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.[1] Financial transmission rights and the associated revenues were directly provided to loads in recognition of the fact that loads pay for the transmission system which permits low cost generation to be delivered to load and which creates the funds available to offset congestion costs in an LMP market.[2,3]

The *2013 Quarterly State of the Market Report for PJM: January through March,* focuses on the Monthly Balance of Planning Period FTR Auctions during the 2012 to 2013 planning period, which covers June 1, 2012, through March 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	Mixed

1 *See* 81 FERC ¶ 61,257, at 62,241 (1997).
2 *See Id.* at 62, 259–62,260 & n. 123.
3 For a more complete explanation, see the *2012 State of the Market Report for PJM*, Volume II, Section 12, "FTRs."

- 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 mixed because while there are many positive features of the FTR design including a wide range of options for market participants to acquire FTRs and a competitive auction mechanism, there are several features of the FTR design which result in underfunding and features of the FTR design which incorporate subsidies which also contribute to underfunding.

Overview

Financial Transmission Rights

Market Structure

- **Supply.** Market participants can also sell FTRs. In the Monthly Balance of Planning Period FTR Auctions for the first ten months (June 2012 through March 2013) of the 2012 to 2013 planning period, total participant FTR sell offers were 4,627,336 MW, down from 5,330,537 MW for the same period during the 2011 to 2012 planning period.
- **Demand.** The total FTR buy bids from the Monthly Balance of Planning Period FTR Auctions for the first ten months of the 2012 to 2013 (June 2012 through March 2013) planning period increased 11.8 percent from 16,367,977 MW for the same time period of the prior planning period, to 18,299,865 MW.
- **Patterns of Ownership.** For the Monthly Balance of Planning Period Auctions, financial entities purchased 83.0 percent of prevailing flow and 87.9 percent of counter flow FTRs for 2013. Financial entities owned 65.0 percent of all prevailing and counter flow FTRs, including 56.3 percent of

all prevailing flow FTRs and 81.5 percent of all counter flow FTRs during the same time period.

Market Behavior

- **FTR Forfeitures.** Total forfeitures for the first nine months of the 2012 to 2013 planning period were $492,556 (0.06 percent of total FTR target allocations).
- **Credit Issues.** Four participants defaulted during 2013 from eight default events. The average of these defaults was $68,812 with four based on inadequate collateral and four based on nonpayment. The average collateral default was $13,275 and the average nonpayment default was $124,349. The majority of these defaults were promptly cured. These defaults were not necessarily related to FTR positions.

Market Performance

- **Volume.** For the first ten months of the 2012 to 2013 planning period, the Monthly Balance of Planning Period FTR Auctions cleared 1,976,401 MW (10.8 percent) of FTR buy bids and 651,226 MW (14.1 percent) of FTR sell offers.
- **Price.** The weighted-average buy-bid FTR price in the Monthly Balance of Planning Period FTR Auctions for the first ten months of the 2012 to 2013 planning period was $0.12, up from $0.10 per MW in the first ten months of the 2011 to 2012 planning period.
- **Revenue.** The Monthly Balance of Planning Period FTR Auctions generated $21.7 million in net revenue for all FTRs for the first ten months of the 2012 to 2013 planning period, down from $24.8 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.[4] FTRs were paid at 69.5 percent of the target allocation level for the first ten months of the 2012 to 2013 planning period. Congestion revenues are allocated to FTR holders based on FTR target allocations. PJM collected $533.2 million of FTR revenues during the first ten months of the 2012 to 2013 planning period and $799.4 million during the 2011 to 2012 planning period. For the first ten months of the 2012 to 2013 planning period, the top sink and top source with the highest positive FTR target allocations were PSEG and Western Hub. Similarly, the top sink and top source with the largest negative FTR target allocations were both Western 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 $67.4 million in profits for physical entities, of which $63.6 million was from self-scheduled FTRs, and $45.1 million for financial entities. As shown in Table 12-9, not every FTR was profitable. For example, prevailing flow FTRs purchased by physical entities, but not self-scheduled, were not profitable in March 2013.

Auction Revenue Rights

Market Structure

- **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 14,211.2 MW of residual ARRs with a total target allocation of $4,475,521.
- **ARR Reassignment for Retail Load Switching.** There were 48,077 MW of ARRs associated with approximately $464,100 of revenue that were reassigned in the first ten months of the 2012 to 2013 planning period. There were 41,770 MW of ARRs associated with approximately $758,900

4 Unless specifically noted, payout ratios reported in this section are calculated using PJM's method and are consistent with PJM's reported payout ratios.

of revenue that were reassigned for the full twelve months of the 2011 to 2012 planning period.

Market Performance

- **Revenue Adequacy.** For the first ten months of the 2012 to 2013 planning period, the ARR target allocations were $565.4 million while PJM collected $624.6 million from the combined Long Term, Annual and Monthly Balance of Planning Period FTR Auctions through March 31, 2013, 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.
- **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 89.8 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 has received a lot of attention in the PJM FTR market. 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 the 2012 to 2013 planning period, the reported payout ratio is 69.5 percent while the correctly calculated payout ratio is 72.2 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 the first ten months of the 2012 to 2013 planning period would have been 85.2 percent instead of the reported 69.5 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 the first ten months of the 2012 to 2013 planning period from the reported 69.5 percent to 89.1 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.[5] The value of an FTR reflects the difference in congestion prices rather than the difference in LMPs, which includes both congestion and marginal losses. Auction market participants are free to request FTRs between any pricing nodes on the system, including hubs, control zones, aggregates, generator buses, load buses and interface pricing points. FTRs are available to the nearest 0.1 MW. The FTR target allocation is calculated hourly and is equal to the product of the FTR MW and the congestion price difference between sink and source that occurs in the Day-Ahead Energy Market. The value of an FTR can be positive or negative depending on the sink minus source congestion price difference, with a negative difference resulting in a liability for the holder. The FTR target allocation is a cap on what FTR holders can receive. Revenues above that level 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

5 For additional information on marginal losses, see the *2012 State of the Market Report for PJM*, Volume II, Section 10, "Congestion and Marginal Losses," at "Marginal Losses."

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.[6] FTRs can also be traded between market participants through bilateral 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

6 See PJM. "Manual 6: Financial Transmission Rights," Revision 13 (June 28, 2012), p. 38.

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.[7] 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.

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.[8]

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

The total FTR buy bids from the Monthly Balance of Planning Period FTR Auctions for the first ten months of the 2012 to 2013 planning period decreased 3.5 percent to 1,976,401 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.

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 12-2 presents the Monthly Balance of Planning Period FTR Auction cleared FTRs for January through March 2013 by trade type, organization type and FTR direction. Financial entities purchased 83.0 percent of prevailing flow and 87.9 percent of counter flow FTRs for the first ten months of the 2012 to 2013 planning period, with the result that financial entities purchased

7 See PJM. "Manual 6: Financial Transmission Rights," Revision 13 (June 28, 2012), p. 54.
8 See PJM. "Manual 6: Financial Transmission Rights," Revision 13 (June 28, 2012), p. 39.

