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 June*, focuses on the Annual and Monthly Balance of Planning Period FTR Auctions during the 2012 to 2013 and 2013 to 2014 planning periods, covering June 1, 2012 through June 30, 2013.

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."

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**

- 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.
- Market 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. The market design incorporates widespread cross subsidies which are not consistent with an efficient market design.

Overview

Financial Transmission Rights

Market Structure

- **Supply.** Market participants can also sell FTRs. In the 2013 to 2014 Annual FTR Auction, total participant FTR sell offers were 417,118 MW, up from 356,299 MW in the 2012 to 2013 planning period. In the Monthly Balance of Planning Period FTR Auctions for the 2012 to 2013 planning period, total participant FTR sell offers were 5,010,437 MW, down from 5,852,635 MW for the same period during the 2011 to 2012 planning period.

- **Demand.** There were 3,274,373 MW of buy and self-scheduled bids in the 2013 to 2014 Annual FTR Auction, up from 2,561,835 MW in the previous planning period. The total FTR buy bids from the Monthly Balance of Planning Period FTR Auctions for the 2012 to 2013 planning period increased 11.6 percent from 17,634,256 MW for the same time period of the prior planning period, to 19,685,688 MW.
- **Patterns of Ownership.** For the 2013 to 2014 Annual FTR Auction, financial entities purchased 54.7 percent of prevailing flow FTRs and 82.2 percent of counter flow FTRs. For the Monthly Balance of Planning Period Auctions, financial entities purchased 73.4 percent of prevailing flow and 83.1 percent of counter flow FTRs for January through June of 2013. Financial entities owned 59.0 percent of all prevailing and counter flow FTRs, including 50.6 percent of all prevailing flow FTRs and 75.3 percent of all counter flow FTRs during January through June 2013.

Market Behavior

- **FTR Forfeitures.** Total forfeitures for the 2012 to 2013 planning period were $523,227 for Increment Offers and Decrement Bids.
- **Credit Issues.** Six participants defaulted during 2013 from ten default events. The average of these defaults was $55,939 with seven based on inadequate collateral and three based on nonpayment. The average collateral default was $16,587 and the average nonpayment default was $147,761. The majority of these defaults were promptly cured, with one partial cure. These defaults were not necessarily related to FTR positions.

Market Performance

- **Volume.** In the Annual FTR Auction for the 2013 to 2014 planning period 420,489 MW (12.8 percent) of buy and self-schedule bids cleared. For the 2012 to 2013 planning period, the Monthly Balance of Planning Period FTR Auctions cleared 2,246,640 MW (11.4 percent) of FTR buy bids and 737,111 MW (14.7 percent) of FTR sell offers.
- **Price.** The weighted-average buy-bid FTR price for the 2013 to 2014 Annual FTR Auction was $0.13 per MW, down from $0.23 per MW in the 2012 to 2013 planning period. The weighted-average buy-bid FTR price in the Monthly Balance of Planning Period FTR Auctions for the 2012 to 2013 planning period was $0.09, down from $0.14 per MW in the 2011 to 2012 planning period.
- **Revenue.** The 2013 to 2014 Annual FTR Auction generated $558.4 million in net revenue, down $44.5 million in the 2012 to 2013 Annual FTR Auction. The Monthly Balance of Planning Period FTR Auctions generated $23.9 million in net revenue for all FTRs for the 2012 to 2013 planning period, down from $26.3 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 entire 2011 to 2012 planning period. FTRs were paid at 67.8 percent of the target allocation level for the entire 2012 to 2013 planning period. Congestion revenues are allocated to FTR holders based on FTR target allocations. PJM collected $614.0 million of FTR revenues during the 2012 to 2013 planning period and $799.1 million during the 2011 to 2012 planning period. For the 2013 to 2014 planning period, the top sink and top source with the highest positive FTR target allocations were Dominion Zone and Mt. Storm. Similarly, the top sink and top source with the largest negative FTR target allocations were Quad Cities and Buchanan.
- **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 $83.7 million in profits for physical entities, of which $90.3 million was from self-scheduled FTRs, and $61.2 million for financial entities. As shown in Table 12-13, 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 17,467.5 MW of residual ARRs with a total target allocation of $5,083,608.

- **ARR Reassignment for Retail Load Switching.** There were 52,825 MW of ARRs associated with approximately $498,800 of revenue that were reassigned in 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

- **Revenue Adequacy.** For the 2012 to 2013 planning period, the ARR target allocations were $570.5 million while PJM collected $626.7 million from the combined Long Term, Annual and Monthly Balance of Planning Period FTR Auctions, 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 92.6 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.

Recommendations

- Report correct monthly payout ratios to reduce overstatement of underfunding problem on a monthly basis.
- Eliminate portfolio netting to eliminate cross subsidies across FTR marketplace participants.
- Eliminate subsidies to counter flow FTR holders by treating them comparably to prevailing flow FTR holders when the payout ratio is applied.
- Eliminate cross geographic subsidies.
- Improve transmission outage modeling in the FTR auction models.
- Reduce FTR sales on paths with persistent underfunding including clear rules for what defines persistent underfunding and how the reduction will be applied.
- Implement a seasonal ARR and FTR allocation system to better represent outages.
- Eliminate over allocation requirement of ARRs in the Annual ARR Allocation process.

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. ARR holders do have those rights based on their payment for the transmission system. 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 modeling differences between the day-ahead and real time. Such differences are not an indication that FTR holders are being underallocated total congestion dollars.

The market response to the revenue adequacy issue has been to reduce bid prices and to increase bid volumes and offer volumes. Clearing prices have fallen and cleared quantities have increased.

In the 2010 to 2011 planning period the clearing price for an FTR obligation was $0.71 per MW, and in the 2013 to 2014 planning period the clearing price was $0.30 per MW, a 57.7 percent decrease. In the 2010 to 2011 planning period, the clearing price for FTR Obligation sell offers was $0.22 per MW, and in the 2013 to 2014 planning period was $0.05 per MW for, a 340 percent decrease.

The volume of cleared buy bids and self-scheduled bids in the Annual FTR Auctions increased from 287,294 MW in the 2010 to 2011 planning period to 420,489 MW in the 2013 to 2014 planning period, an increase of 133,095 MW or 115.9 percent. The volume of cleared sell offers increased from 10,315 MW in the 2010 to 2011 planning period to 37,821 MW in the 2013 to 2014 planning period, an increase of 266.7 percent.

In June 2010, which includes the Annual, Long Term and monthly auctions, the bid volume was 3,894,566 MW, with a net bid volume of 3,177,131 MW. The net bid volume is the buy bid volume minus the sell bid volume. In June 2013 the bid volume was 7,909,805 MW (a 103.1 percent increase) and the net bid volume was 6,607,570 MW (a 108.0 percent increase). The net bid volume to bid volume ratio in June 2010 was 0.82, while the ratio was 0.84 in June 2013, indicating a slight increase in the ratio of sell offers to buy bids.

The payout ratio reported by PJM monthly is understated. The PJM reported monthly payout ratio does not appropriately consider negative target allocations as a source of revenue to fund FTRs on a monthly basis. The MMU recommends that the calculation of the monthly 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. This should also be extended to include the end of planning period FTR uplift calculation. The net of a participant's portfolio should not determine their FTR uplift liability, rather their portion of total positive target allocations should be used to determine a participant's uplift charge.

If netting within portfolios were eliminated and the payout ratio were calculated correctly, the payout ratio in the 2012 to 2013 planning period would have been 84.6 percent instead of the reported 67.8 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 2012 to 2013 planning period from the reported 67.8 percent to 88.6 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; reduced FTR capability on persistently underfunded pathways. 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.[4] 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. Available revenue to pay FTR holders is based on the amount of Day-Ahead and Balancing congestion collected, along with Market to Market payments, excess ARR revenues available at the end of a month and any charges made to Day-Ahead Operating Reserves.

FTR funding is not on a path specific basis or on a time specific basis. There are widespread 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 at the end of the planning period. 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.

4 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."

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 classes of FTR 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 following three consecutive planning years. 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 classes. FTR self-scheduled bids are available only as obligations and 24-hour class, 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.[5] 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 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.[6] But the auction process does not

5 See PJM. "Manual 6: Financial Transmission Rights," Revision 13 (June 28, 2012), p. 38.
6 See PJM. "Manual 6: Financial Transmission Rights," Revision 13 (June 28, 2012), p. 54.

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 or may not be planned in advance or may be emergency outages. In addition, it is difficult to model in an annual auction two outages of similar significance and similar duration in different areas which do not overlap in time. The choice of which to model may have significant distributional consequences.

Annual FTR Auctions

Figure 12-1 shows the geographic location of the top ten binding constraints from the 2013 to 2014 Annual FTR Auction and the 2013 to 2014 Annual ARR allocation. Many of the top binding constraints are flowgates and the binding constraints are primarily concentrated near the PJM-MISO border.

