

## 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 (FTRs) 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.<sup>1</sup> 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.<sup>2</sup>

In PJM, Financial Transmission Rights (FTRs) were part of the market design, and 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.<sup>3</sup>

Effective June 1, 2003, PJM replaced the allocation of FTRs with an allocation of Auction Revenue Rights (ARRs) and an associated Annual FTR Auction.<sup>4,5</sup> 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. As a result, the meaning of FTRs in PJM is different from the meaning of FTRs in other ISOs and RTOs that have only FTRs but no ARRs. In PJM, the separation of ARRs and FTRs meant that FTRs were provided as a market enhancement for market participants that did not serve load and did not receive an allocation of FTRs. But FTRs now no longer represent the financial equivalent of physical rights associated with the transmission system. That is what ARRs represent. There is no obligation to provide a specific level of FTRs, in excess of the level of ARRs, and there is no obligation to ensure that FTRs receive any specific level of revenue. FTRs are now a market product and the value of FTRs to market participants will be reflected in the price participants are willing to pay for them.

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 and FTR holders do not have the right to revenue adequacy.

The *2012 State of the Market Report for PJM* focuses on the Long Term FTR Auctions, the Annual FTR Auctions and the Monthly Balance of Planning Period

<sup>1</sup> See 81 FERC ¶ 61,257, at 62,241 (1997).

<sup>2</sup> See *id.* at 62, 259–62,260 & n. 123.

<sup>3</sup> *Id.*

<sup>4</sup> 102 FERC ¶ 61,276 (2003).

<sup>5</sup> 87 FERC ¶ 61,054 (1999).

FTR Auctions during the 2012 to 2013 planning period, which covers January 1, 2012, through December 31, 2013.

**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.
- 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. Nonetheless there is a growing issue with FTR revenue sufficiency.

## Overview

### Financial Transmission Rights

#### Market Structure

- **Supply.** The principal binding constraints limiting the supply of FTRs in the 2013 to 2016 Long Term FTR Auction include the Gainesville Transformer, approximately 40 miles west of Washington, D.C., and the Monticello – East Winamac Flowgate, approximately 120 miles north of Indianapolis, IN. The principal binding constraints limiting the supply of FTRs in the Annual FTR Auction for the 2012 to 2013 planning period include the Cumberland Ave – Bush Flowgate, approximately 100 miles northwest of Indianapolis, IN and the Stephenson – Stonewall Flowgate, approximately 100 miles northwest of Washington, D.C. The geographic location of these constraints is shown in Figure 12-1.

Market participants can also sell FTRs. In the 2013 to 2016 Long Term FTR Auction, total participant

FTR sell offers were 211,316 MW, down from 251,290 MW during the 2012 to 2015 Long Term FTR Auction. In the Annual FTR Auction for the 2012 to 2013 planning period, total participant FTR sell offers were 356,299 MW, up from 337,510 MW during the 2011 to 2012 Annual FTR Auction. In the Monthly Balance of Planning Period FTR Auctions for the first seven months (June through December 2012) of the 2012 to 2013 planning period, total participant FTR sell offers were 3,589,825 MW, down from 3,984,782 MW for the same period during the 2011 to 2012 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.<sup>6</sup> 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 2013 to 2016 Long Term FTR Auction, total FTR buy bids increased 15.5 percent from 2,400,881 MW to 2,772,621 MW. In the Annual FTR Auction total FTR buy bids and self-scheduled bids decreased 21.4 percent from 3,260,695 MW to 2,561,835 MW. The total FTR buy bids from the Monthly Balance of Planning Period FTR Auctions for the first seven months of the 2012 to 2013 (June through December 2012) planning period increased 16.8 percent from 12,767,075 MW for the same time period of the prior planning period, to 14,906,684 MW.
- **Patterns of Ownership.** The ownership concentration of cleared FTR buy bids resulting from the 2012 to 2013 Annual FTR Auction was low for peak and off peak FTR obligations and moderately concentrated for 24-hour FTR obligations. The ownership concentration was also moderately concentrated 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 descriptive and is not a measure of the competitiveness of FTR market structure as the ownership positions resulted from a competitive auction.

<sup>6</sup> OA Schedule 1 § 7.3.5(d).

For the 2013 through 2016 Long Term FTR Auction, financial entities purchased 80.4 percent of prevailing flow FTRs and 91.9 percent of counter flow FTRs. In the Annual FTR Auction, planning period 2012 through 2013, financial entities purchased 55.8 percent of prevailing flow FTRs and 77.8 percent of counter flow FTRs. For the Monthly Balance of Planning Period Auctions, financial entities purchased 81.1 percent of prevailing flow and 84.6 percent of counter flow FTRs for 2012. Financial entities owned 62.8 percent of all prevailing and counter flow FTRs, including 54.4 percent of all prevailing flow FTRs and 80.1 percent of all counter flow FTRs during the same time period.

### Market Behavior

- **FTR Forfeitures.** Total forfeitures for the first seven months of the 2012 to 2013 planning period were \$398,630.
- **Credit Issues.** Twenty participants defaulted during 2012 from twenty one default events. The average of these defaults was \$381,772 with nine based on inadequate collateral and eleven based on nonpayment. The average collateral default was \$790,300 and the average nonpayment default was \$47,522. The majority of these defaults were promptly cured. These defaults were not necessarily related to FTR positions.

### Market Performance

- **Volume.** The 2013 to 2016 Long Term FTR Auction cleared 290,700 MW (10.5 percent of demand) of FTR buy bids, compared to 259,885 MW (10.8 percent) in the 2012 to 2015 Long Term FTR Auction. The 2013 to 2016 Long Term FTR Auction also cleared 56,692 MW (26.8 percent) of FTR sell offers, up from 31,288 MW (12.5 percent) in the 2012 to 2015 Long Term FTR Auction.

For the 2012 to 2013 planning period, the Annual FTR Auction cleared 371,295 MW (14.5 percent) of FTR buy bids, compared to 387,743 MW (11.9 percent) for the 2011 to 2012 planning period. The 2012 to 2013 Annual FTR Auction also cleared 35,275 MW (9.9 percent) of FTR sell offers for the 2012 to 2013 planning period, up from 24,960 MW (7.4 percent) for the 2011 to 2012 planning period.

For the first seven months of the 2012 to 2013 planning period, the Monthly Balance of Planning Period FTR Auctions cleared 1,437,437 MW (9.6 percent) of FTR buy bids and 484,697 MW (13.5 percent) of FTR sell offers.

- **Price.** In the 2013 to 2016 Long Term FTR Auction, 95.9 percent of FTRs were purchased for less than \$1 per MW, down from 96.5 percent in the previous Long Term FTR Auction. The weighted-average price for 24-hour buy bids in the Long Term FTR Auction remained constant at \$0.36 per MW. Counter flow buy bid prices were negative, but approximately equal in magnitude, than prevailing flow FTR bid prices.

For the 2012 to 2013 Annual Auction, 90.4 percent of FTRs were purchased for less than \$1 per MW, up from 87.1 percent in the previous Annual FTR Auction. The weighted-average price for 24-hour buy bid obligations in the 2012 to 2013 planning period was \$0.40 per MW, down from \$0.68 in the 2011 to 2012 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 2012 to 2013 planning period was \$0.12, down from \$0.13 per MW in the first seven months of the 2011 to 2012 planning period.

- **Revenue.** The 2013 to 2016 Long Term FTR Auction generated \$28.6 million of net revenue for all FTRs, up from \$20.5 million in the 2012 to 2015 Long Term FTR Auction.

The 2012 to 2013 planning period Annual FTR Auction generated \$602.9 million of net revenue for all FTRs, down from \$1,029.7 million for the 2012 to 2013 planning period.

The Monthly Balance of Planning Period FTR Auctions generated \$17.3 million in net revenue for all FTRs for the first seven months of the 2012 to 2013 planning period, down from \$21.9 million for the same time period in the 2011 to 2012 planning period.

- **Revenue Adequacy.** FTRs were paid at 80.6 percent of the target allocation for the 2011 to 2012 planning period.<sup>7</sup> FTRs were paid at 74.8 percent of the target

<sup>7</sup> Unless specifically noted, payout ratios reported in this section are calculated using PJM's method and are consistent with PJM's reported payout ratios.

allocation level for the first seven months of the 2012 to 2013 planning period. Congestion revenues are allocated to FTR holders based on FTR target allocations. PJM collected \$335.1 million of FTR revenues during the first seven months of the 2012 to 2013 planning period and \$799.4 million during the 2011 to 2012 planning period. For the first seven months of the 2012 to 2013 planning period, the top sink and top source with the highest positive FTR target allocations were Northern Illinois Hub and Quad Cities 1. Similarly, the top sink and top source with the largest negative FTR target allocations were Quad Cities 2 and Eastern Hub.

- **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 -\$7.6 million in profits for physical entities, of which \$151.3 million was from self-scheduled FTRs, and \$78.8 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 12-19, not every FTR was profitable. For example, prevailing flow FTRs purchased by physical entities, but not self-scheduled, were not profitable in 2012. Prevailing flow FTRs, purchased by financial entities, were not profitable in 2012.

## 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 2012 to 2013 planning period were the Pleasant Prairie – Zion Flowgate, approximately 60 miles south of Milwaukee, WI, and the Breed – Wheatland Flowgate, approximately 120 miles west of Indianapolis, IN. 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.** Effective August 1, 2012, PJM is required to offer ARRs to eligible participants when a transmission outage was modeled in the Annual ARR Allocation, but the facility becomes available during the relevant planning year. These ARRs are automatically assigned the month before the effective date and only available on paths prorated in Stage 1 of the Annual ARR Allocation. Residual ARRs are only effective for single, whole months, cannot be self scheduled and their clearing prices are based on monthly FTR auction clearing prices. In the 2012 to 2013 planning period PJM allocated a total of 9,647.6 MW with a total target allocation of \$3,471,223.
- **Demand.** Total requested volume in the annual ARR allocation was 164,770 MW for the 2012 to 2013 planning period with 64,160 MW requested in Stage 1A, 27,325 MW requested in Stage 1B and 57,053 MW requested in Stage 2. This is up from 148,538 MW for the 2011 to 2011 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. 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. Several constraints were over allocated in the 2012 to 2013 Stage 1A ARR Allocation, consistent with the tariff, with a total over allocation of 892 MW.
- **Stage 1A Infeasibility.** In the 2012 to 2013 planning period PJM was required, per the PJM OATT Section 7.4.2 (i) to artificially increase the modeled line ratings of several facilities over their physical capability, to accommodate Stage 1A ARR requests in the ARR Allocation model. The ultimate result of these increased line ratings is an over allocation of ARRs, which contributes to FTR underfunding. PJM was required to increase capability on nine separate facilities for a total of 892 MW.
- **ARR Reassignment for Retail Load Switching.** There were 22,543 MW of ARRs associated with approximately \$226,900 of revenue that were reassigned in the first seven months of the 2012 to 2013 planning period. There were 41,770 MW of ARRs associated with approximately \$758,900 of revenue that were reassigned for the full twelve months of the 2011 to 2012 planning period.

## Market Performance

- Volume.** Of 164,770 MW in ARR requests for the 2012 to 2013 planning period, 97,986 MW (59.5 percent) were allocated. Market participants self scheduled 40,195 MW (45.1 percent) of these allocated ARRs as Annual FTRs. 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.
- Revenue.** There are no ARR revenues. ARRs are allocated to qualifying customers because they pay for the transmission system.
- Revenue Adequacy.** For the first seven months in the 2012 to 2013 planning period, the ARR target allocations were \$565.4 million while PJM collected \$620.2 million from the combined Long Term, Annual and Monthly Balance of Planning Period FTR Auctions through December 31, 2012, making ARRs revenue adequate. For the 2011 to 2012 planning period, the ARR target allocations were \$982.9 million while PJM collected \$1,091.8 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. As a result, several facilities were overallocated for a total of 892 MW. Of the requested ARRs for Stage 1B, 11,581 MW were prorated and of the requested ARRs for Stage 2, 55,201 MW were prorated for the 2012 to 2013 planning period. For the 2011 to 2012 planning period Stage 1A was not prorated nor overallocated. 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.
- 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 2012 to 2013 planning period, the total revenues received by ARR holders, including self-scheduled FTRs, offset 82.1 percent of the congestion costs experienced by these ARR holders in the Day-Ahead Energy Market and the balancing energy market. For the 2011 to

2012 planning period, the total revenues received by the holders of all ARRs and FTRs offset more than 88.8 percent of the total congestion costs within PJM and for the 2010 to 2011 planning period 97.3 percent.

## 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 and FTR holders do not have the right to revenue adequacy.

Revenue adequacy received a lot of attention in the PJM FTR market in 2012. There are several factors that can affect the reported, distribution of and quantity of funding in the FTR market. Revenue adequacy is misunderstood. FTR holders, with the creation of ARRs, do not have the right to financially firm transmission service and FTR holders do not have the right to revenue adequacy. FTR holders appropriately receive revenues based on actual congestion in both day ahead and real time markets. When day ahead congestion differs significantly from real time congestion, as has occurred only recently, this is evidence that there are reporting issues, cross subsidization issues, issues with the level of FTRs sold, and issues with the differences between modeling in the day ahead and real time. Such differences are not an indication that FTR holders are being underallocated total congestion dollars.

The payout ratio reported by PJM is understated. The reported payout ratio does not appropriately consider negative target allocations as a source of revenue to fund FTRs. For 2012 the reported payout ratio is 73.5 percent while the correctly calculated payout ratio is 76.9 percent. The MMU recommends that the calculation of the FTR payout ratio appropriately include negative target allocations as a source of revenue, consistent with actual settlement payout.

FTR target allocations are currently netted within each organization in each hour. This means that within an hour, positive and negative target allocations within an organization's portfolio are offset prior to the application of the payout ratio to the positive target allocation FTRs. The payout ratios are also calculated based on these net FTR positions. The current method requires those participants with fewer negative target allocation FTRs to subsidize those with more negative target allocation FTRs. The current method treats a positive target allocation FTR differently depending on the portfolio of which it is a part. The correct method would treat all FTRs with positive target allocations exactly the same, which would eliminate this form of cross subsidy.

If netting within portfolios were eliminated and the payout ratio were calculated correctly, the payout ratio in 2012 would have been 88.1 percent instead of the reported 73.5 percent. The MMU recommends that netting of positive and negative target allocations within portfolios be eliminated.

The current rules create an asymmetry between the treatment of counter flow and prevailing flow FTRs. Counter flow FTR holders make payments over the planning period, in the form of negative target allocations. These negative target allocations are paid at 100 percent regardless of whether positive target allocation FTRs are paid at less than 100 percent.

There is no reason to treat counter flow FTRs more favorably than prevailing flow FTRs. Counter flow FTRs should also be affected when the payout ratio is less than 100 percent. This would mean that counter flow FTRs would pay back an increased amount that mirrors the decreased payments to prevailing flow FTRs. The adjusted payout ratio would evenly divide the burden of underfunding among counter flow FTR holders and prevailing flow FTR holders by increasing negative counter flow target allocations by the same amount it decreases positive target allocations.

The result of removing portfolio netting and applying a payout ratio to counter flow FTRs would increase the calculated payout ratio in 2012 from the reported 73.5 percent to 91.2 percent. The MMU recommends that counter flow and prevailing flow FTRs should be

treated symmetrically with respect to the application of a payout ratio.

In addition to addressing these issues, the approach to the question of FTR funding should also look at the fundamental reasons that there has been a significant and persistent difference between day ahead and balancing congestion. These reasons include the inadequate transmission outage modeling which ignores all but long term outages known in advance; the different approach to transmission line ratings in the day ahead and real time markets, including reactive interfaces; differences in day ahead and real time modeling including the treatment of loop flows, the treatment of outages, the modeling of PARs and the nodal location of load; the overallocation of ARRs; the appropriateness of seasonal ARR allocations; and the role of up-to congestion transactions. The MMU recommends that these issues be reviewed and modifications implemented where possible. Funding issues that persist as a result of modeling differences should be borne by FTR holders operating in the voluntary FTR market.

## Financial Transmission Rights

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, subject to revenue availability. Effective June 1, 2007, PJM added marginal losses as a component in the calculation of LMP.<sup>8</sup> 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.

<sup>8</sup> 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."

Revenues above that level on individual FTR paths are used to fund FTRs on paths which received less than their target allocations.

FTR funding is not on a path specific basis or on a time specific basis. There are cross subsidies paid to equalize payments across paths and across time periods within a planning period. All paths receive the same proportional level of target revenue. FTR auction revenues and excess revenues are 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 for 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.

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 types of FTR 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.

As one of the measures to address FTR funding, effective August 5, 2011, PJM does not allow 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.

## 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.

## 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.<sup>9</sup> FTRs can also be traded between market participants through bilateral

<sup>9</sup> See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 38.

transactions. ARRs 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.<sup>10</sup> 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 in an annual auction two outages of similar significance and similar duration which do not overlap in time. The choice of which to model may have significant distributional consequences.

### Long Term FTR Auctions

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.<sup>11</sup> 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. FTR products available in the Long Term Auction include 24-hour, on peak and off peak FTR obligations. FTR option products are not available in Long Term FTR Auctions.

<sup>10</sup> See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 54.

<sup>11</sup> 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).

- **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.
- **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.