65.0 percent of all prevailing and counter flow FTR buy bids in the Monthly Balance of Planning Period FTR Auction cleared FTRs for January through March 2013.

Table 12-2 Monthly Balance of Planning Period FTR Auction patterns of ownership by FTR direction: January through March 2013

		FTR Direction		
Trade Type	Organization Type	Prevailing Flow	Counter Flow	All
Buy Bids	Physical	17.0%	12.1%	15.1%
	Financial	83.0%	87.9%	84.9%
	Total	100.0%	100.0%	100.0%
Sell Offers	Physical	18.8%	19.5%	19.0%
	Financial	81.2%	80.5%	81.0%
	Total	100.0%	100.0%	100.0%

Table 12-3 presents the daily FTR net position ownership for January through March 2013, by FTR direction.

Table 12-3 Daily FTR net position ownership by FTR direction: January through March 2013

	FTR Direction		
Organization Type	Prevailing Flow	Counter Flow	All
Physical	43.7%	18.5%	35.0%
Financial	56.3%	81.5%	65.0%
Total	100.0%	100.0%	100.0%

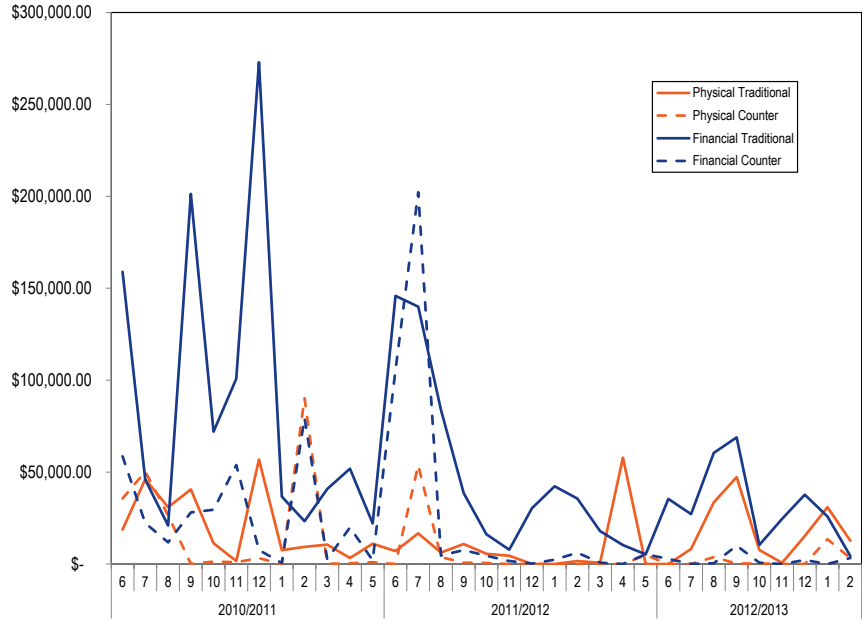
Market Behavior

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 12-1 shows the FTR forfeitures values for both counter flow and prevailing flow FTRs for each month of June 2010 through February 2013 by company type.[9] Total forfeitures for the first ten months of the 2012 to 2013 planning period were $492,556 (0.06 percent of total FTR target allocations).

Figure 12-1 Monthly FTR Forfeitures for physical and financial participants: June 2010 through February 2013



9 March forfeitures are not billed to customers until after the issuance of this report.

Credit Issues

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

Four participants defaulted during 2013 from eight default events. The average of these defaults was $68,812 with four based on inadequate collateral and four based on nonpayment. The average collateral default was $13,275 and the average nonpayment default was $124,349. The majority of these defaults were promptly cured.

Market Performance

Volume

Table 12-4 provides the Monthly Balance of Planning Period FTR Auction market volume for the entire 2011 to 2012 planning period and the first ten months of the 2012 to 2013 planning period. There were 11,652,143 MW of FTR buy bid obligations and 3,621,897 MW of FTR sell offer obligations for all bidding periods in the 2012 to 2013 planning period through March 31, 2013. The monthly balance of planning period auctions cleared 1,908,482 MW (16.4 percent) of FTR buy bid obligations and 415,307 MW (11.5 percent) of FTR sell off obligations.

There were 6,647,722 MW of FTR buy bid options and 1,005,439 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 March 31, 2013. The monthly auctions cleared 67,918 MW (1.0 percent) of FTR buy bid options, and 235,919 MW (23.5 percent) of FTR sell offers.

Table 12-4 Monthly Balance of Planning Period FTR Auction market volume: January through March 2013

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-13	Obligations	Buy bids	150,397	963,036	166,622	17.3%	796,414	82.7%
		Sell offers	84,563	297,609	34,710	11.7%	262,899	88.3%
	Options	Buy bids	2,830	104,318	6,767	6.5%	97,551	93.5%
		Sell offers	10,204	73,624	17,322	23.5%	56,302	76.5%
Feb-13	Obligations	Buy bids	164,620	1,035,756	166,386	16.1%	869,369	83.9%
		Sell offers	76,210	261,631	36,402	13.9%	225,229	86.1%
	Options	Buy bids	2,518	94,039	4,749	5.0%	89,290	95.0%
		Sell offers	9,053	62,833	16,434	26.2%	46,399	73.8%
Mar-13	Obligations	Buy bids	168,718	1,092,986	188,849	17.3%	904,138	82.7%
		Sell offers	77,248	256,820	40,079	15.6%	216,741	84.4%
	Options	Buy bids	2,674	103,046	5,591	5.4%	97,455	94.6%
		Sell offers	10,054	84,993	21,581	25.4%	63,411	74.6%
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	2,024,470	11,652,143	1,908,482	16.4%	9,743,660	83.6%
		Sell offers	1,000,008	3,621,897	415,307	11.5%	3,206,590	88.5%
	Options	Buy bids	101,282	6,647,722	67,918	1.0%	6,579,804	99.0%
		Sell offers	140,623	1,005,439	235,919	23.5%	769,519	76.5%

* Shows Twelve Months for 2011/2012; ** Shows ten months ended 31-Mar-13 for 2012/2013

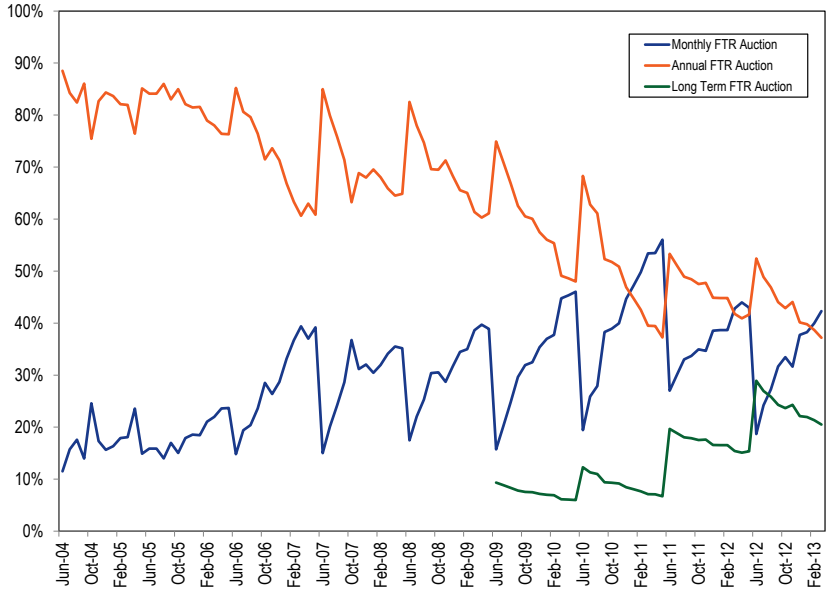
Table 12-5 presents the buy-bid, bid and cleared volume of the Monthly Balance of Planning Period FTR Auction, and the effective periods for the volume.

