Planning period 2010 to 2011⁶⁰

Control Zone	ARR Credits	Self-Scheduled FTR Credits	Total Revenue	Congestion	Total Revenue - Congestion Difference	Percent Offset
AECO	\$5,622,487	\$1,343,102	\$6,965,589	\$50,197,949	(\$43,232,360)	13.9%
AEP	\$8,853,266	\$158,525,251	\$167,378,517	\$154,078,263	\$13,300,254	>100%
AP	\$35,547,112	\$309,621,694	\$345,168,806	\$93,793,206	\$251,375,600	>100%
BGE	\$29,986,713	\$4,699,497	\$34,686,210	\$57,667,097	(\$22,980,887)	60.1%
ComEd	\$82,312,055	\$0	\$82,312,055	(\$445,029,277)	\$527,341,332	>100%
DAY	\$3,657,086	\$2,458,208	\$6,115,294	\$1,343,413	\$4,771,881	>100%
DLCO	\$5,052,309	\$0	\$5,052,309	\$15,986,068	(\$10,933,759)	31.6%
Dominion	\$4,991,988	\$218,489,082	\$223,481,070	\$52,277,661	\$171,203,409	>100%
DPL	\$11,862,147	\$1,710,585	\$13,572,732	\$69,885,719	(\$56,312,987)	19.4%
External	\$17,922,362	\$3,848,221	\$21,770,583	\$31,670,378	(\$9,899,795)	68.7%
JCPL	\$15,966,799	\$3,576,591	\$19,543,390	\$81,656,204	(\$62,112,814)	23.9%
Met-Ed	\$13,272,652	\$839,385	\$14,112,037	\$46,306,545	(\$32,194,508)	30.5%
PECO	\$1,707,188	\$41,316,229	\$43,023,417	\$13,485,128	\$29,538,289	>100%
PENELEC	\$23,696,177	\$15,555	\$23,711,732	\$65,814,675	(\$42,102,943)	36.0%
Pepco	\$20,673,905	\$2,127,390	\$22,801,295	\$141,816,079	(\$119,014,784)	16.1%
PPL	\$20,247,335	\$6,027,176	\$26,274,511	\$121,317,654	(\$95,043,143)	21.7%
PSEG	\$38,443,990	\$8,904,604	\$47,348,594	\$29,296,535	\$18,052,059	>100%
RECO	\$93,249	\$0	\$93,249	\$4,303,141	(\$4,209,892)	2.2%
Total	\$339,908,820	\$763,502,571	\$1,103,411,391	\$585,866,438	\$517,544,953	>100%

During the 2010 to 2011 planning period, congestion costs associated with the 102,046 MW of allocated ARRs were \$585.9 million. As Table 12-10 indicates, 55,732 MW of ARRs were converted into FTRs through the self scheduling option, with 46,314 MW remaining as ARRs. The 46,314 MW of remaining ARRs provided \$339.9 million of ARR credits, while the self scheduled FTRs provided \$763.5 million of revenue. Total congestion was fully offset by the combination of ARRs and self scheduled FTRs (Table 12-34). The effectiveness of ARRs as an offset depends on the ARR values, FTR values for

self scheduled FTRs, congestion patterns in the Day-Ahead Energy Market and the balancing energy market, and the FTR payout ratio.

Effectiveness of ARRs and FTRs as an Offset to Congestion

Table 12-35 compares the revenue for ARR and FTR holders and the congestion in both the Day-Ahead Energy Market and the balancing energy market for the 2010 to 2011 planning period. This compares the total offset provided by all ARRs and all FTRs to the total congestion costs within each control zone. ARRs and FTRs that sink at an aggregate or a bus are assigned to a control zone if applicable. ARR credits are calculated as the product of the ARR MW and the cleared price of the ARR path from the Annual FTR Auction. The