Table 12-2 and Table 12-3 list the top binding constraints in order of the marginal value of the binding constraint during on peak hours. The marginal value measures the value gained by relieving a constraint by 1 MW and is computed for both peak and off peak hours.<sup>12</sup>

**Table 12-2 Top 10 principal binding transmission constraints limiting the Long Term FTR Auction: Planning periods 2013 to 2016**

Constraint	Type	Control Zone	Severity Ranking by Auction Round		
			1	2	3
Gainesville	Transformer	Dominion	1	1	NA
Monticello - East Winamac	Flowgate	MISO	3	2	1
Oak Grove - Galesburg	Flowgate	MISO	2	NA	NA
Bremo - Kidds Store	Line	Dominion	4	389	NA
Berlin - Silver Lake	Line	AEP	5	NA	NA
Laurel Ave. - Roseland	Line	PSEG	6	9	NA
Cumberland Ave - Bush	Flowgate	MISO	111	4	3
North Seaford - Taylor	Line	DPL	7	158	NA
Middlebourne - Willow	Line	AP	283	5	NA
Gordonsville	Transformer	Dominion	11	NA	4

### Annual FTR Auctions

After the Long Term FTR Auction, residual capability on the PJM transmission system is auctioned in the Annual FTR Auction. Annual FTRs are effective beginning June 1 of the planning period through May 31. Outages expected to last two or more months are included in the determination of the simultaneous feasibility for the Annual FTR Auction. ARR holders who wish to self schedule must inform PJM prior to round one of this auction. Any self scheduled ARR requests clear 25 percent of the requested volume in each round of the Annual FTR Auction as price takers. This auction consists of four rounds 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.

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

FTRs in this auction can be obligations or options for peak, off peak or 24-hour periods. FTRs purchased in one round of the Annual FTR Auction can be sold in later rounds or in the Monthly Balance of Planning Period FTR Auctions.

Figure 12-1 shows the geographic location of the top ten binding constraints from the 2013 to 2016 Long Term FTR Auction, the 2012 to 2013 Annual FTR Auction and the 2012 to 2013 Annual ARR allocation. Many of the top binding constraints are flowgates and the binding constraints are primarily concentrated near the PJM-MISO border.

**Table 12-3 Top 10 principal binding transmission constraints limiting the Annual FTR Auction: Planning period 2012 to 2013**

Constraint	Type	Control Zone	Severity Ranking by Auction Round			
			1	2	3	4
Cumberland Ave - Bush	Flowgate	MISO	1	1	1	1
Stephenson - Stonewall	Line	AP	2	2	2	2
Monticello - East Winamac	Flowgate	MISO	6	3	3	3
Graceton - Raphael Road	Line	BGE	9	5	4	4
Belmont	Transformer	AP	3	4	5	8
Michigan City - Laporte	Line	AEP	4	8	8	12
Doubs	Transformer	AP	5	7	7	7
Stillwell	Flowgate	MISO	NA	159	NA	6
Lanesville	Flowgate	MISO	7	9	10	9
Zion	Transformer	ComEd	8	6	6	NA

**Figure 12-1 Geographic location of top ten binding constraints for the 2013 to 2016 Long Term and 2012 to 2013 Annual FTR Auctions and 2012 to 2013 Annual ARR allocation**

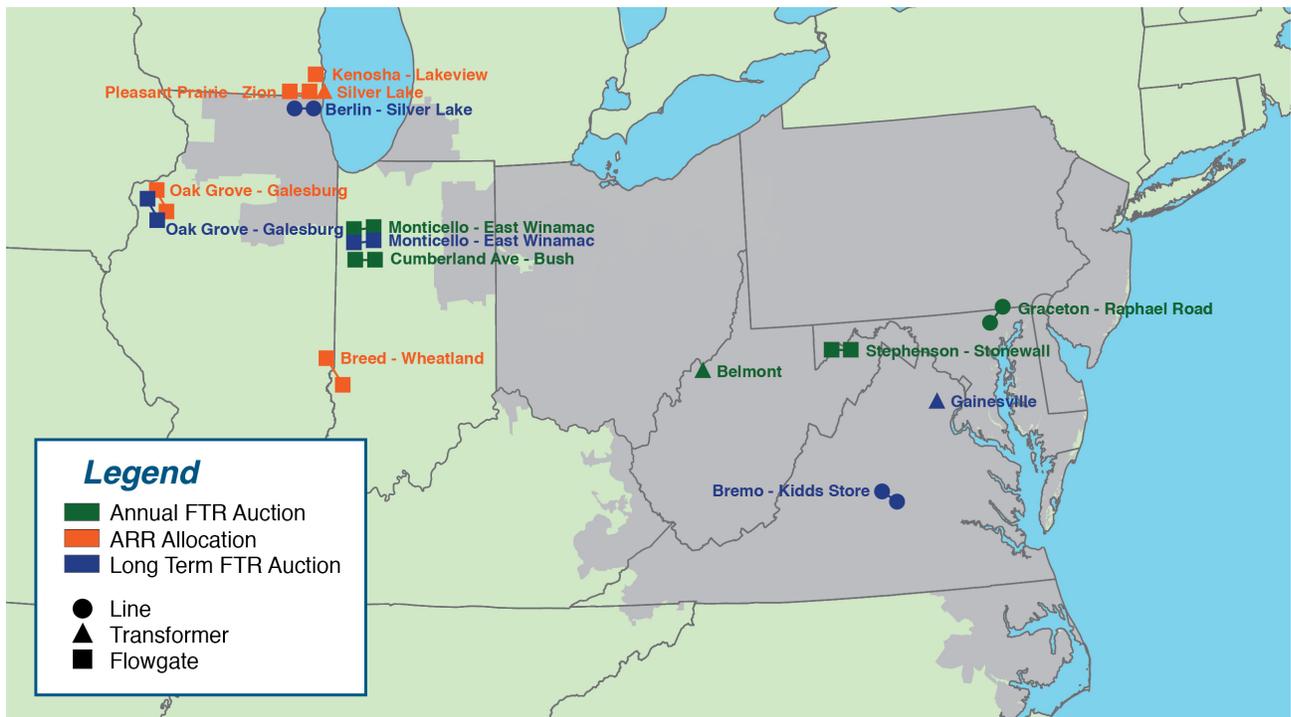


Table 12-3 shows the top 10 binding constraints for the 2012 to 2013 Annual FTR Auction based on the marginal value of on peak hours.

## 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. Existing FTRs are modeled as fixed injections and withdraws. Outages expected to last five or more days are included in the determination of the simultaneous feasibility test for the Monthly Balance of Planning Period FTR Auction. 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.<sup>13</sup>

## 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 2013 to 2016 Long Term FTR Auction, total FTR cleared buy bids increased 11.9 percent to 290,700 MW. In the Annual FTR Auction, total cleared FTR buy bids and self-scheduled bids decreased 4.2 percent to 371,295 MW. The total FTR buy bids from the Monthly Balance

of Planning Period FTR Auctions for the first seven months of the 2012 to 2013 planning period decreased 9.6 percent to 1,437,438 MW.

## 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 the secondary bilateral market.

The ownership concentration of cleared FTR buy bids resulting from the 2012 to 2013 Annual FTR Auction was low for peak and off peak FTR obligations and moderately concentrated for 24-hour FTR obligations. The ownership concentration was highly concentrated for 24-hour buy bid options, but only moderately concentrated for peak and off peak FTR buy bid options for the same time period.

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 2013 to 2016 Long Term FTR Auction market cleared FTRs by trade type, organization type and FTR direction. The results show that financial entities purchased 80.4 percent of prevailing flow buy bid FTRs and 91.9 percent of counter flow buy bid FTRs with the result that financial entities purchased 85.5 percent of all Long Term FTR Auction cleared buy bids for the 2013 to 2016 Long Term FTR Auction.

<sup>13</sup> See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 39.

**Table 12-4 Long Term FTR Auction patterns of ownership by FTR direction: Planning periods 2013 to 2016**

Trade Type	Organization Type	FTR Direction		All
		Prevailing Flow	Counter Flow	
Buy Bids	Physical	19.6%	8.1%	14.5%
	Financial	80.4%	91.9%	85.5%
	Total	100.0%	100.0%	100.0%
Sell Offers	Physical	3.3%	1.7%	2.7%
	Financial	96.7%	98.3%	97.3%
	Total	100.0%	100.0%	100.0%

Table 12-5 presents the Annual FTR Auction cleared FTRs for the 2012 to 2013 planning period by trade type, organization type and FTR direction. In the Annual FTR Auction for the 2012 to 2013 planning period, financial entities purchased 55.8 percent of prevailing flow FTRs and 77.8 percent of counter flow FTRs with the result that financial entities purchased 61.8 percent of all Annual FTR Auction cleared buy bids for the 2012 to 2013 planning period.

**Table 12-5 Annual FTR Auction patterns of ownership by FTR direction: Planning period 2012 to 2013**

Trade Type	Organization Type	Self-Scheduled FTRs	FTR Direction		All
			Prevailing Flow	Counter Flow	
Buy Bids	Physical	Yes	14.9%	1.5%	11.2%
		No	29.3%	20.7%	26.9%
		Total	44.2%	22.2%	38.2%
	Financial	No	55.8%	77.8%	61.8%
	Total		100.0%	100.0%	100.0%
Sell Offers	Physical		12.5%	4.8%	9.5%
	Financial		87.5%	95.2%	90.5%
	Total		100.0%	100.0%	100.0%

Table 12-6 presents the Monthly Balance of Planning Period FTR Auction cleared FTRs for January through June 2012 by trade type, organization type and FTR direction. Financial entities purchased 81.1 percent of prevailing flow and 84.6 percent of counter flow FTRs for 2012 with the result that financial entities purchased 60.5 percent of all prevailing and counter flow FTR buy bids in the Monthly Balance of Planning Period FTR Auction cleared FTRs for January through December 2012.

**Table 12-6 Monthly Balance of Planning Period FTR Auction patterns of ownership by FTR direction: January through December 2012**

Trade Type	Organization Type	FTR Direction		All
		Prevailing Flow	Counter Flow	
Buy Bids	Physical	18.9%	15.4%	17.5%
	Financial	81.1%	84.6%	82.5%
	Total	100.0%	100.0%	100.0%
Sell Offers	Physical	22.4%	8.0%	18.4%
	Financial	77.6%	92.0%	81.6%
	Total	100.0%	100.0%	100.0%

Table 12-7 presents the daily FTR net position ownership for January through December 2012 by FTR direction.

**Table 12-7 Daily FTR net position ownership by FTR direction: January through December 2012**

Organization Type	FTR Direction		All
	Prevailing Flow	Counter Flow	
Physical	45.6%	19.9%	37.2%
Financial	54.4%	80.1%	62.8%
Total	100.0%	100.0%	100.0%

## Integration of DEOK

On January 1, 2012, the Duke Energy Ohio and Kentucky (DEOK) zone was integrated into PJM. DEOK zonal customers were eligible to participate in a direct allocation of FTRs effective from January 1, 2012 through May 31, 2012. In addition, on June 1, 2011 the American Transmission Systems, Inc. (ATSI) zone was integrated into PJM. Eligible customers in this zone participated in the 2011 to 2012 Annual ARR Allocation or elected to receive a direct allocation of FTRs instead of ARRs. For both the ATSI and DEOK zones a transitional period of two planning periods was established during which participants with firm transmission service that sources or sinks in these zones may elect to receive directly allocated FTRs instead of ARRs. Table 12-8 shows the direct allocation of FTRs in the DEOK zone for the 2011 to 2012 planning period. This FTR volume is not included in the monthly auction data. In the DEOK zone, 5,396 MW of FTRs were requested with 4,616 MW (86 percent) cleared. These FTRs were effective only from the date of integration to the end of the planning period, January 1, 2012 through May 31, 2012.

**Table 12-8 Directly allocated FTR volume for DEOK Control Zone: January 1, 2012 through May 31, 2012<sup>14</sup>**

Planning Period*	Bid and Requested		Cleared		Uncleared	
	Count	Volume (MW)	Volume (MW)	Volume	Volume (MW)	Volume
2011/2012	519	5,396	4,616	86%	781	14%

\*Effective January 1, 2012 through May 31, 2012

Table 12-9 shows the FTRs directly allocated to participants in the ATSI and DEOK Control Zones for the 2012 to 2013 planning period. Participants requested 9,902.7 MW and 2,257.7 MW of FTRs in the ATSI and DEOK zones with 4,874.8 MW (49.2 percent) and 545.5 MW (24.2 percent) clearing.

**Table 12-9 Directly allocated FTR volume for ATSI and DEOK Control Zones: Planning period 2012 to 2013**

Zone	Bid and Requested		Cleared		Uncleared	
	Count	Volume (MW)	Volume (MW)	Volume	Volume (MW)	Volume
ATSI	324	9,902.7	4,874.8	49.2%	5,027.9	50.8%
DEOK	78	2,257.7	545.5	24.2%	1,712.2	75.8%

## Market Behavior

### FTR Forfeitures

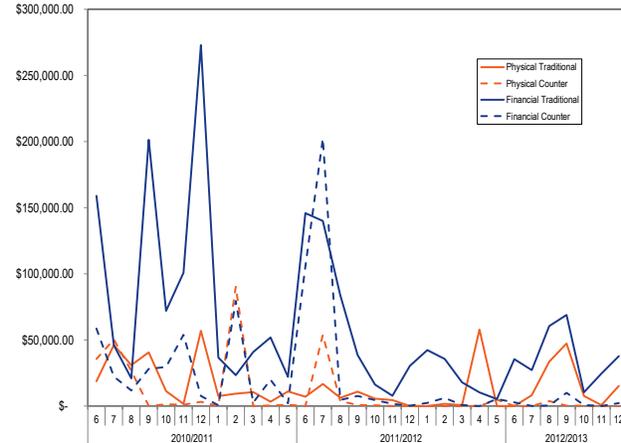
An FTR holder may be subject to forfeiture of any profits from an FTR if it meets the criteria defined in Section 5.2.1 (b) of Schedule 1 of the PJM Operating Agreement. If a participant has a cleared increment offer or decrement bid for an applicable hour at or near the source or sink of any FTR they own and the day-ahead congestion LMP difference is greater than the real time congestion LMP difference the profits from that FTR may be subject to forfeiture for that hour. An increment offer or decrement bid is considered near the source or sink point if 75 percent or more of the energy injected or withdrawn, and which is withdrawn or injected at any other bus, is reflected on the constrained path between the FTR source or sink. This rule only applies to increment offers and decrement bids that would increase the price separation between the FTR source and sink points.

Figure 12-2 shows the FTR forfeitures values for both counter flow and prevailing flow FTRs for each month of June 2010 through December 2012 by company type.

<sup>14</sup> The volume data presented in Table 12-8 are not included in the monthly FTR ownership, volume or revenue data.

Total forfeitures for the first seven months of the 2012 to 2013 planning period were \$398,630.

**Figure 12-2 Monthly FTR Forfeitures for physical and financial participants: June 2010 through December 2012**



### Credit Issues

The credit issues reported here were not necessarily related to FTR positions.

In June 2012, PJM processed \$38 million of billing adjustments associated with marginal loss surplus allocations. These billing adjustments required participants to repay refunds which had been previously ordered by FERC and subsequently reversed by FERC. Five of the companies required to repay the allocation defaulted based on inadequate collateral and fifteen defaulted on payment of their billing adjustments, totaling \$28.3 million in defaults. One company cured its payment default. Default Allocation Assessments were included in the next monthly bill for non-defaulted members to cover the unpaid billing adjustments. Twenty five additional members defaulted on \$96,000 of their payment obligations resulting from these billed Default Allocation Assessments.

In addition, unrelated to the marginal loss surplus billing adjustments, twenty participants defaulted during 2012 from twenty one default events. The average of these defaults was \$381,772, with nine based on inadequate collateral and eleven based on nonpayment. The average collateral default was \$790,300 and the average nonpayment default was \$47,522. The majority of these defaults were promptly cured.

As reported in a filing to FERC on April 23, 2012, PJM terminated RTP Controls, Inc's membership due to a credit default effective March 9, 2012.<sup>15</sup> RTP Controls was declared in default three times within a twelve month period, and in accordance with sections 15.1.6(c) and 4.1(c) of the Operating Agreement its membership was terminated and its forward market positions liquidated.

## Market Performance

### Volume

Table 12-10 shows the 2013 to 2016 Long Term FTR Auction volume by trade type, FTR direction and period type.<sup>16</sup> The total volume was 2,481,922 MW for FTR buy bids and 154,624 MW for FTR sell offers in the 2013 to 2016 Long Term FTR Auction. This represents a 3.4 percent increase in buy bids and a 31.6 percent increase in FTR sell offers over the 2012 to 2015 Long Term FTR Auction.