Table 12-5 Monthly Balance of Planning Period FTR Auction buy-bid, bid and cleared volume (MW per period): January through March 2013

Monthly Auction	MW Type	Prompt Month	Second Month	Third Month	Q1	Q2	Q3	Q4	Total
Jan-13	Bid	595,260	191,417	115,207				165,471	1,067,354
	Cleared	125,075	24,018	8,251				16,045	173,389
Feb-13	Bid	654,446	174,360	177,548				123,440	1,129,794
	Cleared	131,562	15,659	13,975				9,939	171,135
Mar-13	Bid	645,247	232,876	224,105				93,804	1,196,032
	Cleared	136,007	27,219	24,669				6,544	194,440

Figure 12-2 shows cleared auction volumes as a percent of the total FTR cleared volume by calendar months for June 2004 through March 2013, by type of auction.[10] 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 12-2 Cleared auction volume (MW) as a percent of total FTR cleared volume by calendar month: June 2004 through March 2013



10 Figure 12-2 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 12-6 provides the secondary bilateral FTR market volume for the entire 2011 to 2012 planning period and the ten months of the 2012 to 2013 planning period.

Table 12-6 Secondary bilateral FTR market volume: Planning periods 2011 to 2012 and 2012 to 2013[11]

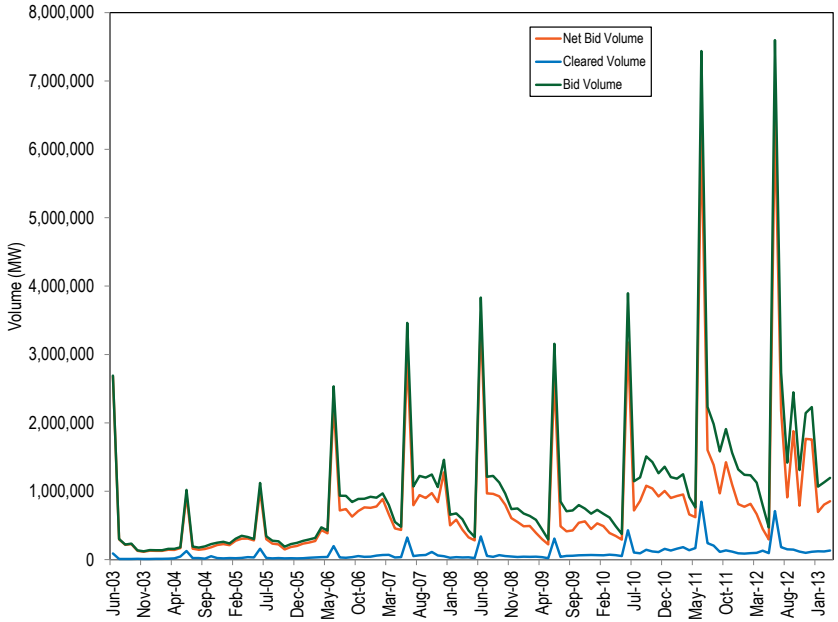
Planning Period	Hedge Type	Class Type	Volume (MW)
2011/2012	Obligation	24-Hour	239
		On Peak	11,925
		Off Peak	4,268
		Total	16,431
	Option	24-Hour	0
		On Peak	8,965
		Off Peak	6,330
		Total	15,296
2012/2013*	Obligation	24-Hour	90
		On Peak	127
		Off Peak	40
		Total	257
	Option	24-Hour	0
		On Peak	0
		Off Peak	0
		Total	0

* Shows ten months ended 31-Mar-2013

Figure 12-3 shows the FTR bid, cleared and net bid volume from June 2003 through March 2013 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.

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

Figure 12-3 Long Term, Annual and Monthly FTR Auction bid and cleared volume: June 2003 through March 2013



Price

Table 12-7 shows the weighted-average cleared buy-bid price in the Monthly Balance of Planning Period FTR Auctions by bidding period for January 2013 through March 2013. For example, for the January 2013 Monthly Balance of Planning Period FTR Auction, the current month column is January, the second month column is February and the third month column is March. Quarters 1 through 4 are represented in the Q1, Q2, Q3 and Q4 columns. The total column represents all of the activity within the January 2013 Monthly Balance of Planning Period FTR Auction.

The cleared weighted-average price paid in the Monthly Balance of Planning Period FTR Auctions during the first ten 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.

Table 12-7 Monthly Balance of Planning Period FTR Auction cleared, weighted-average, buy-bid price per period (Dollars per MW): January through March 2013

Monthly Auction	Prompt Month	Second Month	Third Month	Q1	Q2	Q3	Q4	Total
Jan-13	$0.11	$0.19	$0.05				$0.09	$0.11
Feb-13	$0.08	$0.12	$0.10				$0.13	$0.09
Mar-13	$0.10	$0.12	$0.10				$0.05	$0.10

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 12-8 lists FTR profits by organization type and FTR direction for the period from January through March, 2013. 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 $67.4 million in profits for physical entities, of which $63.6 million was from self-scheduled FTRs, and $45.1 million for financial entities.

Table 12-8 FTR profits by organization type and FTR direction: January through March 2013

	FTR Direction				
Organization Type	Prevailing Flow	Self Scheduled Prevailing Flow	Counter Flow	Self Scheduled Counter Flow	All
Physical	($4,671,333)	$62,599,515	$8,446,774	$1,033,054	$67,408,009
Financial	$17,887,161	NA	$27,202,962	NA	$45,090,122
Total	$13,215,828	$62,599,515	$35,649,736	$1,033,054	$112,498,132

Table 12-9 lists the monthly FTR profits in 2013 by organization type.