Figure 12-1 Geographic location of top five binding constraints for the Annual FTR Auction and Annual ARR Allocation: Planning period 2013 to 2014

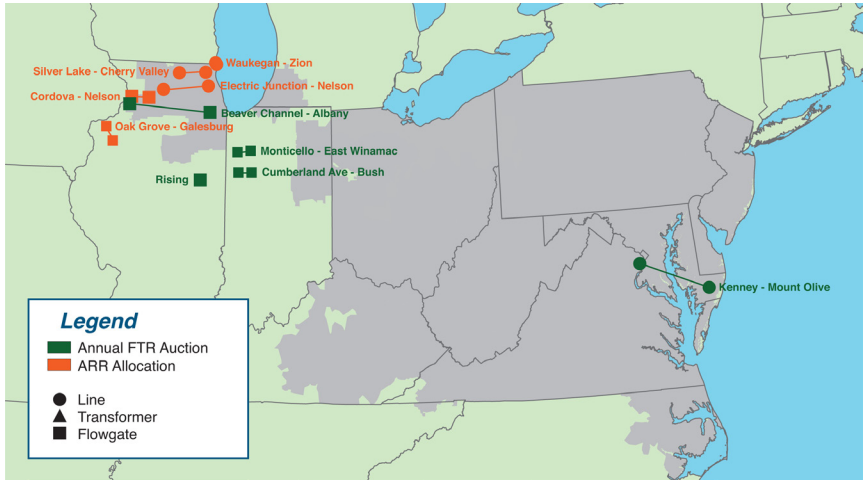


Table 12-2 shows the top 10 binding constraints for the 2013 to 2014 Annual FTR Auction based on the marginal value of on peak hours. The severity ranking is based on the marginal value of the constraint in the simultaneous feasibility test.

Table 12-2 Top 10 principal binding transmission constraints limiting the Annual FTR Auction: Planning period 2013 to 2014

			Severity Ranking by Auction Round			
Constraint	Type	Control Zone	1	2	3	4
Cumberland Ave - Bush	Flowgate	MISO	1	1	1	1
Beaver Channel - Albany	Flowgate	MISO	2	3	2	3
Monticello - East Winamac	Flowgate	MISO	3	2	3	2
Rising	Flowgate	MISO	NA	NA	NA	4
Kenney - Mount Olive	Line	DPL	7	NA	4	5
Roxbury - Shade Gap	Line	PENELEC	4	8	8	10
Prairie State - W. Mt. Vernon	Flowgate	MISO	5	5	10	NA
Glenarm - Windy Edge	Line	BGE	6	7	5	6
Kenney - Stockton	Line	DPL	NA	4	NA	NA
Pana North	Flowgate	MISO	8	6	6	NA

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 withdrawals. 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 customer or PJM member 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 and off peak products.[7]

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

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

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 in the 2013 to 2014 Annual FTR Auction were 3,274,373 MW. The total FTR buy bids in the Monthly Balance of Planning Period FTR Auctions for the 2012 to 2013 planning period were 19,685,688 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 12-3 presents the Annual FTR Auction cleared FTRs for the 2013 to 2014 planning period by trade type, organization type and FTR direction. In the Annual FTR Auction for the 2013 to 2014 planning period, financial entities purchased 54.7 percent of prevailing flow FTRs and 82.2 percent of counter flow FTRs, with the result that financial entities purchased 61.5 percent of all Annual FTR Auction cleared buy bids for the 2013 to 2014 planning period.

Table 12-3 Annual FTR Auction patterns of ownership by FTR direction: Planning period 2013 to 2014

			FTR Direction		
Trade Type	Organization Type	Self-Scheduled FTRs	Prevailing Flow	Counter Flow	All
Buy Bids	Physical	Yes	9.2%	0.2%	7.0%
		No	36.1%	17.5%	31.5%
		Total	45.3%	17.8%	38.5%
	Financial	No	54.7%	82.2%	61.5%
	Total		100.0%	100.0%	100.0%
Sell Offers	Physical		20.7%	19.0%	20.2%
	Financial		79.3%	81.0%	79.8%
	Total		100.0%	100.0%	100.0%

Table 12-4 presents the Monthly Balance of Planning Period FTR Auction cleared FTRs for January through June 2013 by trade type, organization type and FTR direction. Financial entities purchased 73.4 percent of prevailing flow and 83.1 percent of counter flow FTRs for the first six months of the year, with the result that financial entities purchased 77.1 percent of all prevailing and counter flow FTR buy bids in the Monthly Balance of Planning Period FTR Auction cleared FTRs for January through June 2013.

Table 12-4 Monthly Balance of Planning Period FTR Auction patterns of ownership by FTR direction: January through June 2013

		FTR Direction		
Trade Type	Organization Type	Prevailing Flow	Counter Flow	All
Buy Bids	Physical	26.6%	16.9%	22.9%
	Financial	73.4%	83.1%	77.1%
	Total	100.0%	100.0%	100.0%
Sell Offers	Physical	32.7%	32.9%	32.7%
	Financial	67.3%	67.1%	67.3%
	Total	100.0%	100.0%	100.0%

Table 12-5 presents the daily net position ownership for all FTRs for January through June 2013, by FTR direction.

Table 12-5 Daily FTR net position ownership by FTR direction: January through June 2013

	FTR Direction		
Organization Type	Prevailing Flow	Counter Flow	All
Physical	49.4%	24.7%	41.0%
Financial	50.6%	75.3%	59.0%
Total	100.0%	100.0%	100.0%

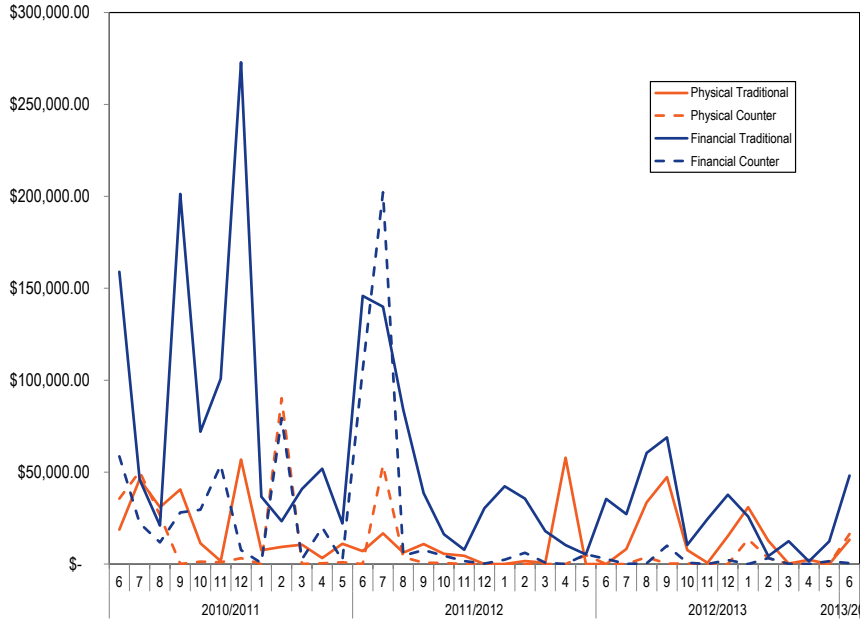
Market Behavior

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 12-2 shows the FTR forfeitures values for both counter flow and prevailing flow FTRs for each month of June 2010 through June 2013 by company type. Total forfeitures for the 2012 to 2013 planning period were $519,317 (0.06 percent of total FTR target allocations).

Figure 12-2 Monthly FTR Forfeitures for physical and financial participants: June 2010 through June 2013



Credit Issues

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

Six participants defaulted during 2013 from ten default events. The average of these defaults was $55,939 with seven based on inadequate collateral and three based on nonpayment. The average collateral default was $16,587 and the average nonpayment default was $147,761. The majority of these defaults were promptly cured, with one partial cure.

Market Performance

Volume

Table 12-6 provides the Annual FTR Auction market volume for the 2013 to 2014 planning period. Total FTR buy bids were 3,274,373 MW, up 27.8 percent from 2,561,835 MW for the previous planning period. For the 2013 to 2014 planning period 391,148 MW (12.1 percent) of buy bids cleared, up 5.3 percent from 371,295 MW for the last planning period. There were 417,118 MW of sell offers with 37,821 MW (9.1 percent) clearing for the 2013 to 2014 planning period.