**Table 12-10 Long Term FTR Auction market volume: Planning periods 2013 to 2016**

Trade Type	FTR Direction	Period Type	Bid and Requested		Cleared Volume (MW)	Uncleared		
			Requested Count	Volume (MW)		Cleared Volume	Volume (MW)	Uncleared Volume
Buy bids	Counter Flow	Year 1	52,950	207,509	52,684	25.4%	154,825	74.6%
		Year 2	40,530	162,112	36,608	22.6%	125,504	77.4%
		Year 3	37,900	155,688	38,375	24.6%	117,312	75.4%
		Year All	428	2,914	1,800	61.8%	1,114	38.2%
		Total	131,808	528,223	129,467	24.5%	398,756	75.5%
	Prevailing Flow	Year 1	147,937	855,264	64,251	7.5%	791,012	92.5%
		Year 2	120,754	681,666	47,737	7.0%	633,929	93.0%
		Year 3	117,194	662,370	48,634	7.3%	613,735	92.7%
		Year All	7,369	45,099	610	1.4%	44,489	98.6%
		Total	393,254	2,244,398	161,232	7.2%	2,083,166	92.8%
<b>Total</b>		525,062	2,772,621	290,700	10.5%	2,481,922	89.5%	
Sell offers	Counter Flow	Year 1	14,863	47,888	11,436	23.9%	36,452	76.1%
		Year 2	8,849	32,052	9,174	28.6%	22,878	71.4%
		Year 3	4,259	10,657	691	6.5%	9,967	93.5%
		Year All	NA	NA	NA	NA	NA	NA
		Total	27,971	90,597	21,300	23.5%	69,296	76.5%
	Prevailing Flow	Year 1	18,949	69,609	20,390	29.3%	49,219	70.7%
		Year 2	10,849	41,737	13,619	32.6%	28,118	67.4%
		Year 3	3,822	9,373	1,382	14.7%	7,991	85.3%
		Year All	NA	NA	NA	NA	NA	NA
		Total	33,620	120,719	35,391	29.3%	85,327	70.7%
<b>Total</b>		61,591	211,315	56,692	26.8%	154,624	73.2%	

The 2013 to 2016 Long Term FTR Auction cleared 290,700 MW (10.5 percent) of FTR buy bids, compared to 259,885 MW (10.8 percent) in the previous Long Term

FTR Auction. The 2012 to 2015 Long Term FTR Auction also cleared 56,692 MW (26.8 percent) of FTR sell offers, compared to 31,288 MW (12.5 percent) in the previous Long Term FTR Auction.

The volume of buy bids for the period covering all three years of the Long Term FTR Auction was 49,013 MW for both prevailing and counter flow FTRs, with a total of 2,400 MW clearing (4.9 percent). In the previous Long Term FTR Auction the buy bids for the three year FTR were 830 MW with none clearing, representing a 580.5 percent increase in buy bids for the 2013 to 2016 planning periods.

In the 2013 to 2016 Long Term FTR Auction 129,467 MW (24.5 percent of demand; 44.5 percent of total FTR volume) of counter flow FTR buy bids and 161,232 MW (10.5 percent of demand; 55.5 percent of total FTR volume) of prevailing flow FTR buy bids cleared. In the 2013 to 2016 Long Term FTR Auction, there were 90,597 MW (23.5 percent) of counter flow sell offers and 35,391 MW (29.3 percent) of prevailing flow sell offers cleared.

In the Annual FTR Auction for the 2012 to 2013 planning period, total participant FTR sell offers were 356,299 MW, up 5.6 percent from the 2011 to 2012 planning period, and total FTR buy bids were 2,561,835 MW, down 21.4 percent from the 2011 to 2012 planning period. For the 2012 to 2013 planning period 371,295 MW (14.5 percent) of buy bids cleared, down 4.2 percent from the previous planning period, and 35,275 MW (9.9 percent) of sell offers cleared, up 41.3 percent from the previous planning period.

Table 12-11 provides the Annual FTR Auction market volume for the 2012 to 2013 planning period.

<sup>15</sup> Burlew, James. Letter to Honorable Kimberly D. Bose. April 23, 2012.

<sup>16</sup> 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 12-11 Annual FTR Auction market volume:  
Planning period 2012 to 2013**

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	74,408	357,104	100,369	28.1%	256,735	71.9%	
		Prevailing Flow	185,534	1,271,013	186,286	14.7%	1,084,727	85.3%	
		Total	259,942	1,628,116	286,655	17.6%	1,341,462	82.4%	
	Options	Counter Flow	172	13,006	0	0.0%	13,006	100.0%	
		Prevailing Flow	28,074	878,996	42,924	4.9%	836,073	95.1%	
		Total	28,246	892,002	42,924	4.8%	849,079	95.2%	
	Total	Counter Flow	74,580	370,110	100,369	27.1%	269,741	72.9%	
		Prevailing Flow	213,608	2,150,009	229,209	10.7%	1,920,800	89.3%	
		Total	288,188	2,520,119	329,578	13.1%	2,190,541	86.9%	
	Self-scheduled bids	Obligations	Counter Flow	259	1,522	1,522	100.0%	0	0.0%
			Prevailing Flow	6,257	40,195	40,195	100.0%	0	0.0%
			Total	6,516	41,716	41,716	100.0%	0	0.0%
Buy and self-scheduled bids	Obligations	Counter Flow	74,667	358,626	101,891	28.4%	256,735	71.6%	
		Prevailing Flow	191,791	1,311,207	226,480	17.3%	1,084,727	82.7%	
		Total	266,458	1,669,833	328,371	19.7%	1,341,462	80.3%	
	Options	Counter Flow	172	13,006	0	0.0%	13,006	100.0%	
		Prevailing Flow	28,074	878,996	42,924	4.9%	836,073	95.1%	
		Total	28,246	892,002	42,924	4.8%	849,079	95.2%	
	Total	Counter Flow	74,839	371,632	101,891	27.4%	269,741	72.6%	
		Prevailing Flow	219,865	2,190,204	269,404	12.3%	1,920,800	87.7%	
		Total	294,704	2,561,835	371,295	14.5%	2,190,541	85.5%	
	Sell offers	Obligations	Counter Flow	34,568	128,409	13,805	10.8%	114,604	89.2%
			Prevailing Flow	55,318	207,839	21,241	10.2%	186,598	89.8%
			Total	89,886	336,247	35,046	10.4%	301,202	89.6%
Options		Counter Flow	5	100	0	0.0%	100	100.0%	
		Prevailing Flow	2,090	19,951	229	1.1%	19,722	98.9%	
		Total	2,095	20,051	229	1.1%	19,822	98.9%	
Total		Counter Flow	34,573	128,509	13,805	10.7%	114,704	89.3%	
		Prevailing Flow	57,408	227,790	21,470	9.4%	206,320	90.6%	
		Total	91,981	356,299	35,275	9.9%	321,024	90.1%	

Table 12-12 shows the proportion of ARRs self scheduled as FTRs for the last four planning periods. The maximum possible level of self-scheduled FTRs includes all ARRs, including RTEP ARRs. Eligible participants self scheduled 41,716 MW (42.1 percent) of ARRs into FTRs for the 2012 to 2013 planning period, down from 46,017 MW (44.4 percent) in the previous planning period.

Table 12-12 Comparison of self-scheduled FTRs: Planning periods from 2008 to 2009 through 2012 to 2013

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%
2012/2013	41,716	99,115	42.1%

Table 12-13 Monthly Balance of Planning Period FTR Auction market volume: January through December 2012

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-12	Obligations	Buy bids	185,712	1,024,729	146,344	14.3%	878,385	85.7%
		Sell offers	75,415	421,756	48,770	11.6%	372,986	88.4%
	Options	Buy bids	2,721	215,626	1,680	0.8%	213,946	99.2%
		Sell offers	5,615	45,756	10,572	23.1%	35,184	76.9%
Feb-12	Obligations	Buy bids	207,775	1,039,918	147,207	14.2%	892,711	85.8%
		Sell offers	80,631	375,855	47,609	12.7%	328,246	87.3%
	Options	Buy bids	2,247	194,423	2,620	1.3%	191,804	98.7%
		Sell offers	5,299	42,130	8,241	19.6%	33,889	80.4%
Mar-12	Obligations	Buy bids	197,115	893,900	156,694	17.5%	737,206	82.5%
		Sell offers	77,440	400,030	50,162	12.5%	349,868	87.5%
	Options	Buy bids	3,463	232,307	5,079	2.2%	227,228	97.8%
		Sell offers	5,869	60,228	11,952	19.8%	48,276	80.2%
Apr-12	Obligations	Buy bids	142,073	662,487	128,791	19.4%	533,695	80.6%
		Sell offers	55,915	306,492	49,050	16.0%	257,442	84.0%
	Options	Buy bids	4,259	133,298	2,427	1.8%	130,871	98.2%
		Sell offers	3,767	40,214	9,597	23.9%	30,617	76.1%
May-12	Obligations	Buy bids	89,626	464,275	93,721	20.2%	370,554	79.8%
		Sell offers	27,827	156,483	42,051	26.9%	114,432	73.1%
	Options	Buy bids	539	6,220	921	14.8%	5,299	85.2%
		Sell offers	2,017	18,909	10,402	55.0%	8,507	45.0%
Jun-12	Obligations	Buy bids	231,094	1,308,800	200,836	15.3%	1,107,963	84.7%
		Sell offers	88,406	418,825	33,562	8.0%	385,262	92.0%
	Options	Buy bids	20,190	1,314,332	8,527	0.6%	1,305,806	99.4%
		Sell offers	19,390	163,948	35,669	21.8%	128,279	78.2%
Jul-12	Obligations	Buy bids	268,379	1,355,612	244,325	18.0%	1,111,287	82.0%
		Sell offers	103,032	444,140	43,815	9.9%	400,325	90.1%
	Options	Buy bids	20,083	1,379,657	7,624	0.6%	1,372,033	99.4%
		Sell offers	15,896	113,139	25,438	22.5%	87,701	77.5%
Aug-12	Obligations	Buy bids	240,490	1,320,134	219,428	16.6%	1,100,706	83.4%
		Sell offers	108,381	395,062	49,382	12.5%	345,680	87.5%
	Options	Buy bids	4,582	98,115	7,004	7.1%	91,112	92.9%
		Sell offers	17,553	114,076	25,357	22.2%	88,719	77.8%
Sep-12	Obligations	Buy bids	232,215	1,308,752	206,467	15.8%	1,102,286	84.2%
		Sell offers	127,461	456,861	43,445	9.5%	413,416	90.5%
	Options	Buy bids	14,767	1,137,801	10,587	0.9%	1,127,214	99.1%
		Sell offers	17,728	111,945	27,256	24.3%	84,688	75.7%
Oct-12	Obligations	Buy bids	212,873	1,189,069	183,994	15.5%	1,005,075	84.5%
		Sell offers	131,361	431,358	47,798	11.1%	383,560	88.9%
	Options	Buy bids	5,672	121,791	5,639	4.6%	116,151	95.4%
		Sell offers	13,851	91,016	23,783	26.1%	67,233	73.9%
Nov-12	Obligations	Buy bids	184,712	984,123	147,854	15.0%	836,269	85.0%
		Sell offers	97,610	284,595	36,608	12.9%	247,987	87.1%
	Options	Buy bids	14,263	1,158,108	6,272	0.5%	1,151,836	99.5%
		Sell offers	12,791	91,762	19,025	20.7%	72,737	79.3%
Dec-12	Obligations	Buy bids	170,972	1,093,875	183,722	16.8%	910,153	83.2%
		Sell offers	105,736	374,995	49,505	13.2%	325,490	86.8%
	Options	Buy bids	13,703	1,136,516	5,159	0.5%	1,131,356	99.5%
		Sell offers	14,103	98,103	24,054	24.5%	74,050	75.5%
2011/2012*	Obligations	Buy bids	2,787,546	15,084,909	2,216,646	14.7%	12,868,263	85.3%
		Sell offers	1,078,612	5,164,979	551,669	10.7%	4,613,310	89.3%
	Options	Buy bids	40,237	2,549,347	58,829	2.3%	2,490,519	97.7%
		Sell offers	99,695	687,656	164,180	23.9%	523,476	76.1%
2012/2013**	Obligations	Buy bids	1,540,735	8,560,365	1,386,626	16.2%	7,173,739	83.8%
		Sell offers	761,987	2,805,836	304,115	10.8%	2,501,721	89.2%
	Options	Buy bids	93,260	6,346,319	50,812	0.8%	6,295,508	99.2%
		Sell offers	111,312	783,988	180,581	23.0%	603,407	77.0%

\* Shows Twelve Months for 2011/2012; \*\* Shows seven months ended 31-Dec-12 for 2012/2013

Table 12-13 provides the Monthly Balance of Planning Period FTR Auction market volume for 2012, the entire 2011 to 2012 planning period and the first seven months of the 2012 to 2013 planning period. There were 8,560,365 MW of FTR buy bid obligations and 2,805,836 MW of FTR sell offer obligations for all bidding periods in the 2012 to 2013 planning period through December 31, 2012. The monthly balance of planning period auctions cleared 1,386,626 MW (16.2 percent) of FTR buy bid obligations and 304,115 MW (10.8 percent) of FTR sell off obligations.

**Table 12-14 Monthly Balance of Planning Period FTR Auction buy-bid, bid and cleared volume (MW per period): January through June 2012**

Monthly Auction	MW Type	Prompt Month	Second Month	Third Month	Q1	Q2	Q3	Q4	Total
Jan-12	Bid	649,775	210,717	168,284				211,578	1,240,355
	Cleared	110,546	15,316	8,624				13,537	148,024
Feb-12	Bid	651,268	240,292	189,159				153,622	1,234,341
	Cleared	103,278	20,608	15,634				10,307	149,827
Mar-12	Bid	570,266	266,873	208,586				80,482	1,126,207
	Cleared	117,447	22,710	16,217				5,400	161,773
Apr-12	Bid	579,513	216,271						795,784
	Cleared	115,408	15,810						131,218
May-12	Bid	470,495							470,495
	Cleared	94,642							94,642
Jun-12	Bid	708,790	372,480	348,955	92,103	365,680	369,416	365,707	2,623,132
	Cleared	104,967	20,127	16,731	9,850	22,471	17,552	17,664	209,363
Jul-12	Bid	810,399	393,948	356,419		397,111	396,290	381,102	2,735,269
	Cleared	130,965	26,218	17,256		25,812	27,939	23,759	251,949
Aug-12	Bid	650,279	166,379	162,525		121,561	163,558	153,946	1,418,249
	Cleared	130,706	20,892	20,608		11,719	22,169	20,337	226,432
Sep-12	Bid	794,152	384,866	356,543		120,840	400,055	390,097	2,446,553
	Cleared	120,426	26,470	19,959		8,747	21,376	20,076	217,053
Oct-12	Bid	603,893	208,370	131,916			187,027	179,654	1,310,859
	Cleared	121,842	23,661	9,175			17,652	17,304	189,633
Nov-12	Bid	716,796	346,772	339,248			362,368	377,047	2,142,231
	Cleared	96,262	12,862	9,548			14,916	20,539	154,126
Dec-12	Bid	792,466	360,631	357,417			336,770	383,106	2,230,391
	Cleared	127,590	16,119	15,003			10,255	19,913	188,881

There were 6,346,319 MW of FTR buy bid options and 783,988 MW of FTR sell offer options for all bidding periods in the Monthly Balance of Planning Period FTR Auctions for the 2012 to 2013 planning period through December 31, 2012. The monthly auctions cleared 50,812 MW (0.8 percent) of FTR buy bid options, an increase of 10.2 percent over the previous planning period, and 180,581 MW (23.0 percent) of FTR sell offers, an increase of 59.2 percent.

The Monthly Balance of Planning Period FTR Auctions for the full 12-months of the 2011 to 2012 planning period had a total demand of 17,646,257 MW for FTR buy bids, an increase of 23.4 percent over the previous

planning period, and 5,852,635 MW of FTR sell offers, an increase of 45.7 percent over the previous planning period. The total cleared FTR volume for the 2011 to 2012 planning period was 2,275,474 MW (12.9 percent) for FTR buy bids and 715,849 MW (12.2 percent) for FTR sell offers. Of the cleared volume 2,216,646 MW (97.4 percent) were buy bid obligations and 551,669 MW (77.1 percent) were sell offer obligations.

In the Monthly Balance of Planning Period FTR Auctions for the 2011 to 2012 planning period, total participant FTR sell offers were 5,852,635 MW, up from 4,017,266 MW for the same period during the 2010 to 2011 planning period. The total FTR buy bids from the Monthly Balance

of Planning Period FTR Auctions for the 2011 to 2012 planning period increased 23.4 percent from 14,291,535 MW, during the same time period of the prior planning period, to 17,634,256 MW. For the 2011 to 2012 planning period, FTR auctions cleared 2,275,475 MW (12.9 percent) of FTR buy bids and 715,849 MW (12.2 percent) of sell offers.

Table 12-14 presents the buy-bid, bid and cleared volume of the Monthly Balance of Planning Period FTR Auction, and the effective periods for the volume.

Figure 12-3 shows cleared auction volumes as a percent of the total FTR cleared volume by calendar months for June 2004 through December 2012, by type of auction. FTR volumes are included in the calendar month they are effective, with Long Term and Annual FTR auction volume spread equally to each month in the relevant planning period. This figure shows the share of FTRs purchased in each auction type by month. Over the course of the planning period an increasing number of Monthly Balance of Planning Period FTRs are purchased, making them a greater portion of active FTRs. When the Annual FTR Auction occurs, FTRs purchased in any previous Monthly Balance of Planning Period Auction, other than the current June auction, are no longer in effect, so there is a reduction in their share of total FTRs with an accompanying rise in the share of Annual FTRs.

**Figure 12-3 Cleared auction volume (MW) as a percent of total FTR cleared volume by calendar month: June 2004 through December 2012<sup>17</sup>**

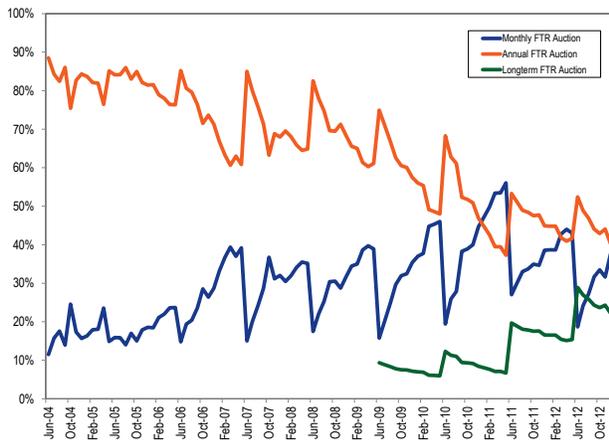


Table 12-15 provides the secondary bilateral FTR market volume for the entire 2011 to 2012 planning period and the four months of the 2012 to 2013 planning period.