Table 12-9 Monthly FTR profits by organization type: January through March 2013

	Organization Type			
Month	Physical	Self Scheduled FTRs	Financial	Total
Jan	$1,219,347.95	$26,828,073.08	$18,582,903.58	$46,630,324.60
Feb	$12,412,193.25	$21,240,230.26	$20,507,943.83	$54,160,367.33
Mar	($9,856,100.25)	$15,564,264.86	$5,999,274.99	$11,707,439.60
Total	$3,775,440.94	$63,632,568.20	$45,090,122.40	$112,498,131.54

Revenue

Monthly Balance of Planning Period FTR Auction Revenue

Table 12-10 shows Monthly Balance of Planning Period FTR Auction revenue data by trade type, type and class type for January through March 2013. The Monthly Balance of Planning Period FTR Auction netted $21.7 million in revenue, with buyers paying $117.6 million and sellers receiving $95.9 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.

Table 12-10 Monthly Balance of Planning Period FTR Auction revenue: January through March 2013

Monthly Auction	Type	Trade Type	Class Type 24-Hour	On Peak	Off Peak	All
Jan-13	Obligations	Buy bids	$42,552	$4,558,023	$3,371,362	$7,971,937
		Sell offers	$106,975	$2,609,123	$1,599,772	$4,315,870
	Options	Buy bids	$0	$237,321	$153,334	$390,655
		Sell offers	$0	$1,133,641	$1,206,317	$2,339,958
Feb-13	Obligations	Buy bids	$176,565	$3,587,647	$2,468,155	$6,232,366
		Sell offers	$401,600	$1,782,016	$1,097,066	$3,280,682
	Options	Buy bids	$5,100	$99,651	$128,731	$233,482
		Sell offers	$0	$861,109	$904,603	$1,765,712
Mar-13	Obligations	Buy bids	$189,939	$4,040,854	$3,035,268	$7,266,060
		Sell offers	$61,862	$2,221,264	$1,434,875	$3,718,001
	Options	Buy bids	$16,526	$229,272	$95,137	$340,935
		Sell offers	$0	$1,242,062	$1,381,010	$2,623,072
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	$72,326	$70,463,354	$40,182,381	$110,718,061
		Sell offers	$4,106,051	$37,289,815	$17,371,988	$58,767,854
	Options	Buy bids	$105,393	$4,129,127	$2,644,932	$6,879,452
		Sell offers	$313,319	$20,684,343	$16,138,588	$37,136,250
	Total		$7,287,487	$92,019,131	$56,390,560	$155,697,178

* Shows Twelve Months; ** Shows ten months ended 31-Mar-2013 for 2012/2013

Figure 12-4 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 sources accounted for $45.0 million of the total revenue of $21.7 million paid in the auction, they also comprised 5.9 percent of all FTRs bought in the auction. The top 10 negative revenue producing FTR sinks accounted for -$14.6 million of revenue and constituted 0.1 percent of all FTRs bought in the auction.

Figure 12-4 Ten largest positive and negative revenue producing FTR sinks purchased in the Monthly Balance of Planning Period FTR Auctions: first ten months of the 2012 to 2013 planning period

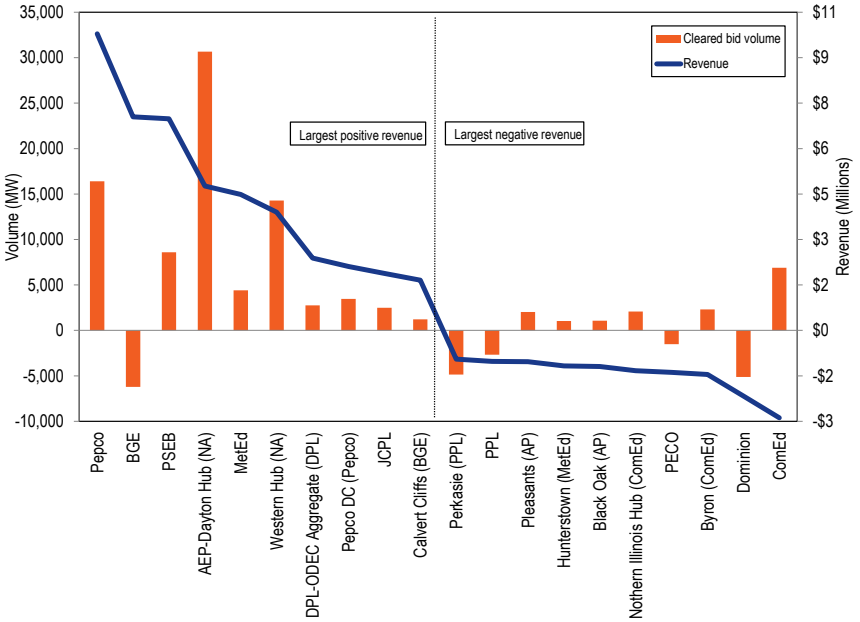
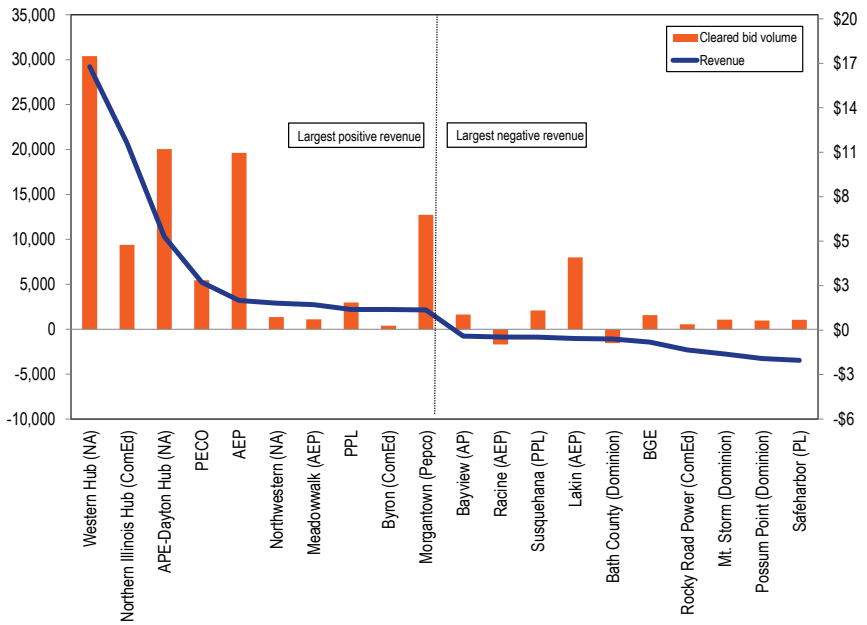


Figure 12-5 summarizes total revenue associated with all FTRs, regardless of sink, from the FTR sources that produced the largest positive and negative revenue from the Monthly Balance of Planning Period FTR Auctions during the 2012 to 2013 planning period. The top 10 positive revenue producing FTR sources accounted for $44.5 million of the total revenue of $21.7 million paid in the auction, they also comprised 7.8 percent of all FTRs bought in the auction. The top 10 negative revenue producing FTR sinks accounted for -$12.6 million of revenue and constituted 1.0 percent of all FTRs bought in the auction.