Table 12-6 Annual FTR Auction market volume: Planning period 2013 to 2014

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	76,647	365,441	103,814	28.4%	261,627	71.6%
		Prevailing Flow	234,724	1,650,737	225,006	13.6%	1,425,731	86.4%
		Total	311,371	2,016,178	328,820	16.3%	1,687,358	83.7%
	Options	Counter Flow	172	8,829	0	0.0%	8,829	100.0%
		Prevailing Flow	42,659	1,220,026	62,328	5.1%	1,157,698	94.9%
		Total	42,831	1,228,855	62,328	5.1%	1,166,527	94.9%
	Total	Counter Flow	76,819	374,269	103,814	27.7%	270,455	72.3%
		Prevailing Flow	277,383	2,870,763	287,334	10.0%	2,583,430	90.0%
		Total	354,202	3,245,033	391,148	12.1%	2,853,885	87.9%
Self-scheduled bids	Obligations	Counter Flow	129	231	231	100.0%	0	0.0%
		Prevailing Flow	2,847	29,110	29,110	100.0%	0	0.0%
		Total	2,976	29,341	29,341	100.0%	0	0.0%
Buy and self-scheduled bids	Obligations	Counter Flow	76,776	365,672	104,045	28.5%	261,627	71.5%
		Prevailing Flow	237,571	1,679,847	254,116	15.1%	1,425,731	84.9%
		Total	314,347	2,045,518	358,161	17.5%	1,687,358	82.5%
	Options	Counter Flow	172	8,829	0	0.0%	8,829	100.0%
		Prevailing Flow	42,659	1,220,026	62,328	5.1%	1,157,698	94.9%
		Total	42,831	1,228,855	62,328	5.1%	1,166,527	94.9%
	Total	Counter Flow	76,948	374,500	104,045	27.8%	270,455	72.2%
		Prevailing Flow	280,230	2,899,873	316,444	10.9%	2,583,430	89.1%
		Total	357,178	3,274,373	420,489	12.8%	2,853,885	87.2%
Sell offers	Obligations	Counter Flow	36,423	144,023	11,356	7.9%	132,667	92.1%
		Prevailing Flow	54,723	262,545	25,761	9.8%	236,784	90.2%
		Total	91,146	406,568	37,117	9.1%	369,451	90.9%
	Options	Counter Flow	1	1	0	0.0%	1	100.0%
		Prevailing Flow	406	10,549	704	6.7%	9,845	93.3%
		Total	407	10,550	704	6.7%	9,846	93.3%
	Total	Counter Flow	36,424	144,024	11,356	7.9%	132,668	92.1%
		Prevailing Flow	55,129	273,095	26,465	9.7%	246,630	90.3%
		Total	91,553	417,118	37,821	9.1%	379,297	90.9%

Table 12-7 provides the Monthly Balance of Planning Period FTR Auction market volume for the entire 2012 to 2013 planning period and the first month of the 2013 to 2014 planning period. There were 12,956,832 MW of FTR buy bid obligations and 3,922,225 MW of FTR sell offer obligations for all bidding periods in the 2012 to 2013 planning period. The monthly balance of planning period auctions cleared 2,171,751 MW (16.8 percent) of FTR buy bid obligations and 468,426 MW (11.9 percent) of FTR sell off obligations.

There were 6,728,856 MW of FTR buy bid options and 1,088,212 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. The monthly auctions cleared 74,889 MW (1.1 percent) of FTR buy bid options, and 268,684 MW (24.7 percent) of FTR sell offers.

Table 12-7 Monthly Balance of Planning Period FTR Auction market volume: January through June 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%
Apr-13	Obligations	Buy bids	130,671	742,450	143,747	19.4%	598,703	80.6%
		Sell offers	55,739	206,725	33,203	16.1%	173,522	83.9%
	Options	Buy bids	1,852	47,911	4,069	8.5%	43,842	91.5%
		Sell offers	6,017	58,130	17,259	29.7%	40,870	70.3%
May-13	Obligations	Buy bids	99,964	562,240	119,522	21.3%	442,718	78.7%
		Sell offers	25,028	93,603	19,917	21.3%	73,686	78.7%
	Options	Buy bids	792	33,223	2,901	8.7%	30,322	91.3%
		Sell offers	2,634	24,643	15,506	62.9%	9,137	37.1%
Jun-13	Obligations	Buy bids	268,004	1,548,839	275,485	17.8%	1,273,354	82.2%
		Sell offers	150,754	474,950	59,536	12.5%	415,415	87.5%
	Options	Buy bids	4,155	313,972	14,825	4.7%	299,147	95.3%
		Sell offers	23,090	198,850	55,455	27.9%	143,395	72.1%
2012/2013*	Obligations	Buy bids	2,255,105	12,956,832	2,171,751	16.8%	10,785,081	83.2%
		Sell offers	1,080,775	3,922,225	468,426	11.9%	3,453,798	88.1%
	Options	Buy bids	103,926	6,728,856	74,889	1.1%	6,653,967	98.9%
		Sell offers	149,274	1,088,211	268,684	24.7%	819,527	75.3%
2013/2014**	Obligations	Buy bids	268,004	1,548,839	275,485	17.8%	1,273,354	82.2%
		Sell offers	150,754	474,950	59,536	12.5%	415,415	87.5%
	Options	Buy bids	4,155	313,972	14,825	4.7%	299,147	95.3%
		Sell offers	23,090	198,850	55,455	27.9%	143,395	72.1%

* Shows Twelve Months for 2012/2013; ** Shows one month ended 30-Jun-13 for 2013/2014

Table 12-8 presents the buy-bid, bid and cleared volume of the Monthly Balance of Planning Period FTR Auction, and the effective periods for the volume. The average monthly cleared volume for January through June 2013 is 183,252.2 MW. The average monthly cleared volume for January through June 2012 was 149,141.2 MW.

Table 12-8 Monthly Balance of Planning Period FTR Auction buy-bid, bid and cleared volume (MW per period): January through June 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
Apr-13	Bid	610,571	179,789						790,360
	Cleared	127,896	19,920						147,816
May-13	Bid	595,463							595,463
	Cleared	122,423							122,423
Jun-13	Bid	766,947	218,427	205,723	112,180	195,196	193,766	170,571	1,862,810
	Cleared	141,332	31,035	25,346	14,149	27,397	25,560	25,491	290,310

Figure 12-3 shows cleared auction volumes as a percent of the total FTR cleared volume by calendar months for June 2004 through June 2013, 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 June 2013

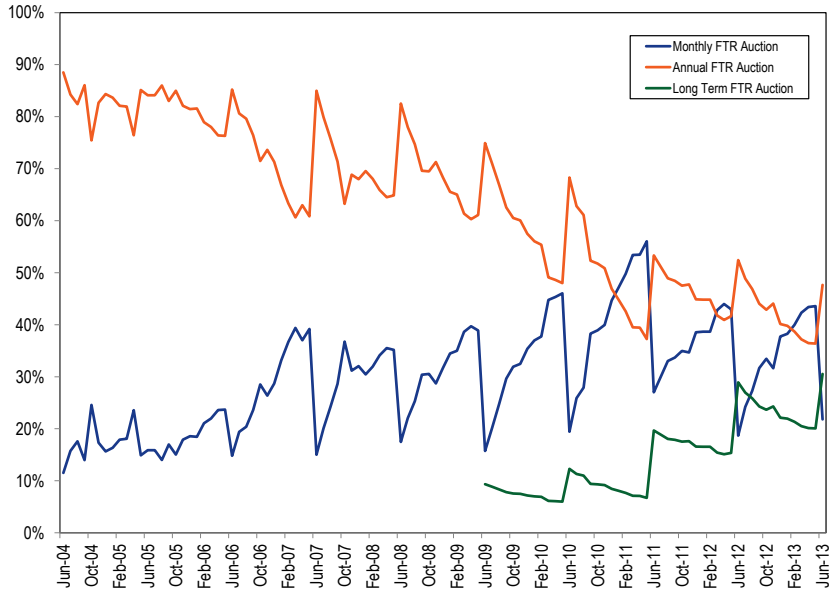


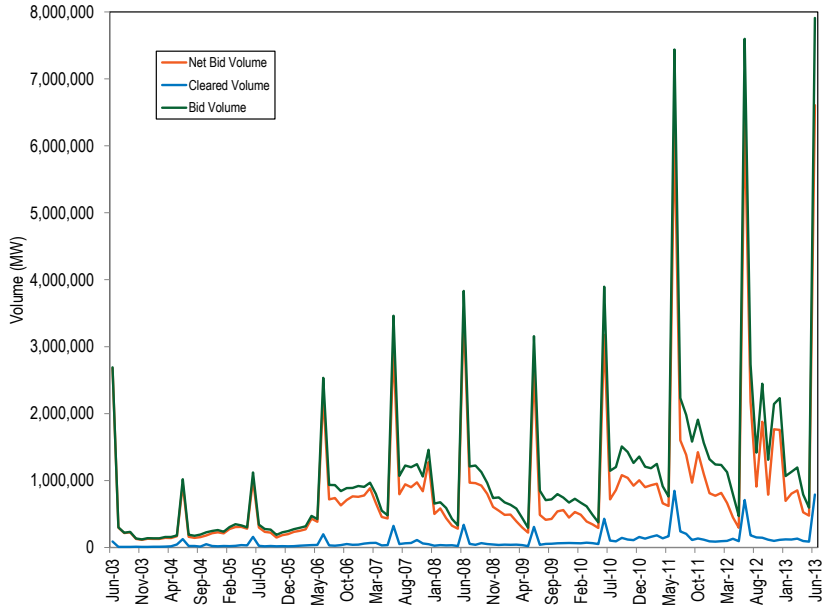
Table 12-9 provides the secondary bilateral FTR market volume for the entire 2011 to 2012 and 2012 to 2013 planning periods.