<sup>17</sup> Figure 12-3 does not include volume from FTRs directly allocated to either DEOK or ATSI zones as part of their integration for the 2011 to 2012 or 2012 to 2013 planning periods.

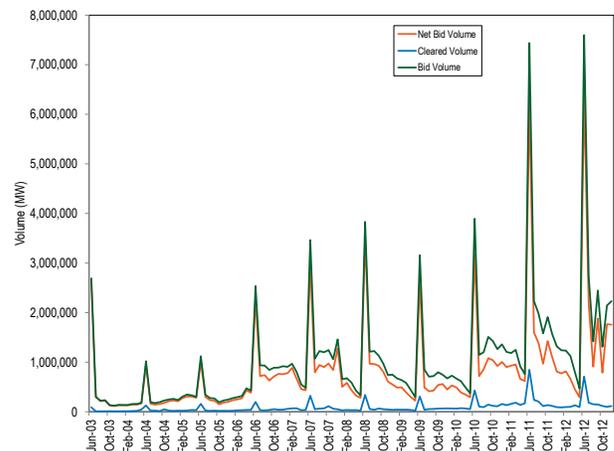
**Table 12-15 Secondary bilateral FTR market volume: Planning periods 2011 to 2012 and 2012 to 2013<sup>18</sup>**

Planning Period	Hedge Type	Class Type	Volume (MW)
2011/2012	Obligation	24-Hour	239
		On Peak	11,925
		Off Peak	4,268
	Total	16,431	
	Option	24-Hour	0
		On Peak	8,965
		Off Peak	6,330
		Total	15,296
2012/2013*	Obligation	24-Hour	90
		On Peak	48
		Off Peak	0
		Total	137
	Option	24-Hour	0
		On Peak	0
		Off Peak	0
		Total	0

\* Shows seven months ended 31-Dec-2012

Figure 12-4 shows the FTR bid, cleared and net bid volume from June 2003 through December 2012 for Long Term, Annual and Monthly Balance of Planning Period Auctions. Cleared volume is the volume of FTR buy and sell offers that were accepted. The net bid volume includes the total buy, sell and self-scheduled offers, counting sell offers as a negative volume. The bid volume is the total of all bid and self-scheduled offers, excluding sell offers. Bid volumes and net bid volumes have increased since 2003. Cleared volume was relatively steady until 2010, with an increase in 2011 followed by a slight decrease in 2012. The demand for FTRs has increased while availability of FTRs generally did not increase until 2011.

**Figure 12-4 Long Term, Annual and Monthly FTR Auction bid and cleared volume: June 2003 through December 2012**



<sup>18</sup> The 2012 to 2013 planning period covers bilateral FTRs that are effective for any time between June 1, 2012 through December 31, 2012, which originally had been purchased in a Long Term FTR Auction, Annual FTR Auction or Monthly Balance of Planning Period FTR Auction.

## Price

Table 12-16 shows the cleared, weighted-average prices by trade type, FTR direction, period type and class type for the 2013 to 2016 Long Term FTR Auction. Only FTR obligation products are available in the Long Term FTR Auctions. In this auction, weighted-average buy bid FTR prices were \$0.05 per MW, the same as the 2012 to 2015 Long Term FTR Auction prices, while weighted-average sell offer FTR prices were \$0.14 per MW, down \$0.10 per MW from the previous Long Term FTR Auction.

**Table 12-16 Long Term FTR Auction weighted-average cleared prices (Dollars per MW): Planning periods 2013 to 2016**

			Class Type				
Trade Type	FTR Direction	Period Type	24-Hour	On Peak	Off Peak	All	
Buy bids	Counter Flow	Year 1	(\$0.76)	(\$0.36)	(\$0.22)	(\$0.30)	
		Year 2	(\$0.74)	(\$0.32)	(\$0.20)	(\$0.26)	
		Year 3	(\$0.86)	(\$0.25)	(\$0.15)	(\$0.21)	
		Year All	NA	(\$0.05)	(\$0.03)	(\$0.04)	
		Total	(\$0.78)	(\$0.31)	(\$0.19)	(\$0.25)	
Prevailing Flow	Year 1	\$1.56	\$0.39	\$0.26	\$0.36		
	Year 2	\$1.06	\$0.32	\$0.21	\$0.28		
	Year 3	\$1.14	\$0.27	\$0.16	\$0.23		
	Year All	NA	\$0.12	\$0.13	\$0.13		
	Total	\$1.32	\$0.33	\$0.21	\$0.29		
Total			\$0.36	\$0.06	\$0.02	\$0.05	
	Sell offers	Counter Flow	Year 1	(\$0.76)	(\$0.17)	(\$0.08)	(\$0.13)
			Year 2	NA	(\$0.11)	(\$0.04)	(\$0.06)
			Year 3	NA	(\$0.25)	(\$0.16)	(\$0.20)
			Year All	NA	NA	NA	NA
Total			(\$0.76)	(\$0.15)	(\$0.07)	(\$0.10)	
Prevailing Flow	Year 1	\$0.72	\$0.42	\$0.22	\$0.33		
	Year 2	\$0.86	\$0.29	\$0.14	\$0.22		
	Year 3	NA	\$0.32	\$0.19	\$0.27		
	Year All	NA	NA	NA	NA		
	Total	\$0.78	\$0.37	\$0.19	\$0.28		
Total			(\$0.17)	\$0.22	\$0.07	\$0.14	

Figure 12-5 shows the cleared buy bid price frequency for the 2013 to 2016 Long Term FTR Auction and that 95.9 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 2013 to 2016 Long Term FTR Auction fall into the \$0 to \$2 range.

**Figure 12-5 Long Term FTR Auction clearing price per MW frequency: Planning periods 2013 to 2016**

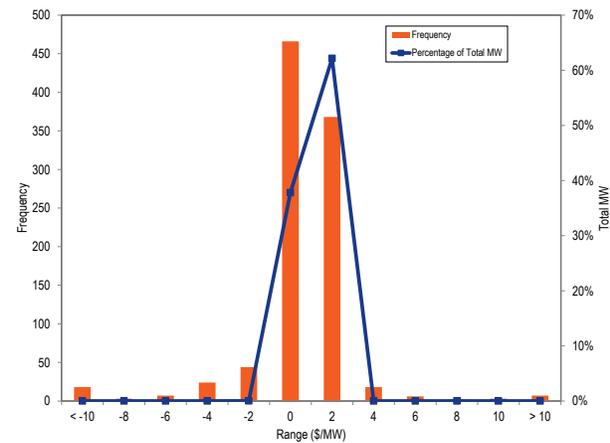


Table 12-17 shows the weighted-average cleared buy-bid prices by trade type, hedge type, FTR direction and class type for the Annual FTR Auction for the 2012 to 2013 planning period. For the 2012 to 2013 planning period the weighted-average buy bid FTR price was \$0.23 per MW, up from \$0.16 per MW in the 2011 to 2012 planning period. Buy bid obligation prices were \$0.26 per MW, a \$0.15 per MW decrease, and buy bid option prices were \$0.23 per MW, a \$0.07 per MW increase over the previous planning period. Weighted-average buy bid FTR obligation prices for counter flow FTRs were -\$0.29 per MW, a \$0.18 per MW increase over the previous planning period.

Self-scheduled FTRs are price takers and do not enter a bid price into the Annual FTR Auction. The prices reported here reflect the prices set in the auction on the FTR paths that were self-scheduled. On average in the 2012 to 2013 Annual FTR Auction, self-scheduled FTRs, priced at \$0.65 per MW, were priced \$0.39 per MW higher than buy bid obligation FTRs, but a \$0.51 per MW decrease over the 2011 to 2012 planning period. Self-scheduled counter flows FTRs were priced only \$0.01 per MW lower than buy bid obligation counter flow FTRs and self-scheduled prevailing flow FTRs were priced \$0.14 per MW higher than buy bid obligations. In the 2011 to 2012 planning period, these differences were \$0.36 per MW and \$0.41 per MW.

**Table 12-17 Annual FTR Auction weighted-average cleared prices (Dollars per MW): Planning period 2012 to 2013<sup>19</sup>**

Trade Type	Hedge Type	FTR Direction	Class Type			
			24-Hour	On Peak	Off Peak	All
Buy bids	Obligations	Counter Flow	(\$0.19)	(\$0.40)	(\$0.22)	(\$0.29)
		Prevailing Flow	\$0.53	\$0.66	\$0.43	\$0.55
		Total	\$0.40	\$0.31	\$0.18	\$0.26
	Options	Counter Flow	\$0.00	\$0.00	\$0.00	\$0.00
		Prevailing Flow	\$0.74	\$0.31	\$0.15	\$0.23
		Total	\$0.74	\$0.31	\$0.15	\$0.23
Self-scheduled bids	Obligations	Counter Flow	(\$0.30)	NA	NA	(\$0.30)
		Prevailing Flow	\$0.69	NA	NA	\$0.69
		Total	\$0.65	NA	NA	\$0.65
Buy and self-scheduled bids	Obligations	Counter Flow	(\$0.22)	(\$0.40)	(\$0.22)	(\$0.29)
		Prevailing Flow	\$0.65	\$0.66	\$0.43	\$0.59
		Total	\$0.58	\$0.31	\$0.18	\$0.34
	Options	Counter Flow	\$0.00	\$0.00	\$0.00	\$0.00
		Prevailing Flow	\$0.74	\$0.31	\$0.15	\$0.23
		Total	\$0.74	\$0.31	\$0.15	\$0.23
Sell offers	Obligations	Counter Flow	(\$0.53)	(\$0.31)	(\$0.20)	(\$0.26)
		Prevailing Flow	\$0.28	\$0.40	\$0.22	\$0.31
		Total	\$0.08	\$0.24	\$0.08	\$0.15
	Options	Counter Flow	NA	NA	NA	NA
		Prevailing Flow	\$0.00	\$0.37	\$0.17	\$0.31
		Total	\$0.00	\$0.37	\$0.17	\$0.31

Figure 12-6 shows the weighted-average cleared buy-bid price frequency for the 2012 to 2013 Annual FTR Auction and that 90.4 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 2012 to 2013 planning period FTR obligation price frequency for cleared buy bids shows that 89.5 percent of FTR buy bid obligations and 96.5 percent of FTR buy bid options were purchased for less than \$1 per MW.

**Figure 12-6 Annual FTR Auction clearing price per MW: Planning period 2012 to 2013**

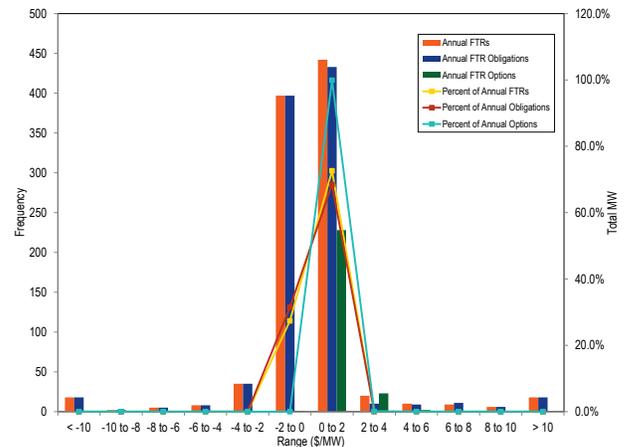


Table 12-18 shows the weighted-average cleared buy-bid price in the Monthly Balance of Planning Period FTR Auctions by bidding period for January 2012 through December 2012. For example, for the June 2012 Monthly Balance of Planning Period FTR Auction, the current month column is June, the second month 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 2012 Monthly Balance of Planning Period FTR Auction.

<sup>19</sup> Price data for the 2012 to 2013 Annual FTR Auction does not include FTRs directly allocated within the ATSI and DEOK Control Zones.

The cleared weighted-average price paid in the Monthly Balance of Planning Period FTR Auctions during the first seven months of the 2012 to 2013 planning period was \$0.12 per MW compared to \$0.10 per MW for the same time frame in the 2011 to 2012 planning period. The cleared weighted-average price paid for 2012 was \$0.11, up from \$0.10 for 2011.

**Table 12-18 Monthly Balance of Planning Period FTR Auction cleared, weighted-average, buy-bid price per period (Dollars per MW): January through December 2012**

Monthly Auction	Prompt Month	Second Month	Third Month	Q1	Q2	Q3	Q4	Total
Jan-12	\$0.10	\$0.14	\$0.04				\$0.13	\$0.11
Feb-12	\$0.10	\$0.09	\$0.11				\$0.16	\$0.11
Mar-12	\$0.06	\$0.13	\$0.11				\$0.01	\$0.07
Apr-12	\$0.08	\$0.15						\$0.08
May-12	\$0.11							\$0.11
Jun-12	\$0.11	\$0.20	\$0.16	\$0.30	\$0.10	\$0.17	\$0.10	\$0.14
Jul-12	\$0.09	\$0.11	\$0.03		\$0.09	\$0.12	\$0.08	\$0.09
Aug-12	\$0.10	\$0.09	\$0.09		\$0.08	\$0.19	\$0.10	\$0.11
Sep-12	\$0.08	\$0.15	\$0.11		\$0.06	\$0.18	\$0.13	\$0.11
Oct-12	\$0.09	\$0.14	\$0.04			\$0.18	\$0.11	\$0.11
Nov-12	\$0.09	\$0.15	\$0.15			\$0.26	\$0.14	\$0.14
Dec-12	\$0.09	\$0.17	\$0.16			\$0.38	\$0.13	\$0.15

## 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 actual revenue that an FTR holder receives 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 12-19 lists FTR profits by organization type and FTR direction for the period from January through December, 2012. 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 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. FTRs were profitable overall, with \$-7.6 million in profits for physical entities, of which \$151.3 million was from self-scheduled FTRs, and \$78.8 million for financial entities.

**Table 12-19 FTR profits by organization type and FTR direction: January through December 2012**

Organization Type	FTR Direction				All
	Prevailing Flow	Self Scheduled Prevailing Flow	Counter Flow	Self Scheduled Counter Flow	
Physical	(\$217,458,432)	\$148,975,735	\$58,491,863	\$2,356,793	(\$7,634,041)
Financial	(\$75,529,744)	NA	\$154,292,667	NA	\$78,762,923
Total	(\$292,988,176)	\$148,975,735	\$212,784,530	\$2,356,793	\$71,128,882

Table 12-20 lists the monthly FTR profits in 2012 by organization type.

**Table 12-20 Monthly FTR profits by organization type: January through December 2012**

Month	Organization Type			Total
	Physical	Self Scheduled FTRs	Financial	
Jan	(\$21,202,380)	\$14,779,795	\$3,981,524	(\$2,441,061)
Feb	(\$23,137,563)	\$13,247,875	\$7,491,849	(\$2,397,839)
Mar	(\$24,189,367)	\$12,778,994	\$4,873,661	(\$6,536,712)
Apr	(\$17,314,923)	\$11,004,118	\$11,848,177	\$5,537,372
May	(\$22,911,625)	\$11,306,839	\$13,000,958	\$1,396,172
Jun	(\$220,426)	\$839,141	\$173,901	\$792,616
Jul	(\$1,394,243)	\$18,497,143	\$7,160,965	\$24,263,866
Aug	(\$14,487,392)	\$16,807,177	\$3,281,077	\$5,600,862
Sep	(\$5,106,566)	\$16,795,363	\$13,936,777	\$25,625,574
Oct	(\$11,489,644)	\$12,386,162	\$6,364,575	\$7,261,092
Nov	(\$5,953,176)	\$11,979,982	\$4,521,332	\$10,548,138
Dec	(\$11,559,264)	\$10,909,938	\$2,128,126	\$1,478,800
Total	(\$158,966,569)	\$151,332,528	\$78,762,923	\$71,128,882

## Revenue

### Long Term FTR Auction Revenue

Table 12-21 shows the Long Term FTR Auction revenue data by trade type, FTR direction, period type and class type. The 2013 to 2016 Long Term FTR Auction netted \$28.6 million in revenue, \$8.1 million more than the previous Long Term FTR Auction. Buyers paid \$62.7 million and sellers received \$34.1 million, up \$8.3 million and \$0.3 million over the previous Long Term FTR Auction.