Figure 12-5 Ten largest positive and negative revenue producing FTR sources purchased in the Monthly Balance of Planning Period FTR Auctions: first ten months of the 2012 to 2013 planning period



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 March 31, 2013. Figure 12-6 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 23.5 percent of total positive target allocations during the first ten months of the 2012 to 2013 planning period with the PSEG zone accounting for 4.3 percent of all positive target allocations. The top 10 sinks that created liability accounted for 8.8 percent of total negative target allocations with the Western Hub accounting for 2.0 percent of all negative target allocations.

Figure 12-6 Ten largest positive and negative FTR target allocations summed by sink: first ten months of the 2012 to 2013 planning period

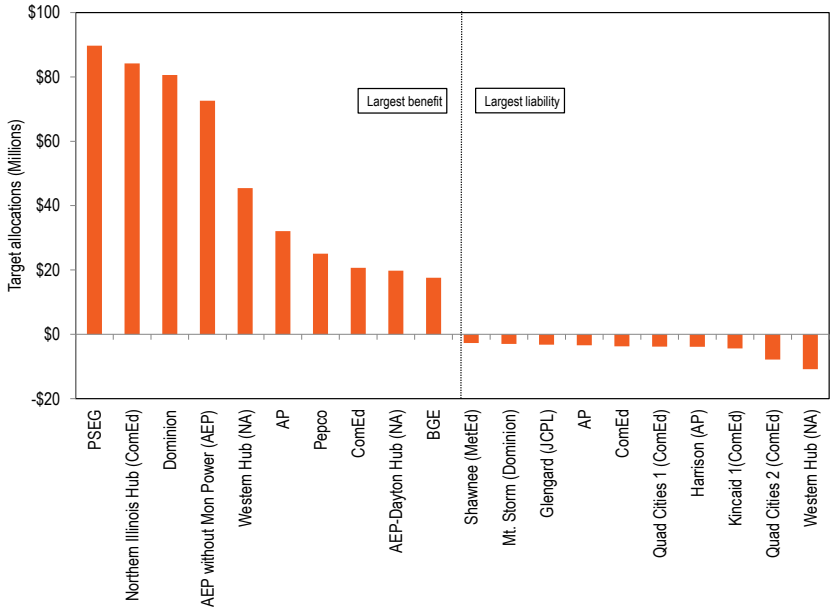
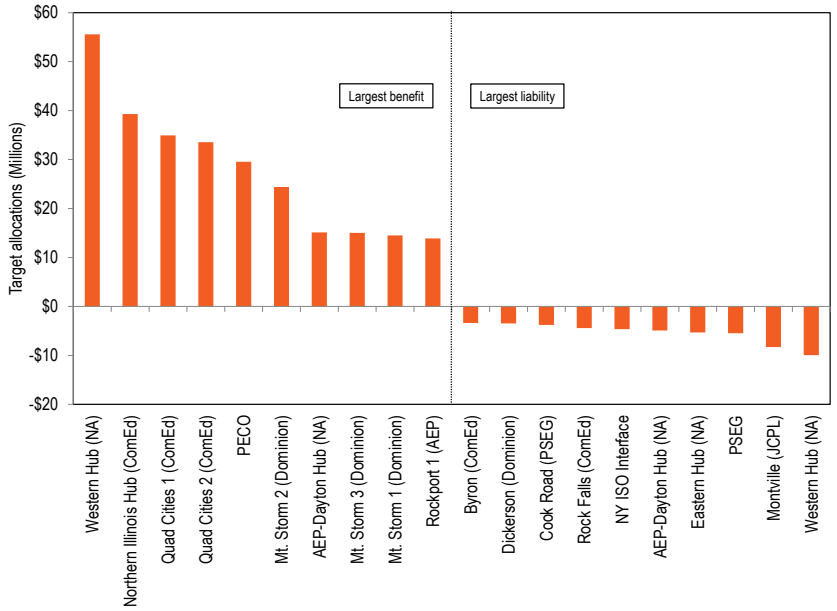


Figure 12-7 shows the ten largest positive and negative FTR target allocations, summed by source, for the 2012 to 2013 planning period. The top 10 sources with a positive target allocation accounted for 13.3 percent of total positive target allocations with the Western Hub accounting for 2.7 percent 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 Western Hub accounting for 1.9 percent.

Figure 12-7 Ten largest positive and negative FTR target allocations summed by source: first ten months of the 2012 to 2013 planning period



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.[12] 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.[13] 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

12 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."

13 Hourly congestion revenues may be negative.

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 12-11 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.[14] 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 $0.2 million in congestion charges to Con Edison in the 2011 to 2012 planning period.[15,16]

Congestion charges were made to the Day Ahead Operating Reserves in October 2012, January 2013, and March 2013, for $0.6 million, $5.0 million and $0.7 million. These charges are necessary if the hourly congestion revenues are negative at the end of the month. If this happens, charges are allocated retroactively 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 and three times in the 2012 to 2013 planning period.

FTRs were paid at 69.5 percent of the target allocation level for the first ten months of the 2012 to 2013 planning period. Congestion revenues are allocated to FTR holders based on FTR target allocations. PJM collected $528.7 million of FTR revenues during the first ten months of the 2012 to 2013 planning period, and $705.9 million during the first ten months of the 2011 to 2012 planning period, a 25.1 percent decrease. For the first ten months of the 2012 to 2013 planning period, the top sink and top source with the highest positive FTR target allocations were PSEG and the Western Hub. Similarly, the top sink and top source with the largest negative FTR target allocations were both the Western Hub.

Table 12-11 presents the PJM FTR revenue detail for the 2011 to 2012 planning period and the first ten months of the 2012 to 2013 planning period.

Table 12-11 Total annual PJM FTR revenue detail (Dollars (Millions)): Planning periods 2011 to 2012 and 2012 to 2013 through March 31, 2013

Accounting Element	2011/2012	2012/2013**
ARR information		
ARR target allocations	$982.9	$488.6
FTR auction revenue	$1,091.8	$542.8
ARR excess	$108.9	$54.3
FTR targets		
FTR target allocations	$992.8	$768.7
Adjustments:		
Adjustments to FTR target allocations	($1.1)	($0.6)
Total FTR targets	$991.7	$768.1
FTR revenues		
ARR excess	$108.9	$54.3
Competing uses	$0.1	$0.1
Congestion		
Net Negative Congestion (enter as negative)	($64.5)	($75.2)
Hourly congestion revenue	$835.5	$585.5
Midwest ISO M2M (credit to PJM minus credit to Midwest ISO)	($79.6)	($36.0)
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
Adjustments:		
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	$527.4
Excess revenues distributed to other months	$0.0	$0.0
Net Negative Congestion charged to DA Operating Reserves	$0.0	$5.3
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	$533.2
Total congestion credits on bill (includes CEPSW and end-of-year distribution)	$799.6	$533.2
Remaining deficiency	$192.3	$234.9

** Shows ten months ended 31-Mar-13

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

15 111 FERC ¶ 61,228 (2005).

16 See the *2012 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 E-2, "Con Edison and PSE&G wheel settlements data: 2012."