Table 12-9 Secondary bilateral FTR market volume: Planning periods 2011 to 2012 and 2012 to 2013[8]

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	95
		On Peak	137
		Off Peak	60
		Total	292
	Option	24-Hour	0
		On Peak	0
		Off Peak	0
		Total	0

Figure 12-4 shows the FTR bid, cleared and net bid volume from June 2003 through June 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.

Figure 12-4 Long Term, Annual and Monthly FTR Auction bid and cleared volume: June 2003 through June 2013



Price

Table 12-10 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 2013 to 2014 planning period. The weighted-average buy-bid FTR price in the 2013 to 2014 Annual FTR Auction was $0.13 per MW, down from $0.23 per MW in the 2012 to 2013 planning period.

8 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.

Table 12-10 Annual FTR Auction weighted-average cleared prices (Dollars per MW): Planning period 2013 to 2014

			Class Type			
Trade Type	Hedge Type	FTR Direction	24-Hour	On Peak	Off Peak	All
Buy bids	Obligations	Counter Flow	($0.17)	($0.30)	($0.15)	($0.22)
		Prevailing Flow	$0.59	$0.51	$0.32	$0.43
		Total	$0.45	$0.27	$0.16	$0.23
	Options	Counter Flow	$0.00	$0.00	$0.00	$0.00
		Prevailing Flow	$1.19	$0.17	$0.10	$0.13
		Total	$1.19	$0.17	$0.10	$0.13
Self-scheduled bids	Obligations	Counter Flow	($0.24)	NA	NA	($0.24)
		Prevailing Flow	$0.73	NA	NA	$0.73
		Total	$0.72	NA	NA	$0.72
Buy and self-scheduled bids	Obligations	Counter Flow	($0.18)	($0.30)	($0.15)	($0.22)
		Prevailing Flow	$0.69	$0.51	$0.32	$0.49
		Total	$0.64	$0.27	$0.16	$0.30
	Options	Counter Flow	$0.00	$0.00	$0.00	$0.00
		Prevailing Flow	$1.19	$0.17	$0.10	$0.13
		Total	$1.19	$0.17	$0.10	$0.13
Sell offers	Obligations	Counter Flow	($1.95)	($0.57)	($0.35)	($0.54)
		Prevailing Flow	$0.35	$0.38	$0.21	$0.30
		Total	($0.18)	$0.14	$0.02	$0.05
	Options	Counter Flow	NA	NA	NA	NA
		Prevailing Flow	$0.00	$0.07	$0.07	$0.07
		Total	$0.00	$0.07	$0.07	$0.07

Figure 12-5 shows the weighted-average cleared buy-bid price frequency for the 2013 to 2014 Annual FTR Auction. 92.9 percent of Annual FTRs were purchased for less than $1 per MW.

Figure 12-5 Annual FTR Auction clearing price per MW: Planning period 2013 to 2014

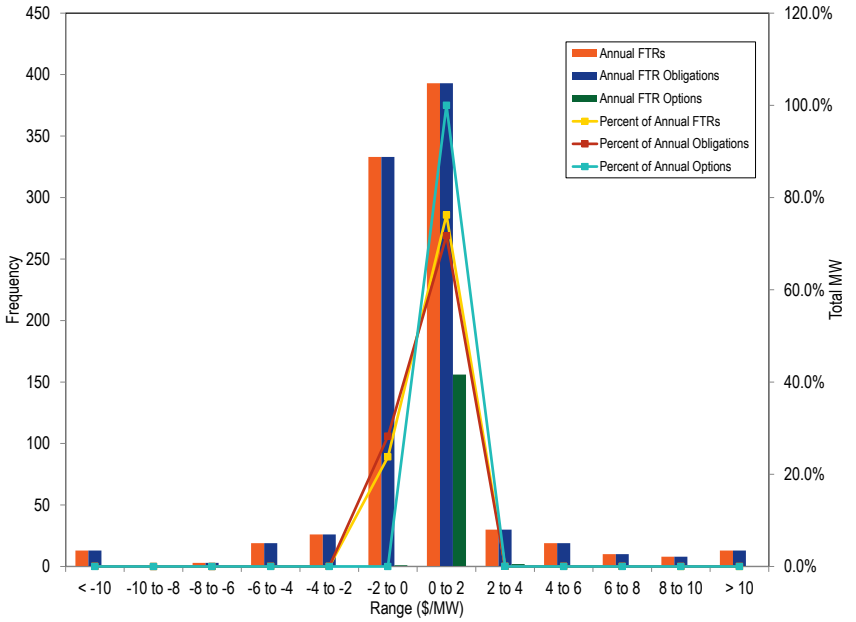


Table 12-11 shows the weighted-average cleared buy-bid price in the Monthly Balance of Planning Period FTR Auctions by bidding period for January 2013 through June 2013. For example, for the January 2013 Monthly Balance of Planning Period FTR Auction, the current month column is January, the second month 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 for January through June 2013 was $0.09 per MW, down from $0.14 per MW in the same time last year.

Table 12-11 Monthly Balance of Planning Period FTR Auction cleared, weighted-average, buy-bid price per period (Dollars per MW): January through June 2013

Monthly Auction	Prompt Month	Second Month	Third Month	Q1	Q2	Q3	Q4	Total
Jan-13	$0.11	$0.20	$0.05				$0.09	$0.11
Feb-13	$0.09	$0.12	$0.10				$0.13	$0.10
Mar-13	$0.10	$0.12	$0.10				$0.05	$0.10
Apr-13	$0.10	$0.16						$0.11
May-13	$0.09	$0.00						$0.09
Jun-13	$0.08	$0.21	$0.19	$0.15	$0.16	$0.14	$0.10	$0.06

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 is paid and the FTR credits are the cost to the FTR holder, which the FTR holder must pay. The cost of self-scheduled FTRs is zero. ARR holders that self schedule FTRs purchase the FTRs in the Annual FTR Auction, but the ARR holders receive offsetting ARR credits that equal the purchase price of the FTRs. Table 12-12 lists FTR profits by organization type and FTR direction for the period from January through June, 2013. FTR profits are the sum of the daily FTR credits, including for 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 $83.7 million in profits for physical entities, of which $90.3 million was from self-scheduled FTRs, and $61.2 million for financial entities.

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

	FTR Direction				
Organization Type	Prevailing Flow	Self Scheduled Prevailing Flow	Counter Flow	Self Scheduled Counter Flow	All
Physical	($33,880,475)	$90,346,068	$25,201,278	$2,030,678	$83,697,550
Financial	$2,865,974	NA	$58,329,046	NA	$61,195,020
Total	($31,014,501)	$90,346,068	$83,530,324	$2,030,678	$144,892,570

Table 12-13 lists the monthly FTR profits in 2013 by organization type.

Table 12-13 Monthly FTR profits by organization type: January through June 2013

	Organization Type			
Month	Physical	Self Scheduled Physical FTRs	Financial	Total
Jan	$4,433,798.26	$24,630,018.53	$13,640,158.47	$42,703,975.26
Feb	$14,090,796.32	$20,676,306.40	$16,980,941.03	$51,748,043.75
Mar	$(9,498,907.60)	$15,149,289.30	$4,849,731.20	$10,500,112.90
Apr	$(12,666,550.49)	$6,571,358.42	$2,187,795.84	$(3,907,396.23)
May	$(3,242,261.28)	$14,590,963.47	$12,513,107.45	$23,861,809.65
Jun	$(1,796,071.62)	$10,758,810.69	$11,023,285.97	$19,986,025.04
Total	$(8,679,196.40)	$92,376,746.83	$61,195,019.96	$144,892,570.38

Revenue

Annual FTR Auction Revenue

Table 12-14 shows the Annual FTR Auction revenue by trade type, hedge type, FTR direction and class type. The Annual FTR Auction for the 2013 to 2014 planning period generated $558.4 million, down 7.4 percent from $602.9 million in the 2012 to 2013 planning period, and down 45.8 percent from the 2011 to 2012 planning period. Counter flow FTR holders received $73.5 million from the auction and prevailing flow FTR holders paid $631.9 million.