**Table 12-21 Long Term FTR Auction revenue: Planning periods 2013 to 2016**

Trade Type	FTR Direction	Period Type	Class Type			
			24-Hour	On Peak	Off Peak	All
Buy bids	Counter Flow	Year 1	(\$5,706,284)	(\$35,831,285)	(\$28,995,134)	(\$70,532,704)
		Year 2	(\$2,349,323)	(\$20,540,182)	(\$18,949,698)	(\$41,839,203)
		Year 3	(\$2,364,201)	(\$18,374,522)	(\$14,391,797)	(\$35,130,521)
		Year All	\$0	(\$377,197)	(\$505,873)	(\$883,070)
		Total	(\$10,419,808)	(\$75,123,187)	(\$62,842,503)	(\$148,385,497)
	Prevailing Flow	Year 1	\$12,341,292	\$53,723,120	\$35,976,381	\$102,040,793
		Year 2	\$5,305,552	\$30,670,166	\$23,466,587	\$59,442,305
		Year 3	\$3,458,467	\$27,018,434	\$18,074,490	\$48,551,391
		Year All	\$0	\$319,599	\$702,726	\$1,022,325
		Total	\$21,105,311	\$111,731,319	\$78,220,183	\$211,056,813
Total		\$10,685,504	\$36,608,132	\$15,377,680	\$62,671,316	
Sell offers	Counter Flow	Year 1	(\$935,293)	(\$3,249,168)	(\$2,567,347)	(\$6,751,808)
		Year 2	\$0	(\$1,291,866)	(\$1,208,534)	(\$2,500,400)
		Year 3	\$0	(\$333,864)	(\$270,553)	(\$604,418)
		Year All	NA	NA	NA	NA
		Total	(\$935,293)	(\$4,874,898)	(\$4,046,435)	(\$9,856,626)
	Prevailing Flow	Year 1	\$329,797	\$19,720,323	\$9,307,306	\$29,357,426
		Year 2	\$264,183	\$8,565,500	\$4,144,029	\$12,973,711
		Year 3	\$0	\$1,112,660	\$479,173	\$1,591,833
		Year All	NA	NA	NA	NA
		Total	\$593,980	\$29,398,482	\$13,930,508	\$43,922,970
Total		(\$341,313)	\$24,523,584	\$9,884,074	\$34,066,345	
Total		\$11,026,817	\$12,084,548	\$5,493,606	\$28,604,971	

For the 2013 to 2016 Long Term FTR Auction, the counter flow FTRs netted -\$138.5 million in revenue, down \$21.0 million, while prevailing flow FTRs netted \$167.1 million in revenue, up \$29.1 million from the previous Long Term FTR Auction.

Figure 12-7 summarizes total revenue associated with all FTRs, regardless of source, to FTR sinks that produced the largest positive and negative revenue from the 2013 to 2016 Long Term FTR Auction.<sup>20</sup> The top 10 positive revenue producing FTR sources accounted for \$69.6 million of the total revenue of \$28.5 million paid in the auction, they also comprised 7.1 percent of all FTRs bought in the auction. The top 10 negative revenue producing FTR sinks accounted for -\$41.3 million of revenue and constituted 4.1 percent of all FTRs bought in the auction.

<sup>20</sup> 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.

**Figure 12-7 Ten largest positive and negative revenue producing FTR sinks purchased in the Long Term FTR Auction: Planning periods 2013 to 2016**

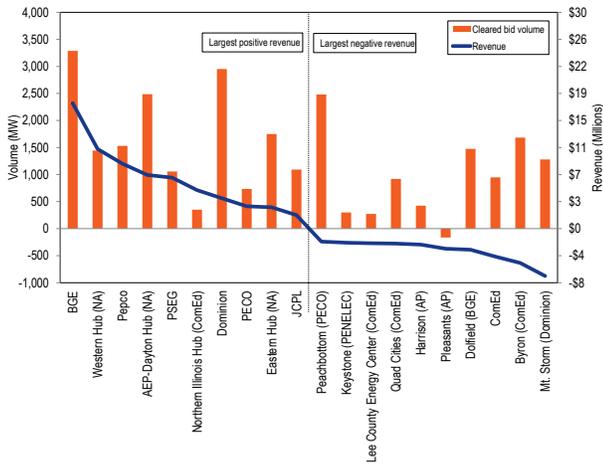
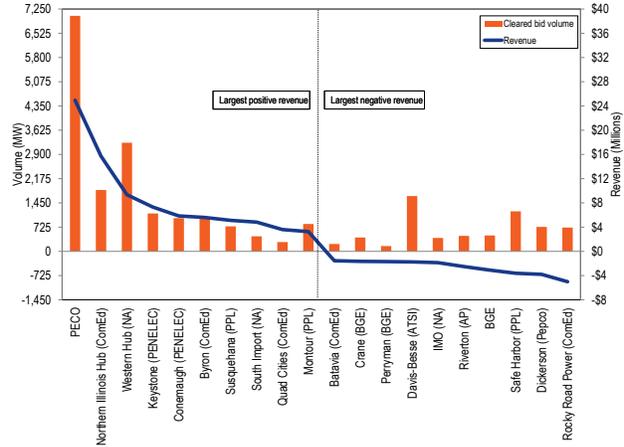


Figure 12-8 summarizes total revenue associated with all FTRs, regardless of sink, to FTR sources that produced the largest positive and negative revenue from the 2013 to 2016 Long Term FTR Auction.<sup>21</sup> The top 10 positive revenue producing FTR sources accounted for \$85.6 million of the total revenue of \$28.5 million paid in the auction, they also comprised 7.4 percent of all FTRs bought in the auction.<sup>22</sup> The top 10 negative revenue producing FTR sources accounted for -\$38.7 million of revenue and constituted 2.7 percent of all FTRs bought in the auction.

21 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.

22 The total positive revenue producing FTR sources was \$67.3 million and the total negative revenue producing FTR sinks was -\$38.7 million. The overall revenue paid in the auction was \$28.5 million.

**Figure 12-8 Ten largest positive and negative revenue producing FTR sources purchased in the Long Term FTR Auction: Planning periods 2013 to 2016<sup>23</sup>**



### Annual FTR Auction Revenue

Table 12-22 shows the Annual FTR Auction revenue data by trade type, hedge type, FTR direction and class type. The Annual FTR Auction for the 2012 to 2013 planning period generated \$602.9 million, down 41.4 percent from \$1,029.6 million in the 2011 to 2012 planning period. FTR buyers paid \$627.3 million, down \$440.9 million, and sellers received \$24.4 million, down \$14.2 million from the previous Annual FTR Auction.

For the 2012 to 2013 planning period, counter flow FTRs in the Annual FTR Auction netted -\$123.1 million, down \$59.2 million from the previous Annual Auction with buyers receiving \$134.9 million and sellers paying \$11.7 million. In the Annual FTR Auction prevailing flow buyers paid \$762.2 million and sellers received \$36.2 million. Counter flow FTR buyers are paid to take FTRs, so revenues are negative for buyers and positive for sellers.

23 For Figure 12-7 through Figure 12-14, 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 12-22 Annual FTR Auction revenue: Planning period 2012 to 2013

Trade Type	Type	FTR Direction	Class Type			
			24-Hour	On Peak	Off Peak	All
Buy bids	Obligations	Counter Flow	(\$5,370,727)	(\$73,472,255)	(\$52,027,158)	(\$130,870,140)
		Prevailing Flow	\$65,363,056	\$251,064,599	\$160,673,442	\$477,101,097
		Total	\$59,992,329	\$177,592,343	\$108,646,285	\$346,230,957
	Options	Counter Flow	\$0	\$0	\$0	\$0
		Prevailing Flow	\$1,286,535	\$25,658,484	\$15,913,602	\$42,858,621
		Total	\$1,286,535	\$25,658,484	\$15,913,602	\$42,858,621
Total	Counter Flow	(\$5,370,727)	(\$73,472,255)	(\$52,027,158)	(\$130,870,140)	
	Prevailing Flow	\$66,649,591	\$276,723,083	\$176,587,045	\$519,959,718	
	Total	\$61,278,864	\$203,250,827	\$124,559,887	\$389,089,578	
Self-scheduled bids	Obligations	Counter Flow	(\$4,001,799)	NA	NA	(\$4,001,799)
		Prevailing Flow	\$242,193,633	NA	NA	\$242,193,633
		Total	\$238,191,834	NA	NA	\$238,191,834
Buy and self-scheduled bids	Obligations	Counter Flow	(\$9,372,526)	(\$73,472,255)	(\$52,027,158)	(\$134,871,939)
		Prevailing Flow	\$307,556,690	\$251,064,599	\$160,673,442	\$719,294,730
		Total	\$298,184,163	\$177,592,343	\$108,646,285	\$584,422,791
	Options	Counter Flow	\$0	\$0	\$0	\$0
		Prevailing Flow	\$1,286,535	\$25,658,484	\$15,913,602	\$42,858,621
		Total	\$1,286,535	\$25,658,484	\$15,913,602	\$42,858,621
Total	Counter Flow	(\$9,372,526)	(\$73,472,255)	(\$52,027,158)	(\$134,871,939)	
	Prevailing Flow	\$308,843,224	\$276,723,083	\$176,587,045	\$762,153,351	
	Total	\$299,470,698	\$203,250,827	\$124,559,887	\$627,281,412	
Sell offers	Obligations	Counter Flow	(\$1,614,398)	(\$5,346,361)	(\$4,788,710)	(\$11,749,469)
		Prevailing Flow	\$2,650,769	\$22,966,327	\$10,249,618	\$35,866,714
		Total	\$1,036,371	\$17,619,966	\$5,460,908	\$24,117,244
	Options	Counter Flow	\$0	\$0	\$0	\$0
		Prevailing Flow	\$0	\$254,602	\$47,689	\$302,291
		Total	\$0	\$254,602	\$47,689	\$302,291
Total	Counter Flow	(\$1,614,398)	(\$5,346,361)	(\$4,788,710)	(\$11,749,469)	
	Prevailing Flow	\$2,650,769	\$23,220,929	\$10,297,306	\$36,169,005	
	Total	\$1,036,371	\$17,874,568	\$5,508,597	\$24,419,536	
Total		\$298,434,327	\$185,376,259	\$119,051,290	\$602,861,876	

Figure 12-9 summarizes total revenue associated with all FTRs, regardless of sink, to FTR sources that produced the largest positive and negative revenue from the 2012 to 2013 Annual FTR Auction.<sup>24</sup> The top 10 positive revenue producing FTR sources 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.<sup>25</sup> The top 10 negative revenue producing FTR sources accounted for -\$71.2 million of revenue and constituted 6.9 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 2012 to 2013

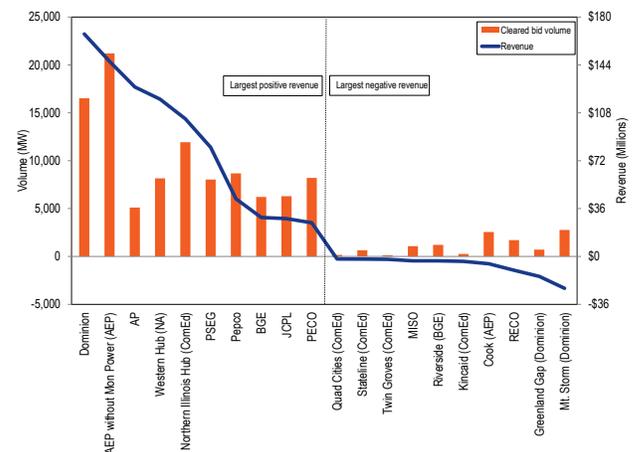


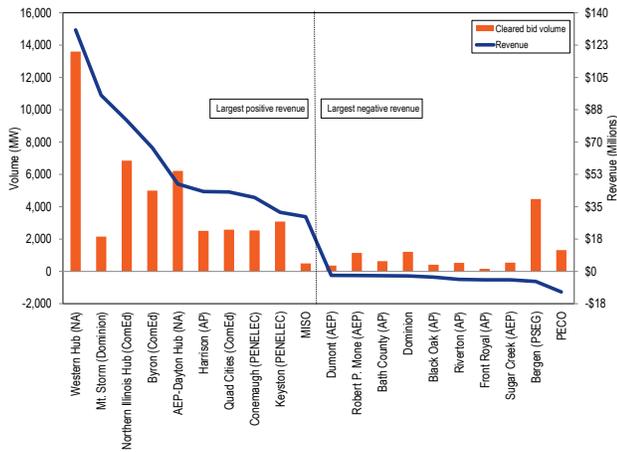
Figure 12-10 summarizes total revenue associated with all FTRs, regardless of source, to FTR sinks that produced the largest positive and negative revenue from the 2013

24 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.

25 The total positive revenue producing FTR sources was \$67.3 million and the total negative revenue producing FTR sinks was -\$38.7 million. The overall revenue paid in the auction was \$28.5 million.

to 2016 Annual FTR Auction.<sup>26</sup> The top 10 positive revenue producing FTR sources accounted for \$609.8 million of the total revenue of \$1,031.0 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 sinks accounted for -\$42.3 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 2012 to 2013**

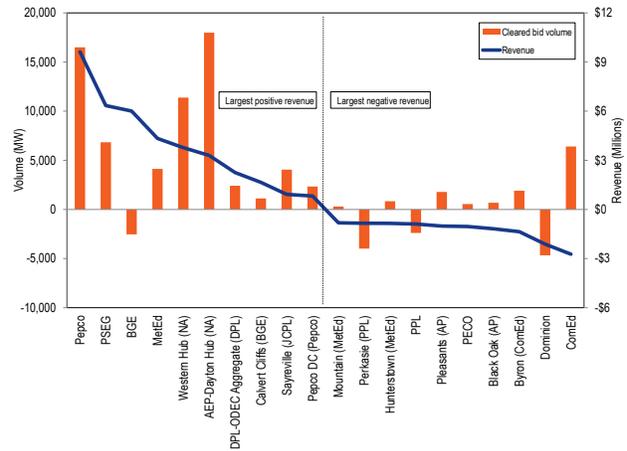


### Monthly Balance of Planning Period FTR Auction Revenue

Table 12-23 shows Monthly Balance of Planning Period FTR Auction revenue data by trade type, type and class type for January through December 2012. The Monthly Balance of Planning Period FTR Auction netted \$17.3 million in revenue, with buyers paying \$95.2 million and sellers receiving \$77.9 million. For the entire 2011 to 2012 planning period, the Monthly Balance of Planning Period FTR Auctions netted \$26.3 million in revenue with buyers paying \$132.6 million and sellers receiving \$106.4 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 2012 to 2013 planning period. The top 10 positive revenue producing FTR sinks accounted for \$39.0 million of the total revenue of \$17.3 million paid in the auction, they also comprised 6.7 percent of all FTRs bought in the auction. The top 10 negative revenue producing FTR sinks accounted for -\$12.9 million of revenue and constituted 0.1 percent of all FTRs bought in the auction.

**Figure 12-11 Ten largest positive and negative revenue producing FTR sinks purchased in the Monthly Balance of Planning Period FTR Auctions: Planning period 2012 to 2013**



<sup>26</sup> 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.

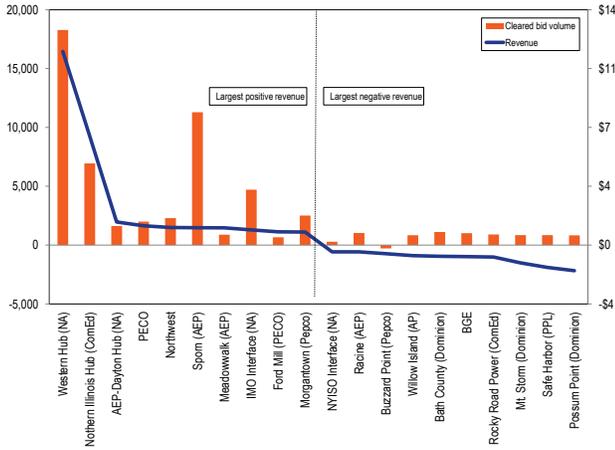
Table 12-23 Monthly Balance of Planning Period FTR Auction revenue: January through December 2012