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 12-12 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 12-12 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 12-12 Monthly FTR accounting summary (Dollars (Millions)): Planning period 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-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	$59.7	87.2%	$52.0	87.3%	($7.7)
Dec-12	$36.3	$50.3	72.2%	$36.3	72.5%	($14.0)
Jan-13	$63.4	$120.4	53.4%	$68.0	56.5%	($52.4)
Feb-13	$77.2	$128.1	60.5%	$77.2	60.2%	($50.9)
Mar-13	$51.7	$70.7	73.2%	$52.4	74.2%	($18.3)
Summary for Planning Period 2012 to 2013						
Total	$527.4	$768.9		$533.3	69.4%	($235.5)

Figure 12-8 shows the original FTR payout ratio with adjustments by month, excluding excess revenue distribution, for January 2004 through March 2013. The months with payout ratios above 100 percent are overfunded and the months with payout ratios under 100 percent are underfunded. Figure 12-8 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 12-8 FTR payout ratio with adjustments by month, excluding and including excess revenue distribution: January 2004 through March 2013

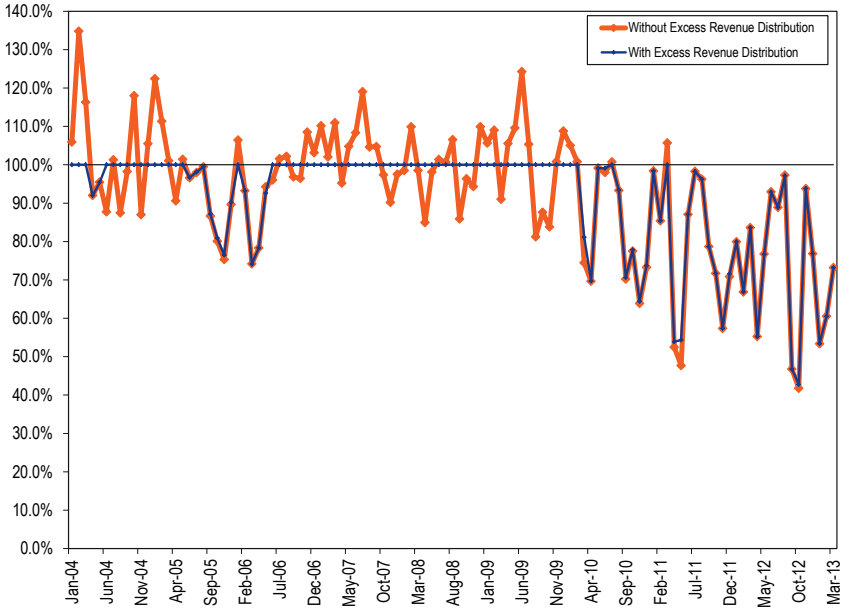


Table 12-13 shows the FTR payout ratio by planning period from the 2003 to 2004 planning period forward.

Table 12-13 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*	69.5%

*2012/2013 Through 31-Mar-13

Revenue Adequacy Issues and Solutions

Reported Payout Ratio

The payout ratios shown above in Table 12-13 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.[17] 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 12-14 shows the reported and actual payout ratio for the first ten months of the 2012 to 2013 planning period. In September the reported payout ratio is 8.8 percentage points below the actual payout ratio. For the planning period, the reported payout ratio is 2.8 percentage points below the actual payout ratio. For the first ten months of the 2012 to 2013 planning period, the reported payout ratio is 69.5 percent while the correctly calculated payout ratio is 72.3 percent.

Table 12-14 Reported and Actual Payout Ratios: June 2012 through March 2013

	Reported Payout Ratio	Actual Payout Ratio
Jun-12	93.0%	93.6%
Jul-12	89.0%	90.1%
Aug-12	97.5%	97.7%
Sep-12	47.0%	55.8%
Oct-12	42.7%	50.9%
Nov-12	87.3%	88.5%
Dec-12	72.3%	74.6%
Jan-13	56.8%	59.7%
Feb-13	60.2%	62.5%
Mar-13	74.2%	75.5%
Total	69.5%	72.3%

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.

17 See PJM. "Manual 28: Operating Agreement Accounting," Revision 56 (October 1, 2012), p. 50

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 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 12-15 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 12-15 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 12-16 shows the total value for the first ten months of the 2012 to 2013 planning period 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 so far for the 2012 to 2013 planning period would have been 85.2 percent instead of the reported 69.5 percent.

Table 12-16 Monthly positive and negative target allocations and payout ratios with and without hourly netting for the 2012 to 2013 planning period

	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)
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)	$24,821,559	42.6%	75.7%
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)	$36,289,881	72.2%	87.1%
Jan-13	$129,096,732	($8,682,957)	$233,783,161	($113,347,680)	$68,350,654	56.8%	77.7%
Feb-13	$135,713,011	($7,613,077)	$259,657,461	($131,557,526)	$77,154,565	60.2%	80.4%
Mar-13	$74,434,140	($3,760,700)	$146,552,085	($75,878,638)	$52,429,117	74.2%	87.6%
Total	$846,980,059	($78,302,518)	$1,598,272,637	($829,035,863)	$533,576,848	69.4%	85.3%

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 12-17 shows the monthly positive, negative and total target allocations.[18] Table 12-17 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 $61.7 million in revenue available to fund positive target allocations.

18 Reported payout ratio may differ between Table 12-16 and Table 12-17 due to rounding differences when netting target allocations and considering each FTR individually.

Table 12-17 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
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	$24,821,559	42.6%	$104,276,315	82.8%	$113,967,134
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	$36,289,881	71.9%	$96,138,591	90.5%	$99,836,132
Jan-13	$233,783,161	($113,347,680)	$120,435,482	$67,997,096	56.5%	$181,344,776	83.2%	$194,399,312
Feb-13	$259,657,461	($131,557,526)	$128,099,935	$77,154,565	60.2%	$208,712,090	85.4%	$221,784,584
Mar-13	$146,552,085	($75,878,638)	$70,673,447	$52,429,117	74.2%	$128,307,755	90.8%	$133,041,304
Total	$1,598,272,637	($829,035,863)	$769,236,775	$533,223,289	69.3%	$1,362,259,152	89.1%	$1,423,964,887

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

The result of removing portfolio netting and applying a payout ratio to counter flow FTRs would increase the calculated payout ratio for the first ten months of the 2012 to 2013 planning period from the reported 69.3 percent to 89.1 percent.

Figure 12-9 shows the FTR surplus, collected day-ahead, balancing and total congestion payments from January 2005 through March 2013.