Table 12-14 Annual FTR Auction revenue: Planning period 2013 to 2014

			Class Type			
Trade Type	Type	FTR Direction	24-Hour	On Peak	Off Peak	All
Buy bids	Obligations	Counter Flow	($3,584,655)	($61,297,999)	($34,970,300)	($99,852,954)
		Prevailing Flow	$57,603,843	$244,753,274	$143,657,697	$446,014,815
		Total	$54,019,189	$183,455,275	$108,687,397	$346,161,861
	Options	Counter Flow	$0	$0	$0	$0
		Prevailing Flow	$773,687	$20,414,078	$15,109,880	$36,297,645
		Total	$773,687	$20,414,078	$15,109,880	$36,297,645
	Total	Counter Flow	($3,584,655)	($61,297,999)	($34,970,300)	($99,852,954)
		Prevailing Flow	$58,377,530	$265,167,352	$158,767,577	$482,312,460
		Total	$54,792,875	$203,869,353	$123,797,277	$382,459,506
Self-scheduled bids	Obligations	Counter Flow	($484,421)	NA	NA	($484,421)
		Prevailing Flow	$185,666,567	NA	NA	$185,666,567
		Total	$185,182,146	NA	NA	$185,182,146
Buy and self-scheduled bids	Obligations	Counter Flow	($4,069,076)	($61,297,999)	($34,970,300)	($100,337,375)
		Prevailing Flow	$243,270,411	$244,753,274	$143,657,697	$631,681,382
		Total	$239,201,335	$183,455,275	$108,687,397	$531,344,007
	Options	Counter Flow	$0	$0	$0	$0
		Prevailing Flow	$773,687	$20,414,078	$15,109,880	$36,297,645
		Total	$773,687	$20,414,078	$15,109,880	$36,297,645
	Total	Counter Flow	($4,069,076)	($61,297,999)	($34,970,300)	($100,337,375)
		Prevailing Flow	$244,044,097	$265,167,352	$158,767,577	$667,979,027
		Total	$239,975,022	$203,869,353	$123,797,277	$567,641,652
Sell offers	Obligations	Counter Flow	($6,178,881)	($10,761,004)	($9,879,378)	($26,819,263)
		Prevailing Flow	$3,672,742	$21,045,102	$11,155,364	$35,873,207
		Total	($2,506,139)	$10,284,097	$1,275,986	$9,053,944
	Options	Counter Flow	$0	$0	$0	$0
		Prevailing Flow	$0	$87,616	$133,050	$220,666
		Total	$0	$87,616	$133,050	$220,666
	Total	Counter Flow	($6,178,881)	($10,761,004)	($9,879,378)	($26,819,263)
		Prevailing Flow	$3,672,742	$21,132,718	$11,288,414	$36,093,874
		Total	($2,506,139)	$10,371,714	$1,409,036	$9,274,610
Total			$242,481,161	$193,497,639	$122,388,241	$558,367,042

Figure 12-6 summarizes the total revenue associated with all FTRs, regardless of source, to the FTR sinks that produced the largest positive and negative revenue in the Annual FTR Auction for the 2013 to 2014 planning period. The top ten positive revenue sinks accounted for 65.0 percent of total revenue. The top ten negative revenue sinks accounted for 3.9 percent of total revenue.

Figure 12-6 Ten largest positive and negative revenue producing FTR sinks purchased in the Annual FTR Auction: Planning period 2013 to 2014

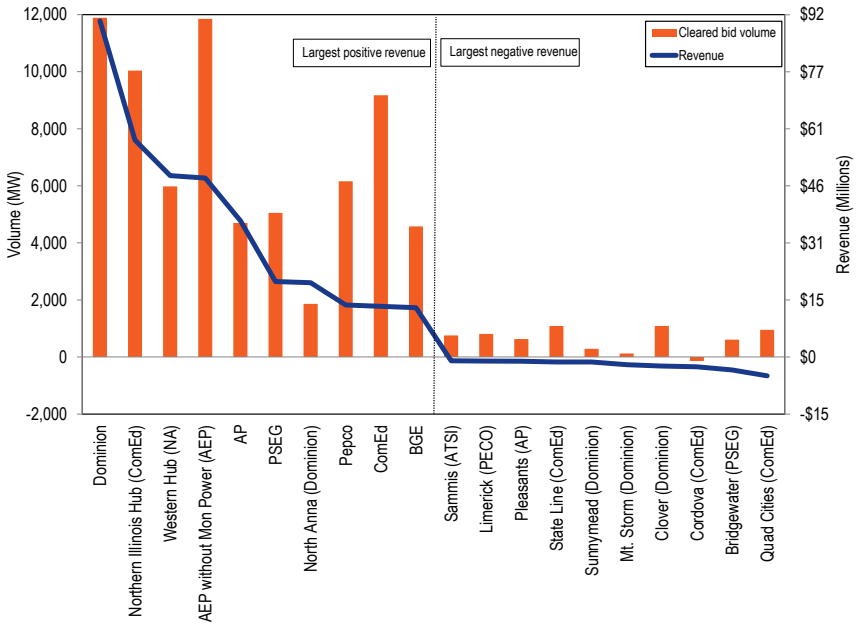


Figure 12-7 Ten largest positive and negative revenue producing FTR sources purchased in the Annual FTR Auction: Planning period 2013 to 2014

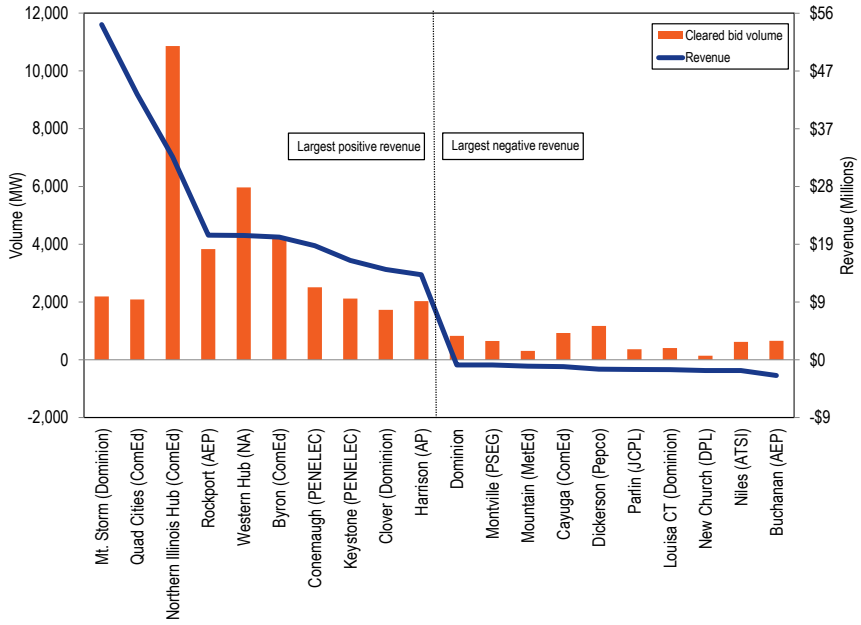


Figure 12-7 summarizes the total revenue associated with all FTRs, regardless of sink, to the FTR sinks that produced the largest positive and negative revenue in the Annual FTR Auction for the 2013 to 2014 planning period. The top ten positive revenue sinks accounted for 45.2 percent of total revenue. The top ten negative revenue sinks accounted for 2.6 percent of total revenue.

Monthly Balance of Planning Period FTR Auction Revenue

Table 12-15 shows Monthly Balance of Planning Period FTR Auction revenue data by trade type, type and class type for January through June 2013. The Monthly Balance of Planning Period FTR Auction netted $23.9 million in revenue, with buyers paying $149.8 million and sellers receiving $124.8 million. For the entire 2012 to 2013 planning period, the Monthly Balance of Planning Period FTR Auctions netted $23.8 million in revenue with buyers paying $127.7 million and sellers receiving $22.1 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 12-15 Monthly Balance of Planning Period FTR Auction revenue: January through June 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
Apr-13	Obligations	Buy bids	($27,848)	$3,384,641	$2,231,023	$5,587,816
		Sell offers	$414,627	$1,703,707	$1,085,350	$3,203,684
	Options	Buy bids	$46,767	$236,939	$92,241	$375,947
		Sell offers	$0	$816,642	$702,628	$1,519,270
May-13	Obligations	Buy bids	$22,637	$2,501,391	$1,418,753	$3,942,781
		Sell offers	$210,649	$1,133,878	$524,793	$1,869,320
	Options	Buy bids	$0	$146,702	$55,903	$202,605
		Sell offers	$441	$739,219	$602,794	$1,342,454
Jun-13	Obligations	Buy bids	$258,896	$12,840,102	$8,210,854	$21,309,852
		Sell offers	$6,203,476	$4,763,316	$2,821,569	$13,788,360
	Options	Buy bids	$1,937	$527,792	$270,176	$799,905
		Sell offers	$0	$4,338,954	$2,862,300	$7,201,254
2012/2013*	Obligations	Buy bids	$67,116	$76,349,386	$43,832,157	$120,248,659
		Sell offers	$4,731,328	$40,127,400	$18,982,130	$63,840,858
	Options	Buy bids	$152,160	$4,512,768	$2,793,076	$7,458,004
		Sell offers	$313,760	$22,240,204	$17,444,010	$39,997,974
	Total		($4,825,812)	$18,494,550	$10,199,092	$23,867,830
2013/2014**	Obligations	Buy bids	$258,896	$12,840,102	$8,210,854	$21,309,852
		Sell offers	$6,203,476	$4,763,316	$2,821,569	$13,788,360
	Options	Buy bids	$1,937	$527,792	$270,176	$799,905
		Sell offers	$0	$4,338,954	$2,862,300	$7,201,254
	Total		($5,942,643)	$4,265,624	$2,797,162	$1,120,143