Monthly Auction	Type	Trade Type	Class Type			
			24-Hour	On Peak	Off Peak	All
Jan-12	Obligations	Buy bids	\$524,730	\$3,220,163	\$2,694,130	\$6,439,023
		Sell offers	\$273,645	\$2,111,566	\$1,753,975	\$4,139,186
	Options	Buy bids	\$47,640	\$250,066	\$185,282	\$482,989
		Sell offers	\$3,520	\$1,158,143	\$803,885	\$1,965,548
Feb-12	Obligations	Buy bids	\$738,466	\$3,603,048	\$2,051,190	\$6,392,705
		Sell offers	\$157,900	\$3,038,310	\$1,577,337	\$4,773,546
	Options	Buy bids	\$0	\$289,791	\$229,111	\$518,902
		Sell offers	\$0	\$648,876	\$439,093	\$1,087,969
Mar-12	Obligations	Buy bids	\$52,294	\$2,878,603	\$1,411,063	\$4,341,960
		Sell offers	\$205,654	\$1,869,094	\$670,898	\$2,745,647
	Options	Buy bids	\$9,004	\$170,196	\$109,643	\$288,843
		Sell offers	\$0	\$613,978	\$496,981	\$1,110,960
Apr-12	Obligations	Buy bids	(\$103,515)	\$2,497,186	\$1,518,273	\$3,911,943
		Sell offers	\$261,819	\$1,380,449	\$742,304	\$2,384,572
	Options	Buy bids	\$0	\$66,944	\$50,134	\$117,078
		Sell offers	\$0	\$455,585	\$380,110	\$835,695
May-12	Obligations	Buy bids	\$331,445	\$1,959,349	\$1,414,983	\$3,705,777
		Sell offers	\$20,537	\$1,196,092	\$767,455	\$1,984,084
	Options	Buy bids	\$0	\$22,067	\$12,390	\$34,458
		Sell offers	\$4,435	\$569,872	\$486,239	\$1,060,545
Jun-12	Obligations	Buy bids	\$1,675,452	\$10,781,405	\$4,151,710	\$16,608,567
		Sell offers	\$374,681	\$6,390,257	\$1,919,494	\$8,684,433
	Options	Buy bids	\$64,800	\$685,972	\$578,673	\$1,329,445
		Sell offers	\$0	\$3,780,497	\$2,069,955	\$5,850,452
Jul-12	Obligations	Buy bids	(\$859,311)	\$9,916,659	\$3,550,156	\$12,607,505
		Sell offers	(\$849,209)	\$6,099,746	\$1,367,013	\$6,617,550
	Options	Buy bids	\$0	\$736,304	\$502,081	\$1,238,385
		Sell offers	\$0	\$2,857,593	\$1,792,063	\$4,649,656
Aug-12	Obligations	Buy bids	\$48,011	\$8,111,495	\$4,740,753	\$12,900,258
		Sell offers	\$32,573	\$4,002,172	\$1,840,346	\$5,875,091
	Options	Buy bids	\$965	\$752,557	\$296,514	\$1,050,035
		Sell offers	\$5,087	\$2,340,565	\$1,958,938	\$4,304,590
Sep-12	Obligations	Buy bids	(\$608,953)	\$8,762,531	\$4,088,277	\$12,241,856
		Sell offers	\$436,202	\$4,077,427	\$1,414,673	\$5,928,301
	Options	Buy bids	\$1,436	\$650,310	\$336,001	\$987,746
		Sell offers	\$0	\$3,190,050	\$1,947,586	\$5,137,636
Oct-12	Obligations	Buy bids	\$170,435	\$6,714,889	\$3,496,860	\$10,382,184
		Sell offers	\$187,897	\$3,665,626	\$1,540,352	\$5,393,876
	Options	Buy bids	\$0	\$238,541	\$212,202	\$450,742
		Sell offers	\$0	\$2,118,759	\$1,451,870	\$3,570,629
Nov-12	Obligations	Buy bids	(\$555,956)	\$7,052,316	\$4,982,409	\$11,478,770
		Sell offers	\$2,932,597	\$2,214,344	\$1,513,456	\$6,660,397
	Options	Buy bids	\$16,567	\$197,934	\$147,344	\$361,845
		Sell offers	\$278,683	\$1,506,825	\$1,605,097	\$3,390,604
Dec-12	Obligations	Buy bids	(\$206,407)	\$6,937,534	\$6,297,431	\$13,028,558
		Sell offers	\$420,872	\$4,227,841	\$3,644,941	\$8,293,654
	Options	Buy bids	\$0	\$301,266	\$194,916	\$496,182
		Sell offers	\$29,550	\$1,653,241	\$1,821,150	\$3,503,940
2011/2012*	Obligations	Buy bids	\$11,022,879	\$70,675,860	\$43,198,742	\$124,897,481
		Sell offers	\$4,694,451	\$44,380,545	\$26,582,133	\$75,657,129
	Options	Buy bids	\$117,492	\$4,428,304	\$3,191,765	\$7,737,562
		Sell offers	\$14,172	\$18,614,021	\$12,092,649	\$30,720,842
Total		\$6,431,748	\$12,109,598	\$7,715,726	\$26,257,072	
2012/2013**	Obligations	Buy bids	(\$336,729)	\$58,276,830	\$31,307,596	\$89,247,698
		Sell offers	\$3,535,614	\$30,677,412	\$13,240,275	\$47,453,302
	Options	Buy bids	\$83,767	\$3,562,883	\$2,267,731	\$5,914,381
		Sell offers	\$313,319	\$17,447,531	\$12,646,657	\$30,407,507
Total		(\$4,101,895)	\$13,714,770	\$7,688,395	\$17,301,270	

\* Shows Twelve Months for 2011/2012; \*\* Shows seven months ended 31-Dec-2012 for 2012/2013

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 2012 to 2013 planning period. The top 10 positive revenue producing FTR sources accounted for \$26.1 million of the total revenue of \$25.9 million paid in the auction, they also comprised 3.3 percent of all FTRs bought in the auction. The top 10 negative revenue producing FTR sinks accounted for -\$7.9 million of revenue and constituted 0.5 percent of all FTRs bought in the auction.

**Figure 12-12 Ten largest positive and negative revenue producing FTR sources purchased in the Monthly Balance of Planning Period FTR Auctions: Planning period 2012 to 2013**



### FTR Target Allocations

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 2012 to 2013 planning period through December 31, 2012. Figure 12-13 shows the ten largest positive and negative FTR target allocations, summed by sink, for the 2012 to 2013 planning period. The top 10 sinks that produced financial benefit accounted for 21.7 percent of total positive target allocations during the first seven months of the 2012 to 2013 planning period with the Northern Illinois Hub accounting for 5.5 percent of all positive target allocations. The top 10 sinks that created liability accounted for 10.2 percent of total negative target allocations with Quad Cities 2 accounting for 2.0 percent of all negative target allocations.

**Figure 12-13 Ten largest positive and negative FTR target allocations summed by sink: Planning period 2012 to 2013**

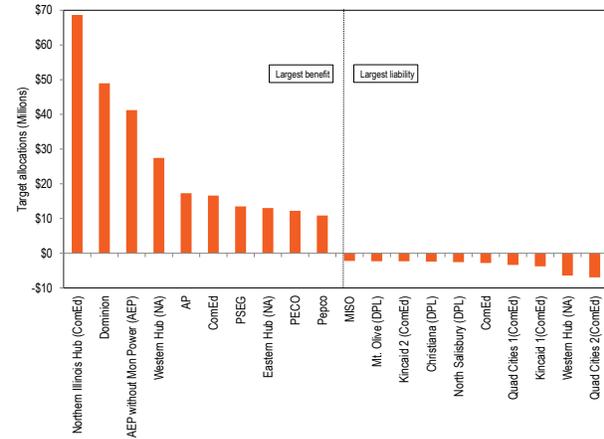
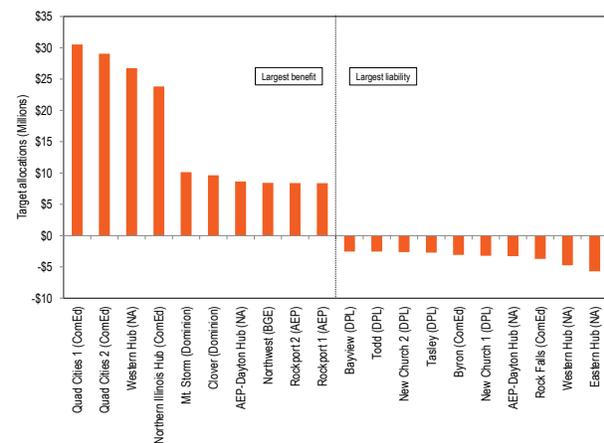


Figure 12-14 shows the ten largest positive and negative FTR target allocations, summed by source, for the 2012 to 2013 planning period. The top 10 sources with a positive target allocation accounted for 13.2 percent of total positive target allocations with Quad Cities 1 accounting for 2.5 percent of total positive target allocations. The top 10 sources with a negative target allocation accounted for 10.0 percent of all negative target allocations, with the Eastern Hub accounting for 1.7 percent.

**Figure 12-14 Ten largest positive and negative FTR target allocations summed by source: Planning period 2012 to 2013**



## 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.<sup>27</sup> That is the source of the congestion revenue to pay holders of ARRs and FTRs. In general, FTR revenue adequacy exists when the sum of congestion credits is equal to or greater than the sum of congestion across the positively valued FTRs. If PJM allocated FTRs equal to the transmission capability into constrained areas, FTR payouts would equal the sum of congestion.

Revenue adequacy must be distinguished from the adequacy of FTRs as an offset against total congestion. Revenue adequacy is a narrower concept that compares total congestion revenues to the total target allocations across the specific paths for which FTRs were available and purchased. A path specific target allocation is not a guarantee of payment. 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.

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 2011 to 2012 planning period, FTRs were not fully funded and thus an uplift charge was collected.

FTR revenues are primarily comprised of hourly congestion revenue, from the day ahead and balancing markets, and net negative congestion.<sup>28</sup> 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 12-24 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.<sup>29</sup> 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 payment of \$0.8 million in congestion charges to Con Edison in the 2011 to 2012 planning period.<sup>30,31</sup>

Congestion charges were made to the Day Ahead Operating Reserves in October 2012. 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.

<sup>27</sup> 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."

<sup>28</sup> Hourly congestion revenues may be negative.

<sup>29</sup> See "Joint Operating Agreement between the Midwest Independent System Operator, Inc. and PJM Interconnection, LLC." (December 11, 2008), Section 6.1 <<http://www.pjm.com/-/Media/documents/agreements/joa-complete.aspx>> (Accessed March 13, 2012)

<sup>30</sup> 111 FERC ¶ 61,228 (2005).

<sup>31</sup> 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."

FTRs were paid at 74.8 percent of the target allocation level for the first seven months of the 2012 to 2013 planning period. Congestion revenues are allocated to FTR holders based on FTR target allocations. PJM collected \$335.1 million of FTR revenues during the first seven months of the 2012 to 2013 planning period, and \$569.1 million during the first seven months of the 2011 to 2012 planning period, a 41.1 percent decrease. For the first seven months of the 2012 to 2013 planning period, the top sink and top source with the highest positive FTR target allocations were the Northern Illinois Hub and Quad Cities 1. Similarly, the top sink and top source with the largest negative FTR target allocations were Quad Cities 2 and the Eastern Hub.

Table 12-24 presents the PJM FTR revenue detail for the 2011 to 2012 planning period and the first seven months of the 2012 to 2013 planning period.

**Table 12-24 Total annual PJM FTR revenue detail (Dollars (Millions)): Planning periods 2011 to 2012 and 2012 to 2013 through December 31, 2012**

Accounting Element	2011/2012	2012/2013**
<b>ARR information</b>		
ARR target allocations	\$982.9	\$343.8
FTR auction revenue	\$1,091.8	\$379.4
ARR excess	\$108.9	\$35.6
<b>FTR targets</b>		
FTR target allocations	\$992.8	\$442.6
<b>Adjustments:</b>		
Adjustments to FTR target allocations	(\$1.1)	(\$0.6)
Total FTR targets	\$991.7	\$442.0
<b>FTR revenues</b>		
ARR excess	\$108.9	\$35.6
Competing uses	\$0.1	\$0.1
<b>Congestion</b>		
Net Negative Congestion (enter as negative)	(\$64.5)	(\$47.1)
Hourly congestion revenue	\$835.5	\$371.2
Midwest ISO M2M (credit to PJM minus credit to Midwest ISO)	(\$79.6)	(\$24.7)
Consolidated Edison Company of New York and Public Service Electric and Gas Company Wheel (CEPSW) congestion credit to Con Edison (enter as negative)	(0.2)	\$0.0
<b>Adjustments:</b>		
Excess revenues carried forward into future months	\$0.0	\$0.0
Excess revenues distributed back to previous months	\$0.0	\$0.0
Other adjustments to FTR revenues	(\$0.8)	(\$0.0)
Total FTR revenues	\$799.4	\$335.1
Excess revenues distributed to other months	\$0.0	\$0.0
Net Negative Congestion charged to DA Operating Reserves	\$0.0	\$0.6
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	\$799.4	\$335.7
Total congestion credits on bill (includes CEPSW and end-of-year distribution)	\$799.6	\$335.7
Remaining deficiency	\$192.3	\$106.3

\*\* Shows seven month ended 31-Dec-12

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 12-25 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 12-25 is not the 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.

Table 12-25 Monthly FTR accounting summary (Dollars (Millions)): Planning periods 2011 to 2012 and 2012 to 2013

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-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	\$70.6	\$73.4	96.2%	\$70.6	96.2%	(\$2.8)
Sep-11	\$69.4	\$88.3	78.6%	\$69.4	78.7%	(\$18.8)
Oct-11	\$37.5	\$52.3	73.0%	\$37.5	71.7%	(\$14.8)
Nov-11	\$32.8	\$57.1	57.4%	\$32.8	57.4%	(\$24.4)
Dec-11	\$46.4	\$64.8	71.6%	\$46.4	71.6%	(\$18.4)
Jan-12	\$49.4	\$61.8	79.8%	\$49.4	80.0%	(\$12.4)
Feb-12	\$38.4	\$57.4	66.8%	\$38.4	66.8%	(\$19.0)
Mar-12	\$48.3	\$57.8	84.2%	\$48.3	83.6%	(\$9.5)
Apr-12	\$40.6	\$73.6	55.3%	\$40.6	55.2%	(\$32.9)
May-12	\$53.1	\$69.3	76.7%	\$53.1	76.6%	(\$16.2)
Summary for Planning Period 2011 to 2012						
Total	\$799.4	\$991.7		\$799.4	80.6%	(\$192.3)
Jun-12	\$58.5	\$62.9	92.9%	\$58.5	92.9%	(\$4.5)
Jul-12	\$71.3	\$80.1	88.9%	\$71.3	88.9%	(\$8.9)
Aug-12	\$54.1	\$55.6	97.1%	\$54.1	97.3%	(\$1.5)
Sep-12	\$38.7	\$82.8	46.7%	\$38.7	46.8%	(\$44.1)
Oct-12	\$24.3	\$58.2	41.8%	\$24.9	42.7%	\$33.3
Nov-12	\$52.0	\$55.5	93.8%	\$52.0	93.8%	\$3.4
Dec-12	\$36.3	\$47.2	76.9%	\$36.3	76.9%	\$10.9
Summary for Planning Period 2012 to 2013						
Total	\$335.1	\$442.4		\$335.7	75.9%	(\$106.6)

Figure 12-15 shows the original FTR payout ratio with adjustments by month, excluding excess revenue distribution, for January 2004 through December 2012. The months with payout ratios above 100 percent are overfunded and the months with payout ratios under 100 percent are underfunded. Figure 12-15 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 2012 to 2013 planning period may change if excess revenue is collected in the remainder of the planning period.

Figure 12-15 FTR payout ratio with adjustments by month, excluding and including excess revenue distribution: January 2004 through December 2012

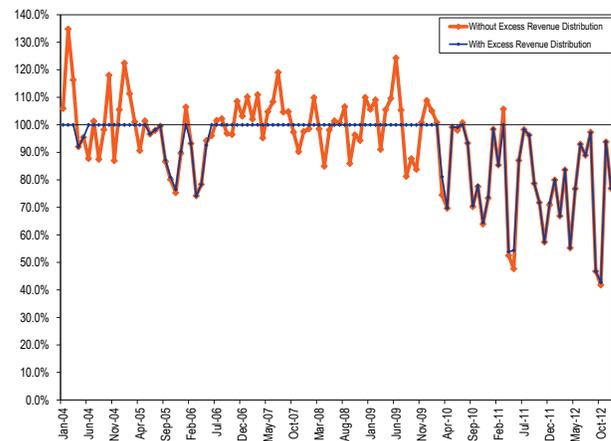


Table 12-26 shows the FTR payout ratio by planning period from the 2003 to 2004 planning period forward.

**Table 12-26 Reported 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	80.6%
2012/2013*	74.8%

\*2012/2013 Through 31-Dec-12

## Revenue Adequacy Issues and Solutions

### Reported Payout Ratio

The payout ratios shown above in Table 12-26 reflect the reported payout ratios for the planning period. These reported payout ratios equal congestion revenue divided by the sum of the net positive and net negative target allocations for each hour. But this does not correctly measure the payout ratio actually received by positive target allocation FTR holders. The payout ratio is intended to measure the proportion of the target allocation received by the holders of FTRs with positive target allocations in an hour. In fact, the actual payout ratio includes the net negative target allocations as a source of funding for FTRs with net positive target allocations in an hour. Revenue from FTRs with net negative target allocations in an hour are included with congestion revenue when funding FTRs with net positive target allocations.<sup>32</sup> The actual payout ratio received by FTR holders equals congestion revenue plus the net negative target allocations divided by the net positive target allocations for each hour. The actual payout ratio received by the holders of positive target allocation FTRs is greater than reported by PJM.

Table 12-27 shows the reported and actual payout ratio for each month and the calendar year 2012. In September the reported payout ratio is 8.8 percentage points below the actual payout ratio. For 2012 the reported payout ratio is 3.4 percentage points below the actual payout ratio. For 2012 the reported payout ratio

is 73.5 percent while the correctly calculated payout ratio is 76.9 percent.

**Table 12-27 Reported and Actual Payout Ratios for 2012**

	Reported Payout Ratio	Actual Payout Ratio
Jan-12	80.1%	82.3%
Feb-12	66.9%	71.2%
Mar-12	83.6%	86.7%
Apr-12	55.2%	62.7%
May-12	76.7%	79.6%
Jun-12	92.9%	93.6%
Jul-12	88.9%	90.0%
Aug-12	97.3%	97.5%
Sep-12	46.8%	55.6%
Oct-12	41.8%	50.2%
Nov-12	87.2%	88.5%
Dec-12	72.2%	74.6%
Total	73.5%	76.9%

### Netting Target Allocations within Portfolios

Currently FTR target allocations are netted within each organization in each hour. This means that within an hour, positive and negative target allocations within an organization's portfolio are offset prior to the application of the payout ratio to the positive target allocation FTRs. The payout ratios are also calculated based on these net FTR positions.

The current method requires those with fewer negative target allocation FTRs to subsidize those with more negative target allocation FTRs. The current method treats a positive target allocation FTR differently depending on the portfolio of which it is a part. The correct method would treat all FTRs with positive target allocations exactly the same, which would eliminate this form of cross subsidy.

For example, a participant has \$200 of positive target allocation FTRs and \$100 of negative target allocation FTRs and the payout ratio is 80 percent. Under the current method, the positive and negative positions are first netted to \$100 and then the payout ratio is applied. In this example, the holder of the portfolio would receive 80 percent of \$100, or \$80.

The correct method would first apply the payout ratio to FTRs with positive target allocations and then net FTRs with negative target allocations. In the example, the 80 percent payout ratio would first be applied to the positive target allocation FTRs, 80 percent of \$200 is \$160. Then the negative target allocation FTRs would be netted against the positive target allocation FTRs, \$160

<sup>32</sup> See PJM, "Manual 28: Operating Agreement Accounting," Revision 56 (October 1, 2012), p. 50

minus \$100, so that the holder of the portfolio would receive \$60.