Figure 12-9 FTR Surplus and the collected Day-Ahead, Balancing and Total congestion: January 2005 through March 2013

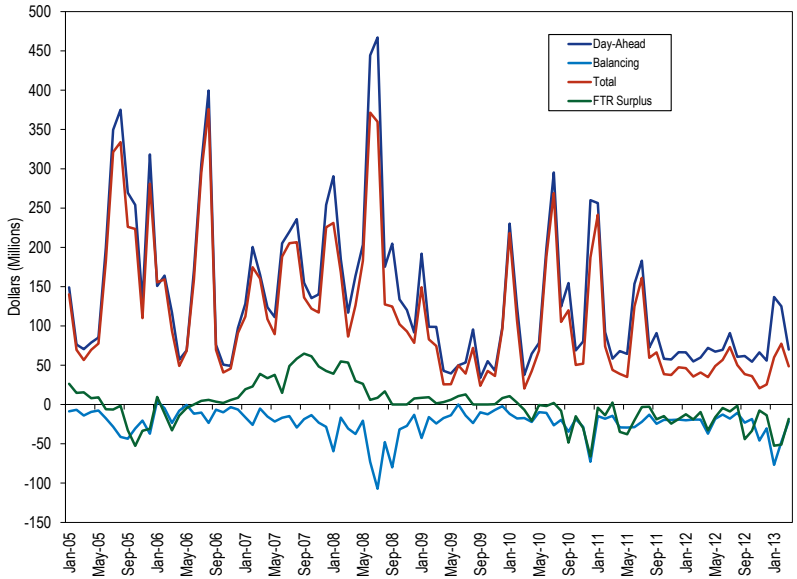
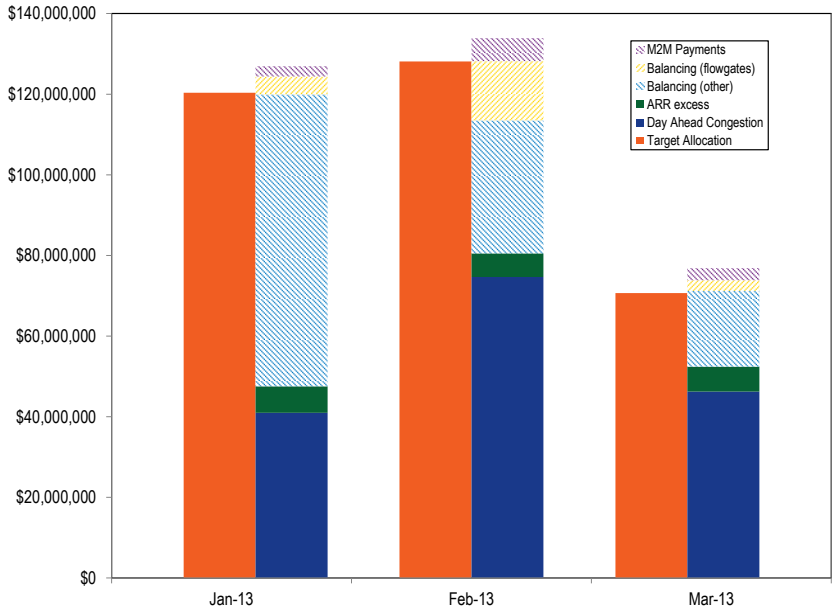


Figure 12-10 shows the monthly target allocation compared to the available positive and negative congestion revenue. The solid orange bar on the left of each month shows the monthly target allocation for all FTRs. The bar on the right of each month shows the positive and negative congestion dollars available 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 12-10 FTR target allocation compared to sources of positive and negative congestion revenue: January through March 2013



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.[19] 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 FTR auction participants' expectations of locational congestion price differences and the associated level of revenue sufficiency.[20]

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.

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.[21] 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

19 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.
20 For a more complete explanation, see the *2012 State of the Market Report for PJM*, Volume II, Section 12, "FTRs."
21 See PJM. "Manual 6: Financial Transmission Rights," Revision 12 (July 1, 2009), p. 28.

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 48,077 MW of ARRs associated with approximately $464,100 of revenue that were reassigned in the first ten 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 12-18 summarizes ARR MW and associated revenue automatically reassigned for network load in each control zone where changes occurred between June 2011 and March 2013.

Table 12-18 ARRs and ARR revenue automatically reassigned for network load changes by control zone: June 1, 2011, through March 31, 2013

	ARRs Reassigned (MW-day)		ARR Revenue Reassigned [Dollars (Thousands) per MW-day]	
Control Zone	2011/2012 (12 months)	2012/2013 (10 months)*	2011/2012 (12 months)	2012/2013 (10 months)*
AECO	563	447	$4.8	$2.3
AEP	6,341	4,303	$119.0	$54.2
AP	5,516	3,382	$319.4	$80.8
ATSI	3,321	4,382	$13.3	$7.3
BGE	2,745	3,037	$45.9	$35.3
ComEd	3,804	11,094	$59.1	$160.5
DAY	463	534	$0.6	$0.8
DEOK	NA	2,609	NA	$1.4
DLCO	2,964	2,525	$10.4	$17.8
DPL	1,957	1,846	$15.4	$10.6
Dominion	1	0	$0.0	$0.0
JCPL	1,332	1,149	$10.1	$4.6
Met-Ed	1,273	986	$20.9	$7.6
PECO	1,994	3,124	$21.9	$20.8
PENELEC	1,116	835	$21.2	$7.5
PPL	3,565	2,951	$38.1	$18.7
PSEG	2,325	1,971	$31.2	$14.0
Pepco	2,489	2,903	$27.4	$20.0
RECO	73	58	$0.0	$0.0
Total	41,770	48,077	$758.9	$464.1

* Through 31-Mar-2013

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 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 12-19 shows the Residual ARRs automatically allocated to eligible participants, along with the target allocations from the effective month.

Table 12-19 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
Jan-13	6,773.0	1,547.2	22.8%	$488,251
Feb-13	1,567.4	1,493.7	95.3%	$229,856
Mar-13	5,351.2	1,522.7	28.5%	$286,193

Market Performance

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 12-20 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 12-20 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 $624.6 million in credits from the FTR auctions during the first ten months of the 2012 to 2013 planning period, with an average hourly ARR credit of $0.63 per MW. During the first ten months of the 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 12-21 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 March 31, 2013) planning periods.

Table 12-21 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	$624.6
Annual FTR Auction net revenue	$1,029.6	$602.9
Monthly Balance of Planning Period FTR Auction net revenue*	$26.3	$21.7
ARR target allocations	$947.3	$565.4
ARR credits	$947.3	$565.4
Surplus auction revenue	$108.6	$59.1
ARR payout ratio	100%	100%
FTR payout ratio*	80.6%	74.8%