* Shows Twelve Months; ** Shows one month ended 30-Jun-2013 for 2013/2014

Figure 12-8 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 $46.9 million of the total revenue of $23.9 million paid in the auction, they also comprised 5.7 percent of all FTRs bought in the auction. The top 10 negative revenue producing FTR sinks accounted for -$16.3 million of revenue and constituted 0.2 percent of all FTRs bought in the auction.

Figure 12-8 Ten largest positive and negative revenue producing FTR sinks purchased in the Monthly Balance of Planning Period FTR Auctions: planning period 2012 to 2013

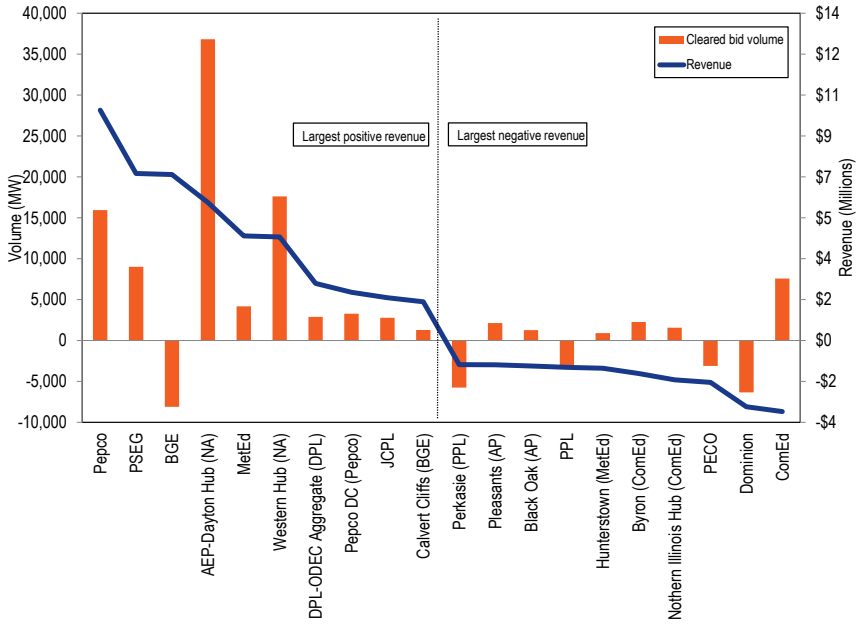
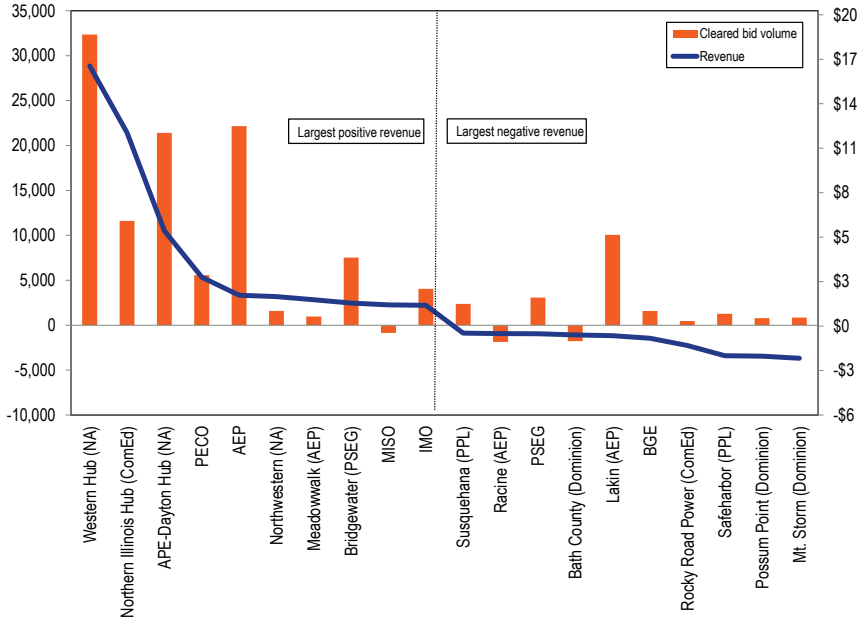


Figure 12-9 summarizes total revenue associated with all FTRs, regardless of sink, from the FTR sources that produced the largest positive and negative revenue from the Monthly Balance of Planning Period FTR Auctions during the 2012 to 2013 planning period. The top 10 positive revenue producing FTR sources accounted for $45.4 million of the total revenue of $23.9 million paid in the auction, they also comprised 7.0 percent of all FTRs bought in

the auction. The top 10 negative revenue producing FTR sinks accounted for -$13.3 million of revenue and constituted 1.1 percent of all FTRs bought in the auction.

Figure 12-9 Ten largest positive and negative revenue producing FTR sources purchased in the Monthly Balance of Planning Period FTR Auctions: planning period 2013 to 2014



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. Figure 12-10 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 23.6 percent of total positive target allocations during the 2012 to 2013 planning period with the PSEG zone accounting for 4.4 percent of all positive target allocations. The top 10 sinks that created liability accounted for 8.7 percent of total negative target allocations with the Western Hub accounting for 1.9 percent of all negative target allocations.

Figure 12-10 Ten largest positive and negative FTR target allocations summed by sink: 2012 to 2013 planning period

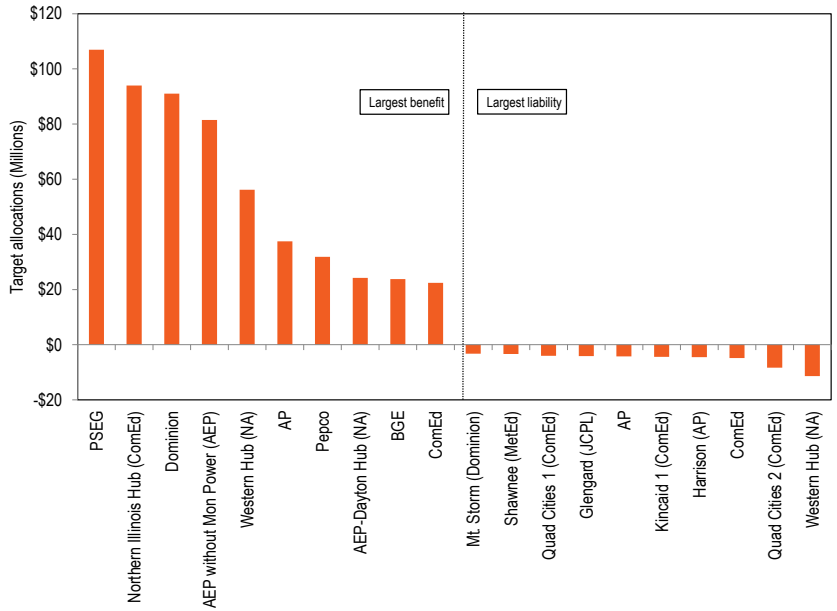
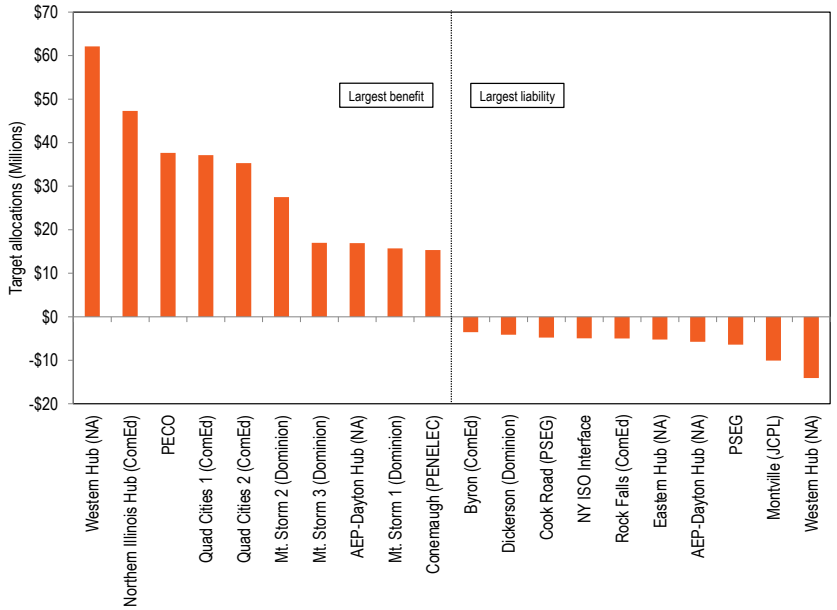


Figure 12-11 shows the ten largest positive and negative FTR target allocations, summed by source, for the 2012 to 2013 planning period. The top 10 sources with a positive target allocation accounted for 12.9 percent of total positive target allocations with the Western Hub accounting for 2.6 percent of total positive target allocations. The top 10 sources with a negative target allocation accounted for 10.7 percent of all negative target allocations, with the Western Hub accounting for 2.3 percent.