In fact, if done correctly, the payout ratio would also change, although the total net payments made to or from participants would not change. The sum of all positive and negative target allocations is the same in both methods. The net result of this change would be that holders of portfolios with smaller shares of negative target allocation FTRs would no longer subsidize holders of portfolios with larger shares of negative target allocation FTRs.

Under the current system all participants with a net positive target allocation in a month are paid a payout ratio based on each participant's net portfolio position. The correct approach would calculate payouts to FTRs with positive target allocations, without netting in an hour. This would treat all FTRs the same, regardless of a participant's portfolio. This approach would also eliminate the requirement that participants with larger shares of positive target allocation FTRs subsidize participants with larger shares of negative target allocation FTRs.

Table 12-28 shows an example of the effects of calculating FTR payouts on a per FTR basis rather than the current method of portfolio netting for four hypothetical organizations for an example hour. The positive and negative TA columns show the total positive and negative target allocations, calculated separately, for each organization. The percent negative target allocations is the share of the portfolio which is negative target allocation FTRs. The net TA is the net of the positive and negative target allocations for the given hour. The FTR netting payout column shows what a participant would see on their bill, including payout ratio adjustments, under the current method. The per FTR payout column shows what a participant would see on their bill, including payout ratio adjustments, if FTR target allocations were done correctly.

This table shows the effects of a per FTR target allocation calculation on individual participants. The total payout does not change, but the allocation across individual participants does.

The largest change in payout is for participants 1 and 2. Participant 1, who has a large proportion of FTRs with negative target allocations, receives less payment. Participant 2, who has no negative target allocations, receives more payment.

**Table 12-28 Example of FTR payouts from portfolio netting and without portfolio netting**

Participant	Positive TA	Negative TA	Percent Negative TA	Net TA	FTR Netting Payout (Current)	No Netting Payout (Proposed)	Percent Change
1	\$60.00	(\$40.00)	66.7%	\$20.00	\$8.33	(\$3.33)	(140.0%)
2	\$30.00	\$0.00	0.0%	\$30.00	\$12.50	\$18.33	46.7%
3	\$90.00	(\$20.00)	22.2%	\$70.00	\$29.17	\$35.00	20.0%
4	\$0.00	(\$5.00)	100.0%	(\$5.00)	(\$5.00)	(\$5.00)	0.0%
Total	\$180.00	(\$65.00)		\$115.00	\$45.00	\$45.00	

Table 12-29 shows the total value in 2012 of FTRs with positive and negative target allocations. The Net Positive Target Allocation column shows the value of all portfolios with an hourly net positive value after negative target allocation FTRs are netted against positive target allocation FTRs. The Net Negative Target Allocation column shows the value of all portfolios with an hourly net negative value after negative target allocation FTRs are netted against positive target allocation FTRs. The Per FTR Positive Allocation column shows the total value of the hourly positive target allocation FTRs without netting. The Per Negative Allocation column shows the total value of the hourly negative target allocation FTRs without netting.

The Reported Payout Ratio column is the payout ratio as currently reported by PJM, calculated as total revenue divided by the sum of the net positive and net negative target allocations. The No Netting FTR Payout Ratio column is the payout ratio that participants with positive target allocations would receive if FTR payouts were calculated without portfolio netting, calculated by dividing the total revenue minus the per FTR negative target allocation by the per FTR positive target allocations. The total revenue available to fund the holders of positive target allocation FTRs is calculated by adding any negative target allocations to the congestion credits for that month.

If netting within portfolios were eliminated and the payout ratio were calculated correctly, the payout ratio in 2012 would have been 88.1 percent instead of the reported 73.5 percent.

**Table 12-29 Monthly positive and negative target allocations and payout ratios with and without hourly netting in 2012**

	Net Positive Target Allocations	Net Negative Target Allocations	Per FTR Positive Target Allocations	Per FTR Negative Target Allocations	Total Congestion Revenue	Reported Payout Ratio (Current)	No Netting Payout Ratio (Proposed)
Jan-12	\$69,520,143	(\$7,730,433)	\$126,702,422	(\$64,766,863)	\$49,465,924	80.1%	90.2%
Feb-12	\$66,139,499	(\$8,722,011)	\$124,792,575	(\$67,369,848)	\$38,390,571	66.9%	84.7%
Mar-12	\$71,521,584	(\$13,706,751)	\$147,644,281	(\$89,829,450)	\$48,331,587	83.6%	93.6%
Apr-12	\$88,301,660	(\$14,712,532)	\$190,422,018	(\$116,820,311)	\$40,645,388	55.2%	82.7%
May-12	\$79,061,876	(\$9,760,027)	\$177,551,934	(\$108,239,496)	\$53,188,585	76.7%	90.9%
Jun-12	\$69,557,299	(\$6,623,560)	\$121,217,938	(\$58,280,956)	\$58,463,402	92.9%	96.3%
Jul-12	\$89,179,225	(\$9,034,200)	\$173,602,611	(\$93,421,963)	\$71,254,665	88.9%	94.9%
Aug-12	\$60,694,118	(\$5,115,960)	\$111,642,193	(\$55,976,928)	\$54,064,320	97.3%	98.6%
Sep-12	\$99,154,010	(\$16,477,176)	\$179,647,915	(\$96,844,326)	\$38,699,241	46.8%	75.4%
Oct-12	\$68,051,707	(\$9,827,426)	\$137,698,279	(\$79,454,756)	\$24,321,860	41.8%	75.4%
Nov-12	\$66,233,739	(\$6,557,217)	\$124,142,020	(\$64,424,379)	\$52,049,442	87.2%	93.8%
Dec-12	\$54,866,078	(\$4,610,245)	\$110,328,974	(\$59,848,711)	\$36,295,666	72.2%	87.1%
Total	\$882,280,937	(\$112,877,538)	\$1,725,393,160	(\$955,277,987)	\$565,170,652	73.5%	88.1%

### Counter Flow FTRs and Revenues

The current rules create an asymmetry between the treatment of counter flow and prevailing flow FTRs. Counter flow FTR holders make payments over the planning period, in the form of negative target allocations. These negative target allocation FTRs are paid at 100 percent regardless of whether positive target allocation FTRs are paid at less than 100 percent.

A counter flow FTR is profitable if the hourly negative target allocation is smaller than the hourly auction payment they received. A prevailing flow FTR is profitable if the hourly positive target allocation is larger than the auction payment they made.

For a prevailing flow FTR, the target allocation would be subject to a reduced payout ratio, while a counter flow FTR holder would not be subject to the reduced payout ratio. The profitability of the prevailing flow FTRs is affected by the payout ratio while the profitability of the counter flow FTRs is not affected by the payout ratio.

There is no reason to treat counter flow FTRs more favorably than prevailing flow FTRs. Counter flow FTRs should also be affected when the payout ratio is less than 100 percent. This would mean that counter flow FTRs would pay back an increased amount that mirrors the decreased payments to prevailing flow FTRs. The adjusted payout ratio would evenly divide the burden of underfunding among counter flow FTR holders and prevailing flow FTR holders by increasing negative counter flow target allocations by the same amount it decreases positive target allocations. This increased payout ratio would apply only to negative target allocations associated with counter flow FTRs.

Table 12-30 shows the monthly positive, negative and total target allocations.<sup>33</sup> Table 12-30 also shows the total congestion revenue available to fund FTRs, as well as the total revenue available to fund positive target allocation FTR holders on a per FTR basis and on a per FTR basis with counter flow payout adjustments. Implementing this change to the payout ratio for counter flow FTRs would result in an additional \$53.9 million in revenue available to fund positive target allocations.

The result of removing portfolio netting and applying a payout ratio to counter flow FTRs would increase the calculated payout ratio in 2012 from the reported 73.5 percent to 91.2 percent.

<sup>33</sup> Reported payout ratio may differ between Table 12-27 and Table 12-28 due to rounding differences when netting target allocations and considering each FTR individually.

Table 12-30 Counter flow FTR payout ratio adjustment impacts

	Positive Target Allocations	Negative Target Allocations	Total Target Allocations	Total Congestion Revenue	Reported Payout Ratio*	Total Revenue Available	Adjusted Counterflow Payout Ratio	Adjusted Counter Flow Revenue Available
Jan-12	\$126,702,422	(\$64,766,863)	\$61,935,560	\$49,465,924	79.9%	\$114,232,786	92.6%	\$117,367,780
Feb-12	\$124,792,575	(\$67,369,848)	\$57,422,727	\$38,390,571	66.9%	\$105,760,419	88.7%	\$110,681,339
Mar-12	\$147,644,281	(\$89,829,450)	\$57,814,831	\$48,331,587	83.6%	\$138,161,037	95.2%	\$140,519,040
Apr-12	\$190,422,018	(\$116,820,310)	\$73,601,707	\$40,645,388	55.2%	\$157,465,699	87.0%	\$165,641,014
May-12	\$177,551,934	(\$108,239,496)	\$69,312,438	\$53,188,585	76.7%	\$161,428,081	93.3%	\$165,734,697
Jun-12	\$121,217,938	(\$58,280,956)	\$62,936,981	\$58,463,402	92.9%	\$116,744,359	97.1%	\$117,660,567
Jul-12	\$173,602,611	(\$93,421,963)	\$80,180,649	\$71,254,665	88.9%	\$164,676,628	96.1%	\$166,755,703
Aug-12	\$111,642,193	(\$55,976,928)	\$55,665,265	\$54,064,320	97.1%	\$110,041,248	98.9%	\$110,403,489
Sep-12	\$179,647,915	(\$96,844,326)	\$82,803,589	\$38,699,241	46.7%	\$135,543,567	82.3%	\$147,775,239
Oct-12	\$137,698,279	(\$79,454,756)	\$58,243,523	\$24,321,860	41.8%	\$103,776,616	82.5%	\$113,612,324
Nov-12	\$124,142,020	(\$64,424,379)	\$59,717,640	\$52,049,442	87.2%	\$116,473,822	95.3%	\$118,341,423
Dec-12	\$110,328,974	(\$59,848,711)	\$50,480,263	\$36,295,666	71.9%	\$96,144,377	90.5%	\$99,840,410
Total	\$1,725,393,160	(\$955,277,987)	\$770,115,174	\$565,170,652	73.4%	\$1,520,448,638	91.2%	\$1,574,333,025

\* Reported payout ratios may vary due to rounding differences when netting

Figure 12-16 shows the FTR surplus, collected day-ahead, balancing and total congestion payments from January 2005 through December 2012.

Figure 12-16 FTR Surplus and the collected Day-Ahead, Balancing and Total congestion: January 2005 through December 2012

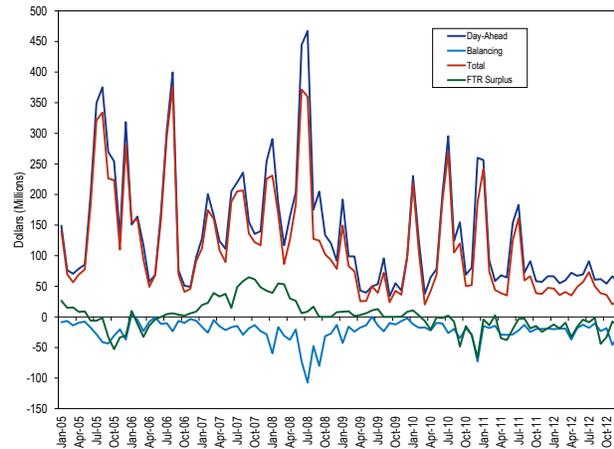
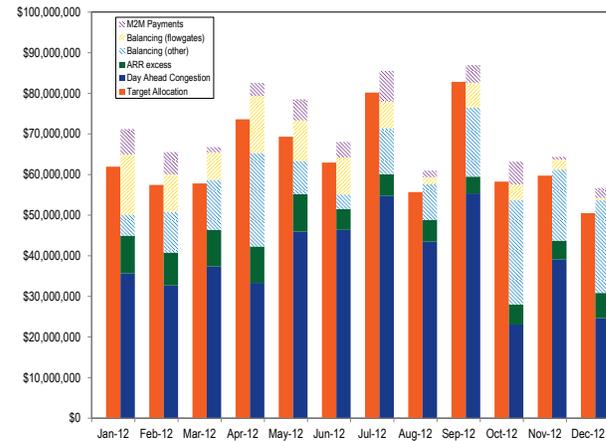


Figure 12-17 shows the monthly target allocation compared to the available positive and negative congestion revenue. The solid orange bar on the left of each month shows the monthly target allocation for all FTRs. The bar on the right of each month shows the positive and negative congestion dollars available to fund target allocations. The total height of the bar corresponds to total Day-Ahead congestion. Striped areas on this bar represent charges that reduce revenue and solid areas represent additions to revenue.

Figure 12-17 shows the relationship among balancing congestion, M2M payments and day-ahead congestion.

In the beginning of the year balancing congestion from flowgates comprised a majority of the total balancing congestion, but towards the end of the year it became a smaller proportion of total balancing congestion.

Figure 12-17 FTR target allocation compared to sources of positive and negative congestion revenue



## 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.<sup>34</sup> These price differences are based on the bid prices of participants in the Annual FTR Auction. The auction clears the set of feasible FTR bids which produce the highest net revenue. ARR revenues are a function of

<sup>34</sup> 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.

FTR auction participants' expectations of locational congestion price differences and the associated level of revenue sufficiency.

ARRs are available only as obligations (not options) and only as the 24-hour product. 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 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.

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.<sup>35</sup> 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.

## 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 2012 to 2013 planning period, all eligible market participants were allocated ARRs.

## 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 are shown 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.<sup>36</sup> Long Term ARRs can give LSEs the ability to hedge their congestion costs on a long-term basis. Long Term ARR holders can self schedule their Long Term ARRs as FTRs for any planning period during the 10 planning period timeline.

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

<sup>35</sup> 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/ftr/annual-arr-allocation/2011-2012/iarrs-rtep-upgrades-allocated-for-2011-12-planning-period.ashx>>.

<sup>36</sup> 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.

- 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 ARRs cannot be prorated. If Stage 1A ARRs are found to be infeasible, transmission system upgrades must be undertaken to maintain feasibility.<sup>37</sup>
- Stage 1B.** ARRs unallocated in Stage 1A are available in the Stage 1B allocation for the following planning period. 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.** Stage 2 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.<sup>38</sup> 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.<sup>39</sup>

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 can support the approved set of ARRs. 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.<sup>40</sup> 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

$$\text{Individual prorated MW} = (\text{Constraint capability}) \times \left( \frac{\text{Individual requested MW}}{\text{Total requested MW}} \right) \times (1 / \text{MW effect on line}).^{41}$$

The effect of an ARR request on a binding constraint is measured using the ARR's power flow distribution

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

39 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.

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

41 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.

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

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 only of ARRs that cause the greatest flows on the binding constraint. Were all ARR requests prorated equally, regardless of their proportional impact on the binding constraints, the result would be a significant reduction in market participants' ARRs.

Table 12-31 shows the top 10 principal binding transmission constraints, along with their corresponding control zones, in order of severity that limited the 2012 to 2013 ARR allocation. The order of severity is determined by the violation degree of the binding constraint as computed in the simultaneous feasibility test and provides a measurement of the MW that a constraint is over the limit. For the 2012 to 2013 ARR Stage 1A allocation PJM was required to increase the capability limits above their actual ratings for several facilities in order to make the ARR allocation feasible.<sup>42</sup>

**Table 12-31 Top 10 principal binding transmission constraints limiting the annual ARR allocation: Planning period 2012 to 2013**

Constraint	Type	Control Zone
Pleasant Prairie - Zion	Flowgate	MISO
Breed - Wheatland	Flowgate	MISO
Silver Lake	Transformer	ComEd
Oak Grove - Galesburg	Flowgate	MISO
Kenosha - Lakeview	Flowgate	MISO
Nucor - Whitestown	Flowgate	MISO
South Mahwah - Waldwick	Line	PSEG
Belvidere - Woodstock	Line	ComEd
East Frankfort - Braidwood	Line	ComEd
Pleasant Valley - Crystal Lake	Line	ComEd

## 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 ARRs that sink into a given control or load aggregation zone is automatically reassigned to follow that load.<sup>43</sup> 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.

There were 22,543 MW of ARRs associated with approximately \$226,900 of revenue that were reassigned in the first seven months of the 2012 to 2013 planning period. There were 41,770 MW of ARRs associated with approximately \$758,900 of revenue that were reassigned for the full twelve months of the 2011 to 2012 planning period.

Table 12-32 summarizes ARR MW and associated revenue automatically reassigned for network load in each control zone where changes occurred between June 2011 and December 2012.

**Table 12-32 ARRs and ARR revenue automatically reassigned for network load changes by control zone: June 1, 2011, through December 31, 2012**

Control Zone	ARRs Reassigned (MW-day)		ARR Revenue Reassigned [Dollars (Thousands) per MW-day]	
	2011/2012 (12 months)	2012/2013 (7 months)*	2011/2012 (12 months)	2012/2013 (7 months)*
AECO	563	287	\$4.8	\$1.5
AEP	6,341	2,249	\$119.0	\$27.9
AP	5,516	2,660	\$319.4	\$63.2
ATSI	3,321	2,246	\$13.3	\$4.1
BGE	2,745	1,278	\$45.9	\$15.2
ComEd	3,804	4,225	\$59.1	\$60.7
DAY	463	260	\$0.6	\$0.4
DEOK	NA	1,116	NA	\$0.6
DLCO	2,964	1,120	\$10.4	\$8.0
DPL	1,957	917	\$15.4	\$5.1
Dominion	1	0	\$0.0	\$0.0
JCPL	1,332	715	\$10.1	\$2.8
Met-Ed	1,273	515	\$20.9	\$3.6
PECO	1,994	784	\$21.9	\$5.0
PENELEC	1,116	420	\$21.2	\$3.8
PPL	3,565	1,290	\$38.1	\$7.9
PSEG	2,325	1,201	\$31.2	\$8.4
Pepco	2,489	1,261	\$27.4	\$8.6
RECO	73	33	\$0.0	\$0.0
Total	41,770	22,543	\$758.9	\$226.9

\* Through 31-Dec-2012

<sup>42</sup> It is a requirement of Section 7.4.2 (i) in the OATT that any ARR request made in Stage 1A must be feasible and transmission capability must be raised if an ARR request is found to be infeasible.