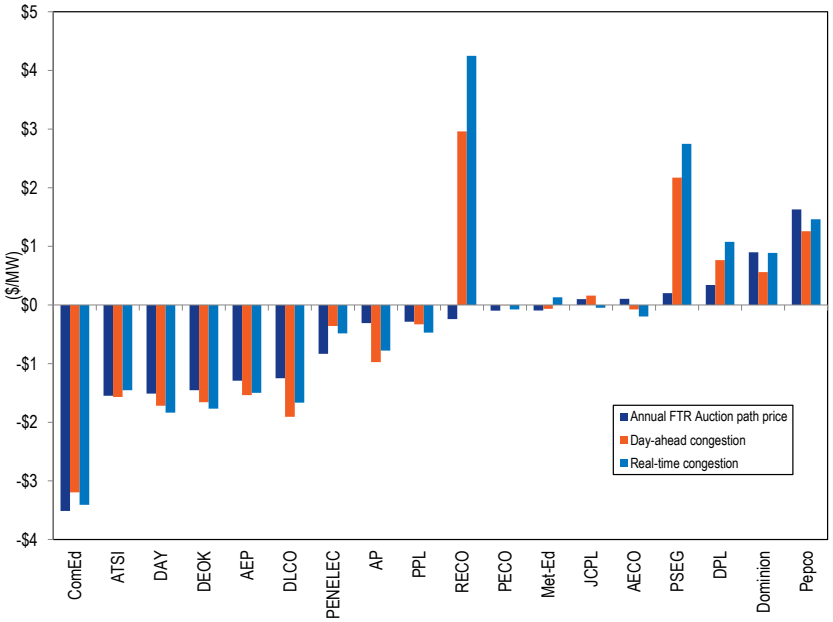
* Shows twelve months for 2011/2012 ten months for 2012/2013.

ARR and FTR Revenue and Congestion

FTR Prices and Zonal Price Differences

As an illustration of the relationship between FTRs and congestion, Figure 12-11 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 12-11 Annual FTR Auction prices vs. average day-ahead and real-time congestion for all control zones relative to the Western Hub[22]: first ten months of the 2012 to 2013 planning period



Effectiveness of ARRs as an Offset to Congestion

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

22 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 12-11.

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 12-22. ARRs and self-scheduled FTRs that sink at an aggregate are assigned to a control zone if applicable.[23] 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 69.5 percent of the target allocation for the first ten 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.

23 For Table 12-22 through Table 12-24, 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 12-22 ARR and self-scheduled FTR congestion offset (in millions) by control zone: first ten months of the 2012 to 2013 planning period[24]

Control Zone	ARR Credits	Self-Scheduled FTR Credits	Total Revenue	Congestion	Total Revenue - Congestion Difference	Percent Offset
AECO	$5.9	$0.0	$5.9	$6.8	($0.9)	87.0%
AEP	$25.3	$51.9	$77.2	$38.2	$61.8	>100%
APS	$40.4	$20.8	$61.2	$7.3	$63.1	>100%
ATSI	$4.1	$0.2	$4.3	($4.0)	$8.4	>100%
BGE	$30.3	$0.6	$30.8	$7.3	$23.8	>100%
ComEd	$101.8	$0.0	$101.8	($45.4)	$147.2	>100%
DAY	$1.5	$1.6	$3.0	($2.7)	$6.4	>100%
DEOK	$1.1	$0.0	$1.1	($5.0)	$6.1	>100%
DLCO	$5.9	$0.2	$6.1	($0.3)	$6.5	>100%
Dominion	$4.8	$50.9	$55.7	$13.6	$64.5	>100%
DPL	$11.4	$1.3	$12.8	$27.4	($14.0)	46.6%
External	$5.7	$0.4	$6.1	$2.6	$3.7	>100%
JCPL	$9.0	$0.2	$9.1	$9.7	($0.5)	93.7%
Met-Ed	$8.7	$0.1	$8.9	$5.1	$3.8	>100%
PECO	$16.9	$1.9	$18.8	$16.5	$3.1	>100%
PENELEC	$6.9	$4.5	$11.3	$6.3	$7.0	>100%
Pepco	$24.8	$1.4	$26.2	$24.5	$2.2	>100%
PPL	$18.3	$1.1	$19.4	$6.3	$13.6	>100%
PSEG	$26.1	$7.0	$33.1	($15.4)	$51.5	>100%
RECO	$0.0	$0.0	$0.0	$1.2	($1.2)	0.1%
Total	$349.1	$143.8	$492.9	$100.1	$473.7	>100%

Effectiveness of ARRs and FTRs as an Offset to Congestion

Table 12-23 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 69.5 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.[25] The last column shows the difference between the total ARR and FTR offset and the congestion cost for each control zone.

24 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.

25 The total zonal congestion numbers were calculated as of April 24, 2013 and may change as a result of continued PJM billing updates.

Table 12-23 ARR and FTR congestion offset (in millions) by control zone: first ten months of the 2012 to 2013 planning period

Control Zone	ARR Credits	FTR Credits	FTR Auction Revenue	Total ARR and FTR Offset	Congestion	Total Offset - Congestion Difference	Percent Offset
AECO	$5.9	($0.3)	$6.5	($0.9)	$3.3	($4.2)	0.0%
AEP	$105.5	$88.8	$121.9	$72.4	$92.2	($19.9)	78.5%
APS	$76.2	$23.8	$40.1	$59.9	$71.2	($11.3)	84.1%
ATSI	$4.3	$11.3	($0.9)	$16.5	($1.1)	$17.6	>100%
BGE	$31.6	$23.1	$43.1	$11.6	$23.3	($11.6)	49.9%
ComEd	$121.4	$78.3	$81.7	$118.0	$141.3	($23.2)	83.6%
DAY	$3.8	$5.3	$5.3	$3.8	$4.7	($0.9)	81.1%
DEOK	$1.4	$5.2	$4.0	$2.6	$1.7	$0.9	>100%
DLCO	$7.2	($0.3)	$7.5	($0.5)	$2.9	($3.4)	0.0%
Dominion	$79.3	$70.2	$110.2	$39.3	$67.1	($27.8)	58.5%
DPL	$12.3	$21.4	$19.8	$13.8	$16.4	($2.6)	84.3%
External	$7.0	($0.5)	$1.7	$4.9	($23.6)	$28.5	>100%
JCPL	$9.3	$22.1	$22.0	$9.4	$12.1	($2.7)	78.0%
Met-Ed	$9.0	$7.3	$16.0	$0.3	$1.9	($1.6)	17.0%
PECO	$20.1	$12.7	$17.7	$15.1	($0.9)	$15.9	>100%
PENELEC	$11.8	$23.6	$30.0	$5.4	$34.7	($29.2)	15.6%
Pepco	$27.1	$35.0	$83.1	($21.0)	$29.6	($50.7)	0.0%
PPL	$21.0	$4.3	$9.6	$15.6	$11.6	$4.0	>100%
PSEG	$24.0	$97.5	$34.5	$87.0	$16.0	$71.0	>100%
RECO	$0.0	$1.6	($1.8)	$3.3	$4.1	($0.8)	81.1%
Total	$578.3	$530.1	$651.9	$456.6	$508.6	($52.0)	89.8%

Table 12-24 shows the total offset due to ARRs and FTRs for the entire 2011 to 2012 planning period and the first ten months of the 2012 to 2013 planning period.

Table 12-24 ARR and FTR congestion hedging (in millions): Planning periods 2011 to 2012 and 2012 to 2013 through March 31, 2013[26]

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*	$578.3	$530.1	$651.9	$456.6	$508.6	($52.0)	89.8%

* Shows ten months ended 31-Mar-13

26 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.