Figure 12-11 Ten largest positive and negative FTR target allocations summed by source: 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 in a constrained area 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.[9] 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 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 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.[10] 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

9 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."

10 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 12-16 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.[11] 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.[12,13]

FTRs were paid at 67.8 percent of the target allocation level for the 2012 to 2013 planning period. Congestion revenues are allocated to FTR holders based on FTR target allocations. PJM collected $614.0 million of FTR revenues during the 2012 to 2013 planning period, and $799.6 million during the 2011 to 2012 planning period, a 23.2 percent decrease. For 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 12-16 presents the PJM FTR revenue detail for the 2011 to 2012 and 2012 to 2013 planning period.

Table 12-16 Total annual PJM FTR revenue detail (Dollars (Millions)): Planning periods 2011 to 2012 and 2012 to 2013

Accounting Element	2011/2012	2012/2013
ARR information		
ARR target allocations	$982.9	$587.0
FTR auction revenue	$1,091.8	$653.6
ARR excess	$108.9	$66.7
FTR targets		
FTR target allocations	$992.8	$906.8
Adjustments:		
Adjustments to FTR target allocations	($1.1)	($1.0)
Total FTR targets	$991.7	$905.8
FTR revenues		
ARR excess	$108.9	$66.7
Competing uses	$0.1	$0.1
Congestion		
Net Negative Congestion (enter as negative)	($64.5)	($90.6)
Hourly congestion revenue	$835.5	$668.4
Midwest ISO M2M (credit to PJM minus credit to Midwest ISO)	($79.6)	$41.1
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	$603.4
Excess revenues distributed to other months	$0.0	$0.0
Net Negative Congestion charged to DA Operating Reserves	$0.0	$11.1
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	$614.0
Total congestion credits on bill (includes CEPSW and end-of-year distribution)	$799.6	$614.0
Remaining deficiency	$192.3	$291.8

Unallocated Congestion Charges

When congestion revenue at the end of an hour is negative, target allocations in that hour are set to zero, and there is a congestion liability for that hour. At the end of the month, if excess ARR revenue and excess congestion from other hours and months are not adequate to offset the sum of these hourly differences, Day-Ahead Operating Reserves are charged the unallocated congestion charges so that the total congestion for the month is not less than

11 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)
12 111 FERC ¶ 61,228 (2005).
13 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."

zero. This charge is applied retroactively at the end of the month as additional Day-Ahead Operating Reserves charges and is never credited back to Day-Ahead Operating Reserves in the case of excess congestion. This means that within an hour, the congestion dollars collected from load were less than the congestion dollars paid to generation and there was not enough excess during the month to pay the difference. From 2010 through May 31, 2012, these charges were only made three times, for a total of $7.3 million. However, in the 2012 to 2013 planning period these charges were made in five months for a total of $12.1 million in just one planning period.

Table 12-17 shows the monthly unallocated congestion charges made to Day-Ahead Operating Reserves for the 2012 to 2013 planning period. Months with no unallocated congestion are excluded from the table.[14]

Table 12-17 Unallocated congestion charges: Planning period 2012 to 2013 and 2013 to 2014

Period	Charge
Oct-12	$794,752
Dec-12	$193,429
Jan-13	$5,233,445
Mar-13	$701,303
May-13	$5,210,739
Jun-13	$2,828,660
2012/2013	$12,133,668
2013/2014	$2,828,660

FTR target allocations are based on hourly prices in the Day-Ahead Energy Market for the respective FTR paths and are defined to be the revenue required to compensate FTR holders 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 12-18 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 12-18 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 12-18 Monthly FTR accounting summary (Dollars (Millions)): Planning period 2012 to 2013 and 2013 to 2014

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	93.0%	($4.4)
Jul-12	$71.3	$80.0	88.9%	$71.3	88.9%	($8.8)
Aug-12	$54.1	$55.4	97.1%	$54.1	97.3%	($1.3)
Sep-12	$38.7	$82.5	46.7%	$38.7	46.8%	($43.8)
Oct-12	$24.3	$58.2	41.8%	$25.1	42.7%	($33.1)
Nov-12	$52.0	$59.6	87.2%	$52.0	87.3%	($7.5)
Dec-12	$36.3	$50.1	72.2%	$36.5	72.5%	($13.6)
Jan-13	$63.4	$120.3	53.4%	$68.6	56.5%	($51.7)
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%	($18.2)
Apr-13	$32.7	$47.4	69.4%	$32.7	69.0%	($14.7)
May-13	$41.8	$90.7	46.1%	$47.0	51.9%	($43.7)
Summary for Planning Period 2012 to 2013						
Total	$601.9	$905.8		$614.0	67.8%	($291.8)
Jun-13	$61.3	$82.0	74.7%	$64.1	78.2%	($17.9)
Summary for Planning Period 2013 to 2014						
Total	$61.3	$82.0	74.7%	$64.1	78.2%	($17.9)

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

14 See Section 3, "Operating Reserves" at "Operating Reserve Charges" for the impact of Unallocated Congestion Charges on Operating Reserve rates.

period may change if excess revenue is collected in the remainder of the planning period.

Figure 12-12 FTR payout ratio by month, excluding and including excess revenue distribution: January 2004 through June 2013

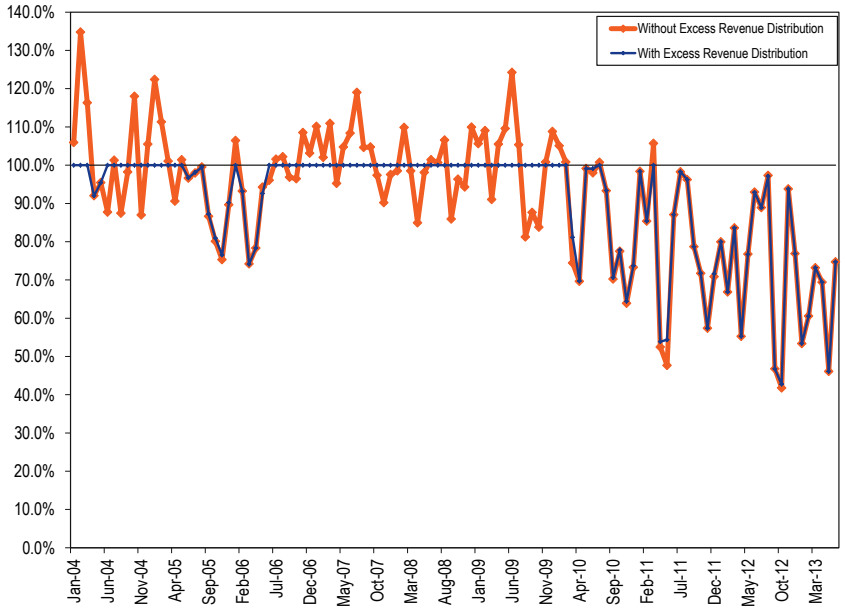


Table 12-19 shows the FTR payout ratio by planning period from the 2003 to 2004 planning period forward. Planning period 2013 to 2014 includes the additional revenue from unallocated congestion charges from Balancing Operating Reserves.

Table 12-19 PJM 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	67.8%
2013/2014	78.2%

*2013/2014 Through 30-Jun-13

FTR Uplift Charge

At the end of the planning period, an uplift charge is applied to FTR holders. This charge is to cover the net of the monthly deficiencies in the target allocations calculated for individual participants. An individual participant's uplift charge is a pro-rata charge, to cover this deficiency, based on their net target allocation with respect to the total net target allocation of all participants with net positive target allocations for the planning period. Participants pay an uplift charge that is a ratio of their share of net positive target allocations to the total net positive target allocations.