<sup>43</sup> See PJM, "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 28.

## 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.<sup>44</sup> 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. 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 12-33 lists the incremental ARR allocation volume for the current and previous planning periods from the 2008 to 2009 planning period through the 2012 to 2013 planning periods. For the 2012 to 2013 planning period there were requests for 687.4 MW and all of the bids were cleared.

**Table 12-33 Incremental ARR allocation volume: Planning periods 2008 to 2009 through 2012 to 2013**

Planning Period	Bid and Requested		Cleared Volume (MW)	Uncleared		
	Count	Volume (MW)		Volume	Volume (MW)	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%
2012/2013	15	687.4	687.4	100%	0	0%

## 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.<sup>45</sup> 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.

Table 12-34 lists the three RTEP upgrade projects that were allocated a total of 678.2 MW of IARRs.

**Table 12-34 IARRs allocated for 2012 to 2013 Annual ARR Allocation for RTEP upgrades<sup>46</sup>**

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

## 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.

Effective August 1, 2012, as ordered by FERC in Docket No. EL12-50-000, in addition to new transmission, residual ARRs are now available for eligible participants

<sup>45</sup> 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/ftr/annual-arr-allocation/2011-2012/iarrs-rtep-upgrades-allocated-for-2011-12-planning-period.aspx>>.

<sup>46</sup> 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, PEACBOT 22 KV UNIT02 and PEACBOT 22 KV UNIT03.

<sup>44</sup> PJM. "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 30.

when a transmission outage was modeled in the Annual ARR Allocation, but the transmission facility becomes available during the modeled year. These residual ARRs are determined the month before the effective date, are only available on paths prorated in Stage 1 of the Annual ARR Allocation and are allocated automatically to participants. Residual ARRs are effective for single, whole months and cannot be self scheduled. ARR target allocations are based on the clearing prices from FTR obligations in the effective monthly auction, may not exceed zonal Network Services Peak Load or Firm Transmission Reservation Levels and are only available up to the prorated ARR MW capacity as allocated in the Annual ARR Allocation.

Table 12-35 shows the Residual ARRs automatically allocated to eligible participants, along with the target allocations from the effective month.

**Table 12-35 Residual ARR allocation volume and target allocation**

Month	Bid and Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Target Allocation
Aug-12	4,508.2	2,460.5	54.6%	\$1,026,836
Sep-12	4,696.3	2,343.1	49.9%	\$1,003,031
Oct-12	6,502.2	1,698.9	26.1%	\$584,810
Nov-12	3,677.8	1,530.6	41.6%	\$393,221
Dec-12	7,006.6	1,614.5	23.0%	\$463,325

## Market Performance

### Volume

**Table 12-36 Annual ARR allocation volume: Planning periods 2011 to 2012 and 2012 to 2013**

Planning Period	Stage	Round	Requested Count	Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
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
	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%
2012/2013	1A	0	16,069	67,302	67,300	100.0%	2	0.0%
	1B	1	11,487	30,013	18,432	61.4%	11,581	38.6%
		2	2	4,887	22,597	2,701	12.0%	19,896
	3	3	3,682	22,496	3,334	14.8%	19,162	85.2%
		4	3,023	22,362	6,219	27.8%	16,143	72.2%
		Total		11,592	67,455	12,254	18.2%	55,201
	Total		39,148	164,770	97,986	59.5%	66,784	40.5%

Table 12-36 shows the volume of ARR allocations for each round for the 2011 to 2012 and 2012 to 2013 planning periods. For the 2012 to 2013 planning period there were 67,302 MW (40.8 percent of total demand) requested in

Stage 1A, 30,013 MW (18.2 percent of total demand) requested in Stage 1B and 67,455 MW (40.9 percent of total demand) requested in Stage 2. Of 164,770 MW in total requests, 67,300 MW were allocated in Stage 1A, with 2.7 MW relinquished, 18,432 MW were allocated in Stage 1B and 12,254 MW were allocated in Stage 2 for a total of 98,986 MW (59.5 percent) allocated. Eligible market participants subsequently self scheduled 41,716 MW (42.1 percent) of these ARRs as FTRs, leaving 57,270 MW of ARRs outstanding. For the 2011 to 2012 planning period there were 64,160 MW (43.2 percent of total demand) requested in Stage 1A, 22,208 MW (18.4 percent of demand) requested in Stage 1B and 57,053 MW (38.4 MW of total demand) requested in Stage 2. Of 148,538 MW in total ARR requests, 64,160 MW were allocated in Stage 1A, 22,208 were allocated in Stage 1B and 16,108 were allocated in Stage 2 for a total of 102,476 MW (69.0 percent). ARR holders did not relinquish any ARRs for the 2011 to 2012 planning period.

### Stage 1A Infeasibility

Stage 1A ARRs are allocated for a 10 year period, with the ability for a participant to opt out of any planning period. PJM conducts a simultaneous feasibility analysis to determine transmission upgrades so that the long term ARRs can remain feasible. If a simultaneous feasibility test violation occurs in any year of this test PJM will identify or accelerate any transmission upgrades to resolve the violation and these upgrades will be included in the PJM RTEP process.

For the 2012 to 2013 planning period, Stage 1A of the Annual ARR Allocation was infeasible. According to Section 7.4.2 (i) of the PJM OATT the capability limits of the binding constraints rendering these ARRs infeasible must be increased in the model and that these increased limits must then be used in subsequent ARR and FTR allocations and auctions

for the entire planning period, except in the case of extraordinary circumstances. These infeasibilities are due to newly monitored facilities where upgrades could not be planned in advance, facilities not owned by PJM and an overall reduced system capability.

The consequence of this increased capability in the models which does not reflect actual capability is an over allocation of both ARRs and FTRs for the entire planning period. In the case of ARRs this over allocation will lower the ARR funding level by selling more capability on the same transmission network. In the case of FTRs the over allocation will exacerbate the underfunding problem by selling more FTRs than are physically feasible with no increase in congestion collected.

Table 12-37 lists the constraints for which ARR requests were found to be infeasible for the 2012 to 2013 ARR Stage 1A Allocation and the MW increase in modeled facility ratings required to make them feasible.

**Table 12-37 Constraints with capacity increases due to Stage 1A infeasibility for the 2012 to 2013 ARR Allocation**

Constraint	Type	Control Zone	MW Increase
Pleasant Prairie - Zion	Flowgate	MISO	311
Breed - Wheatland	Flowgate	MISO	221
Silver Lake	Transformer	ComEd	131
Oak Grove - Galesburg	Flowgate	MISO	96
Kenosha - Lakeview	Flowgate	MISO	73
Belvidere - Woodstock	Line	ComEd	23
Harwood - Susquehanna	Line	PPL	16
Belmont	Transformer	AP	14
Nucor - Whitestown	Flowgate	MISO	7

## 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 total 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 total 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 received \$620.2 million in credits from the Annual FTR Auction during the 2012 to 2013 planning period, with an average hourly ARR credit of \$0.63 per MW. During the comparable 2011 to 2012 planning period, ARR holders received \$1,055.9 million in ARR credits, with an average hourly ARR credit of \$1.05 per MW.

Table 12-38 lists ARR target allocations and net revenue sources from the Annual and Monthly Balance of Planning Period FTR Auctions for the 2011 to 2012 and the 2012 to 2013 (through December 31, 2012) planning periods.

**Table 12-38 ARR revenue adequacy (Dollars (Millions)): Planning periods 2011 to 2012 and 2012 to 2013**

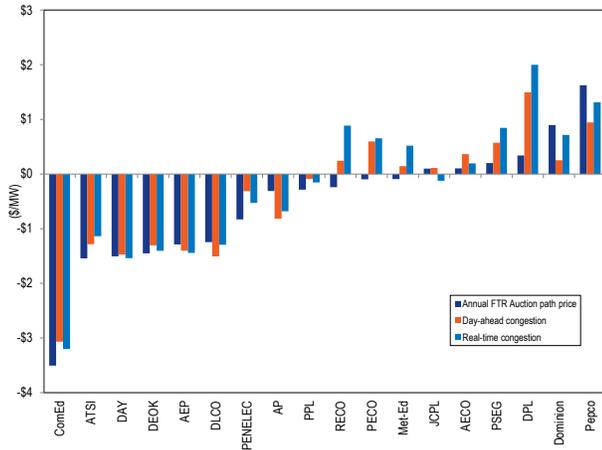
	2011/2012	2012/2013
Total FTR auction net revenue	\$1,055.9	\$620.2
Annual FTR Auction net revenue	\$1,029.6	\$602.9
Monthly Balance of Planning Period FTR Auction net revenue*	\$26.3	\$17.3
ARR target allocations	\$947.3	\$565.4
ARR credits	\$947.3	\$565.4
Surplus auction revenue	\$108.6	\$54.7
ARR payout ratio	100%	100%
FTR payout ratio*	80.6%	74.8%

\* Shows twelve months for 2011/2012 seven months for 2012/2013.

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

As an illustration of the relationship between FTRs and congestion, Figure 12-18 shows Annual FTR Auction prices and an approximate measure of day-ahead and real-time congestion for each PJM control zone for the 2012 to 2013 planning period. The day-ahead and real-time congestion are based on the difference between zonal congestion prices and Western Hub congestion prices.

**Figure 12-18 Annual FTR Auction prices vs. average day-ahead and real-time congestion for all control zones relative to the Western Hub<sup>47</sup>: Planning period 2011 to 2012**



### Effectiveness of ARR 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. During the first seven months of the 2012 to 2013 planning period, the total revenues received by the holders of all ARRs and FTRs offset 82.1 percent of the total congestion costs within PJM.

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 12-39. ARRs and self-scheduled FTRs that sink at an aggregate are assigned to a control zone if applicable.<sup>48</sup> 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 74.8 percent of the target allocation for the first seven months of the 2012 to 2013 planning period. The target allocation is not a guarantee of payment nor does it reflect congestion incurred on a particular FTR path. The target allocation is used to set a cap on path specific FTR payouts.

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 revenue and the congestion for each ARR control zone sink.

<sup>47</sup> DEOK was integrated into PJM on January 1, 2012 so was not available in the 2011 to 2012 Annual FTR Auction and therefore is not included in Figure 12-19.

<sup>48</sup> For Table 12-37 through Table 12-39, 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.

**Table 12-39 ARR and self-scheduled FTR congestion offset (in millions) by control zone: Planning period 2012 to 2013<sup>49</sup>**

Control Zone	ARR Credits	Self-Scheduled FTR Credits	Total Revenue	Total Revenue - Congestion	Congestion Difference	Percent Offset
AECO	\$5.9	\$0.0	\$5.9	\$6.3	(\$0.3)	94.4%
AEP	\$25.1	\$31.1	\$56.2	\$36.8	\$29.9	>100%
APS	\$40.3	\$12.1	\$52.5	\$5.7	\$50.9	>100%
ATSI	\$4.1	\$0.1	\$4.2	(\$1.3)	\$5.6	>100%
BGE	\$30.2	\$0.4	\$30.6	\$4.1	\$26.6	>100%
ComEd	\$101.8	\$0.0	\$101.8	(\$38.1)	\$140.0	>100%
DAY	\$1.5	\$1.2	\$2.7	(\$1.2)	\$4.3	>100%
DEOK	\$1.1	\$0.0	\$1.1	\$4.0	(\$2.8)	28.4%
DLCO	\$5.9	\$0.3	\$6.2	(\$0.2)	\$6.5	>100%
Dominion	\$4.8	\$33.3	\$38.1	\$11.9	\$37.4	>100%
DPL	\$11.5	\$1.3	\$12.8	\$27.0	(\$13.7)	47.5%
External	\$5.7	\$0.2	\$5.9	\$2.7	\$3.3	>100%
JCPL	\$9.0	(\$0.0)	\$9.0	\$7.8	\$1.1	>100%
Met-Ed	\$8.7	\$0.1	\$8.8	\$4.2	\$4.7	>100%
PECO	\$16.9	\$2.3	\$19.3	\$3.0	\$17.0	>100%
PENELEC	\$6.9	\$3.1	\$10.0	\$8.1	\$2.9	>100%
Pepco	\$24.8	\$0.7	\$25.5	\$22.7	\$3.1	>100%
PPL	\$17.6	\$0.8	\$18.4	\$5.6	\$13.1	>100%
PSEG	\$26.1	\$2.8	\$28.9	\$2.1	\$27.7	>100%
RECO	\$0.0	\$0.0	\$0.0	\$0.8	(\$0.8)	0.2%
Total	\$347.9	\$90.1	\$438.0	\$111.9	\$370.5	>100%

### Effectiveness of ARRs and FTRs as an Offset to Congestion

Table 12-40 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 2012 to 2013 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

74.8 percent of the target allocation for the 2012 to 2013 planning period. The “FTR Auction Revenue” column shows the amount paid for FTRs that sink in each control 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 offset 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.<sup>50</sup> The last column shows the difference between the total ARR and FTR offset and the congestion cost for each control zone.

<sup>49</sup> 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.

<sup>50</sup> The total zonal congestion numbers were calculated as of March 8, 2013 and may change as a result of continued PJM billing updates.

**Table 12-40 ARR and FTR congestion offset (in millions)  
by control zone: Planning period 2012 to 2013**

Control Zone	ARR Credits	FTR Credits	FTR Auction Revenue	Total ARR and FTR Offset	Congestion	Total Offset - Congestion Difference	Percent Offset
AECO	\$5.9	\$0.4	\$5.8	\$0.6	\$5.9	(\$5.3)	10.3%
AEP	\$107.1	\$56.6	\$121.7	\$42.0	\$66.7	(\$24.7)	63.0%
APS	\$76.2	\$13.6	\$40.3	\$49.5	\$36.3	\$13.2	>100%
ATSI	\$4.3	\$10.0	(\$0.7)	\$15.0	\$2.4	\$12.6	>100%
BGE	\$31.5	\$14.6	\$42.3	\$3.9	\$16.0	(\$12.1)	24.4%
ComEd	\$121.4	\$68.1	\$82.7	\$106.8	\$107.0	(\$0.2)	99.8%
DAY	\$3.8	\$3.6	\$5.3	\$2.1	\$4.9	(\$2.8)	42.5%
DEOK	\$1.4	\$5.7	\$3.9	\$3.1	\$2.6	\$0.5	>100%
DLCO	\$7.2	\$0.4	\$7.7	(\$0.1)	\$1.4	(\$1.5)	0.0%
Dominion	\$79.3	\$49.3	\$110.1	\$18.5	\$43.1	(\$24.7)	42.8%
DPL	\$12.3	\$24.0	\$19.3	\$17.0	\$16.6	\$0.4	>100%
External	\$7.5	(\$1.6)	\$1.7	\$4.2	(\$30.4)	\$34.6	>100%
JCPL	\$9.3	\$3.3	\$20.1	(\$7.5)	\$9.2	(\$16.7)	0.0%
Met-Ed	\$9.0	\$6.2	\$15.9	(\$0.6)	\$0.2	(\$0.8)	0.0%
PECO	\$20.1	\$17.8	\$18.1	\$19.8	(\$1.2)	\$21.0	>100%
PENELEC	\$11.8	\$18.2	\$30.8	(\$0.8)	\$19.1	(\$19.9)	0.0%
Pepeco	\$27.1	\$18.9	\$81.0	(\$35.0)	\$16.5	(\$51.5)	0.0%
PPL	\$20.2	\$4.4	\$10.3	\$14.3	\$8.0	\$6.3	>100%
PSEG	\$24.0	\$19.1	\$33.0	\$10.0	(\$3.2)	\$13.2	>100%
RECO	\$0.0	(\$0.1)	(\$1.8)	\$1.7	\$0.9	\$0.8	>100%
Total	\$579.6	\$332.6	\$647.6	\$264.6	\$322.1	(\$57.5)	82.1%

Table 12-41 shows the total offset due to ARRs and FTRs for the entire 2011 to 2012 planning period and the first seven months of the 2012 to 2013 planning period.

**Table 12-41 ARR and FTR congestion hedging (in millions): Planning periods 2011 to 2012 and 2012 to 2013 through December 31, 2012<sup>51</sup>**

Planning Period	ARR Credits	FTR Credits	FTR Auction Revenue	Total ARR and FTR Offset	Congestion	Total Offset - Congestion Difference	Percent Offset
2011/2012	\$982.9	\$794.3	\$1,092.4	\$684.8	\$771.2	(\$86.4)	88.8%
2012/2013*	\$579.6	\$332.6	\$647.6	\$264.6	\$322.1	(\$57.5)	82.1%

\* Shows seven months ended 31-Dec-12

<sup>51</sup> The FTR credits do not include after-the-fact adjustments. For the 2012 to 2013 planning period, the ARR credits were the total credits allocated to all ARR of this planning period, and the FTR Auction Revenue includes the net revenue in the Monthly Balance of Planning Period FTR Auctions for the planning period and the portion of Annual FTR Auction revenue distributed to the entire planning period.