“FTR Credits” column represents the total FTR target allocation for FTRs that sink in each control zone from the applicable FTRs from the Long Term FTR Auction, Annual FTR Auction, the Monthly Balance of Planning Period FTR Auctions, and any FTRs that were self scheduled from ARRs, adjusted by the FTR payout ratio. The FTR target allocation is equal to the product of the FTR MW and congestion price differences between sink and source that occur in the Day-Ahead Energy Market. FTR credits are the product of the FTR target allocations and the FTR payout ratio. The FTR payout ratio was 85.0 percent of the target allocation for the 2010 to 2011 planning period. The “FTR Auction Revenue” column shows the amount paid for FTRs that sink in each control

⁶⁰ The “External” zone was labeled as “PJM” in previous State of the Market Reports. The name was changed to “External” to clarify that this component of congestion is accrued on energy flows between external buses and PJM interfaces.

zone from the applicable FTRs from the Long Term FTR Auction, the Annual FTR Auction, the Monthly Balance of Planning Period FTR Auctions and any ARRs that were self scheduled as FTRs. ARR holders that self schedule FTRs purchased the FTRs in the Annual FTR Auction and that revenue was then paid back to those ARR holders through ARR credits on a monthly basis throughout the planning period, ultimately netting the transaction to zero. The total ARR and FTR hedge is the sum of the ARR credits and the FTR credits minus the FTR auction revenue. The “Congestion” column shows the total amount of congestion in the Day-Ahead Energy Market and the Balancing Energy Market in each control zone.⁶¹ The last column shows the difference between the total ARR and FTR hedge and the congestion cost for each control zone.

For example, the table shows that all ARRs and FTRs that sink in the AP Control Zone received \$308.4 million in ARR credits and \$323.6 million in FTR credits. After subtracting the cost of the FTRs, the FTR auction revenue of \$266.8 million, the total ARR and FTR offset was \$365.1 million. The total value of the ARRs and FTRs was \$92.8 million higher than the \$272.4 million of congestion in the Day-Ahead Energy Market and the Balancing Energy Market.

The results in Table 12-36 indicate that the value of ARRs and FTRs together offset 97.3 percent of total congestion costs. During the 2010 to 2011 planning period, the 101,843 MW of cleared ARRs produced \$1,029.3 million of ARR credits while the total of all FTR credits was \$1,431.9 million. When calculating the total ARR and FTR offset, the cost to obtain the FTRs must be subtracted from the total ARR and FTR revenue. This cost is the sum of the FTR auction revenues, which was \$1,097.8 million for the 2010 to 2011 planning period. The value of ARRs and FTRs was \$1,363.3 million after accounting for costs, which is less than the \$1,406.1 million of congestion in the Day-Ahead Energy Market and the Balancing Energy Market.

Table 12-36 shows that for the 2010 to 2011 planning period, the total value of the ARR and FTR positions was \$45.4 million less than the total congestion within

PJM.⁶² All ARRs and FTRs offset 97.3 percent of the total congestion costs in the Day-Ahead Energy Market and the Balancing Energy Market within PJM. For the first seven months of the 2011 to 2012 planning period, the FTR payout ratio was 84.9 percent of the target allocation. All ARRs and FTRs covered greater than 100 percent of the total congestion costs within PJM for the first seven months of the 2011 to 2012 planning period. The total value of the ARR and FTR positions was greater than the cost of congestion by \$44.2 million.

⁶¹ The total zonal congestion numbers were calculated as of March 2, 2012 and may change as a result of continued PJM billing updates. The total zonal congestion differs from the March 2, 2012 PJM total congestion by \$4.2 Million, or 0.3 percent (.003).

⁶² The numbers presented here are PJM's total congestion costs for the 2010-2011 planning year and the first seven months of the 2011-2012 planning year, calculated as of March 2, 2012.

Table 12-35 ARR and FTR congestion offset by control zone: Planning period 2010 to 2011

Control Zone	ARR Credits	FTR Credits	FTR Auction Revenue	Total ARR and FTR Offset	Congestion	Total Offset - Congestion Difference	Percent Offset
AECO	\$6,095,482	\$15,356,788	\$8,369,233	\$13,083,037	\$34,090,353	(\$21,007,316)	38.4%
AEP	\$194,446,396	\$194,595,085	\$191,920,958	\$197,120,523	\$175,041,297	\$22,079,227	>100%
AP	\$308,392,416	\$323,569,671	\$266,825,782	\$365,136,305	\$272,379,630	\$92,756,674	>100%
BGE	\$33,678,997	\$76,071,503	\$47,988,952	\$61,761,548	\$83,727,088	(\$21,965,540)	73.8%
ComEd	\$91,566,097	\$104,050,751	\$81,016,415	\$114,600,433	\$266,104,165	(\$151,503,732)	43.1%
DAY	\$5,788,157	\$2,228,889	\$1,857,768	\$6,159,278	\$5,209,352	\$949,926	>100%
DLCO	\$5,052,309	\$4,342,645	(\$4,464,852)	\$13,859,806	\$269,563,349	(\$255,703,542)	5.1%
Dominion	\$176,257,284	\$255,309,914	\$183,744,171	\$247,823,027	\$53,782,364	\$194,040,663	>100%
DPL	\$12,954,039	\$28,003,826	\$21,098,243	\$19,859,622	\$22,397,356	(\$2,537,734)	88.7%
External	\$20,706,621	(\$4,725,192)	(\$7,470,423)	\$23,451,852	(\$25,134,091)	\$48,585,943	>100%
JCPL	\$18,916,958	\$50,076,625	\$22,815,912	\$46,177,671	\$63,099,463	(\$16,921,792)	73.2%
Met-Ed	\$13,935,697	\$18,983,528	\$8,126,867	\$24,792,358	\$3,088,074	\$21,704,285	>100%
PECO	\$23,365,352	\$62,384,191	\$30,955,754	\$54,793,789	(\$4,607,904)	\$59,401,692	>100%
PENELEC	\$23,704,470	\$61,042,705	\$30,722,474	\$54,024,701	\$91,672,220	(\$37,647,520)	58.9%
Pepco	\$22,895,504	\$126,337,038	\$124,122,586	\$25,109,956	\$92,132,782	(\$67,022,825)	27.3%
PPL	\$27,383,200	\$29,847,535	\$17,822,265	\$39,408,470	\$730,025	\$38,678,445	>100%
PSEG	\$44,042,817	\$86,676,270	\$73,683,481	\$57,035,606	(\$4,896,944)	\$61,932,550	>100%
RECO	\$93,249	(\$2,241,262)	(\$1,299,731)	(\$848,282)	\$3,487,775	(\$4,336,057)	0.0%
Total	\$1,029,275,045	\$1,431,910,509	\$1,097,835,855	\$1,363,349,699	\$1,401,866,354	(\$38,516,655)	97.3%

Table 12-36 ARR and FTR congestion hedging: Planning periods 2010 to 2011 and 2011 to 2012⁶³

Planning Period	ARR Credits	FTR Credits	FTR Auction Revenue	Total ARR and FTR Offset	Congestion	Total Offset - Congestion Difference	Percent Offset
2010/2011	\$1,029,275,045	\$1,431,910,509	\$1,097,835,855	\$1,363,349,699	\$1,401,866,354	(\$38,516,655)	97.3%
2011/2012*	\$574,710,238	\$672,731,759	\$639,143,012	\$608,298,984	\$564,122,663	\$44,176,321	>100%

* Shows seven months ended 31-Dec-11

⁶³ The FTR credits do not include after-the-fact adjustments. For the 2011 to 2012 planning period, the ARR credits were the total credits allocated to all ARR holders for the first seven months (June through December 2011) of this planning period, and the FTR Auction Revenue includes the net revenue in the Monthly Balance of Planning Period FTR Auctions for the first seven months of this planning period and the portion of Annual FTR Auction revenue distributed to the first seven months.