The uplift charge is only applied to, and calculated from, members with a net positive target allocation at the end of the planning period. Members with a net negative target allocation have their year-end target allocation set to zero for all uplift calculations. Since participants in the FTR market with net positive target allocations are paying the uplift charge to fully fund FTRs, their payout ratio cannot be 100 percent. The end of planning period payout ratio is calculated as the participant's target allocations minus the uplift charge applied to them divided by their target allocations. The calculations of uplift are structured so that, at the end of the planning period, every participant in the FTR market with a positive net target allocation receives payments based on the same payout ratio. At the end of the planning period and the end of a given month no payout ratio is actually applied to a participant's

target allocations. The payout ratio is simply used as a reporting mechanism to demonstrate the amount of revenue available to pay target allocations and represent the percentage of target allocations a participant with a net positive portfolio has been paid for the planning period. However, this same calculation is not accurate when calculating a single month's payout ratio as currently reported, where the calculation of available revenue is not the same.

The total planning period target allocation deficiency is the sum of the monthly deficiencies throughout the planning period. The monthly deficiency is the difference in the net target allocation of all participants and the total revenue collected for that month. The total revenue paid to FTR holders is based on the hourly congestion revenue collected, which includes hourly M2M, wheel payments and unallocated congestion credits.

Table 12-20 provides a demonstration of how the FTR uplift charge is calculated. In this example it is important to note that the sum of the net positive target allocations is $32 and the total monthly deficiency is $10. The uplift charge is structured so that those with higher target allocations pay more of the deficit, which ultimately impacts their net payout. Also, in this example, and in the PJM settlement process, the monthly payout ratio varies for all participants, but the uplift charge is structured so that once the uplift charge is applied the end of planning period payout ratio is the same for all participants.

For the 2012 to 2013 planning period, the total deficiency was $291.8 million. The top ten participants with the highest target allocations paid 53.6 percent of the total deficiency for the planning period. All of the uplift money is collected from individual participants, and distributed so that every participant experiences the same payout ratio. This means that some participants subsidize others and receive less payout from their FTRs after the uplift is applied, while others receive a subsidy and get a higher payout after the uplift is applied. In this example participants 1 and 5 are paid less after the uplift charge is applied, while participants 3 and 4 are paid more.

Table 12-20 End of planning period FTR uplift charge example

Participant	Net Target Allocation	Total Monthly Payment	Monthly Deficiency	Uplift Charge	Net Payout	Monthly Payout Ratio	EOPP Payout Ratio
1	$10.00	$8.00	$2.00	$3.13	$6.88	80.0%	68.8%
2	-$4.00	$0.00	$0.00	$0.00	-$4.00	100.0%	100.0%
3	$15.00	$10.00	$5.00	$4.69	$10.31	66.7%	68.8%
4	$3.00	$1.00	$2.00	$0.94	$2.06	33.3%	68.8%
5	$4.00	$3.00	$1.00	$1.25	$2.75	75.0%	68.8%
Total	$28.00	$22.00	$10.00	$10.00	$18.00		

Revenue Adequacy Issues and Solutions

PJM Reported Payout Ratio

The payout ratios shown above in Table 12-19 reflect the PJM reported payout ratios for each month of 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 of the month. This does not correctly measure the payout ratio actually received by positive target allocation FTR holders in the month, but provides an estimate of the ratio based on the approach to end of planning period calculations, including cross subsidies.

The payout ratio is intended to measure the proportion of the target allocation received by the holders of FTRs with positive target allocations in a month. In fact, the actual monthly 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.[15] Also included in this revenue is any M2M charge or credit for the month and any excess ARR revenues for the month. The revenue and net target allocations are then summed over the month to calculate the monthly payout ratio. There is no payout ratio applied on a monthly basis, each participant receives a different share of the available revenue based on availability, it is simply used as a reporting mechanism. At the end of a given month, a participant's FTR payments are a proportion of the congestion credits collected, based on the participant's share of the total monthly target

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

allocation. The payout ratio is only used and calculated at the end of the planning period after uplift is applied to each participant. The actual monthly 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, reported on a monthly basis, is greater than reported by PJM.

Table 12-21 shows the PJM reported and actual monthly payout ratio for the 2012 to 2013 planning period. In September the PJM reported payout ratio is 8.8 percentage points below the actual payout ratio. On a month to month basis, the payout ratio currently reported by PJM does not take into account all sources of revenue available to pay FTR holders. This provides a slightly overstated level of underfunding on a monthly basis.

Table 12-21 PJM Reported and Actual Monthly Payout Ratios: Planning period 2012 to 2013

	Reported Monthly Payout Ratio	Actual Monthly 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%
Apr-13	69.0%	70.8%
May-13	51.9%	54.2%
Jun-13	78.2%	79.4%

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 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.

Elimination of portfolio netting should also be applied to the end of planning period FTR uplift calculation. With this approach, negative target allocations would not offset positive target allocations at the end of the planning period when allocating uplift. The FTR uplift charge would be based on participants' share of the total positive target allocations paid for the planning period.

Table 12-22 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 12-22 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 12-23 shows the total value for the 2012 to 2013 and first month of the 2013 to 2014 planning periods 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 monthly 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 for the 2012 to 2013 planning period would have been 84.6 percent instead of the reported 67.8 percent.

Table 12-23 Monthly positive and negative target allocations and payout ratios with and without hourly netting: Planning period 2012 to 2013 and 2013 to 2014

	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)	$58,501,718	93.0%	96.3%
Jul-12	$89,179,225	($9,034,200)	$173,602,611	($93,421,963)	$71,290,265	89.0%	94.9%
Aug-12	$60,694,118	($5,115,960)	$111,642,193	($55,976,928)	$54,162,229	97.5%	98.7%
Sep-12	$99,154,010	($16,477,176)	$179,647,915	($96,844,326)	$38,826,756	47.0%	75.5%
Oct-12	$68,051,707	($9,827,426)	$137,698,279	($79,454,756)	$25,103,801	43.1%	75.9%
Nov-12	$66,233,739	($6,557,217)	$124,142,020	($64,424,379)	$52,074,746	87.3%	93.8%
Dec-12	$54,866,078	($4,610,245)	$110,328,974	($59,848,711)	$36,538,590	72.7%	87.4%
Jan-13	$129,107,968	($8,672,497)	$233,783,161	($113,347,680)	$68,687,855	57.0%	77.9%
Feb-13	$135,713,011	($7,613,077)	$259,657,461	($131,557,526)	$77,178,125	60.2%	80.4%
Mar-13	$74,434,140	($3,760,700)	$146,552,085	($75,878,638)	$52,441,084	74.2%	87.6%
Apr-13	$50,520,958	($3,090,289)	$108,760,047	($61,325,460)	$32,702,818	68.9%	86.5%
May-13	$95,366,498	($4,678,790)	$190,798,195	($100,110,478)	$47,029,109	51.9%	77.1%
Jun-13	$86,787,810	($4,822,658)	$164,066,220	($82,101,063)	$64,080,191	78.2%	89.1%
2012/2013 Total	$992,878,752	($86,061,137)	$1,897,830,880	($990,471,801)	$614,537,096	67.8%	84.6%
2013/2014 Total	$86,787,810	($4,822,658)	$164,066,220	($82,101,063)	$64,080,191	78.2%	89.1%

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 12-24 provides an example of how the counter flow adjustment method would impact a two FTR system. In this example there is $15 of total congestion revenue available, corresponding to a reported payout ratio of 75 percent and a monthly actual payout ratio of 87.5 percent. In the example, the profit before and after underfunding can be seen in addition to the profit after underfunding with the counter flow adjustment made. As illustrated, a counter flow FTR's profit does not change when underfunding is applied, whereas a prevailing flow FTR's profit decreases. Applying the counter flow adjustment distributes the underfunding penalty evenly to both prevailing and counter flow FTR holders.

Table 12-24 Example implementation of counter flow adjustment method

	Prevailing A-B 10MW	Counter C-D 10MW
Auction Cost	$50.00	($30.00)
Target Allocation	$40.00	($20.00)
Payout	$30.00	($20.00)
Profit without underfunding	($10.00)	$10.00
Profit after underfunding	($20.00)	$10.00
Payout for Positive TA	$35.00	($20.00)
Profit for Positive TA	($15.00)	$10.00
Payout after CF Adjustment	$36.67	($21.67)
Profit after CF Adjustment	($13.33)	$8.33
Profit Difference	$1.67	($1.67)

in revenue available to fund positive target allocations for the 2012 to 2013 planning period.

The result of removing portfolio netting and applying a payout ratio to counter flow FTRs would increase the calculated payout ratio for the 2012 to 2013 planning period from the reported 67.8 percent to 88.6 percent.

Figure 12-13 shows the FTR surplus, collected day-ahead, balancing and total congestion payments from January 2005 through June 2013.

Table 12-25 Counter flow FTR payout ratio adjustment impacts

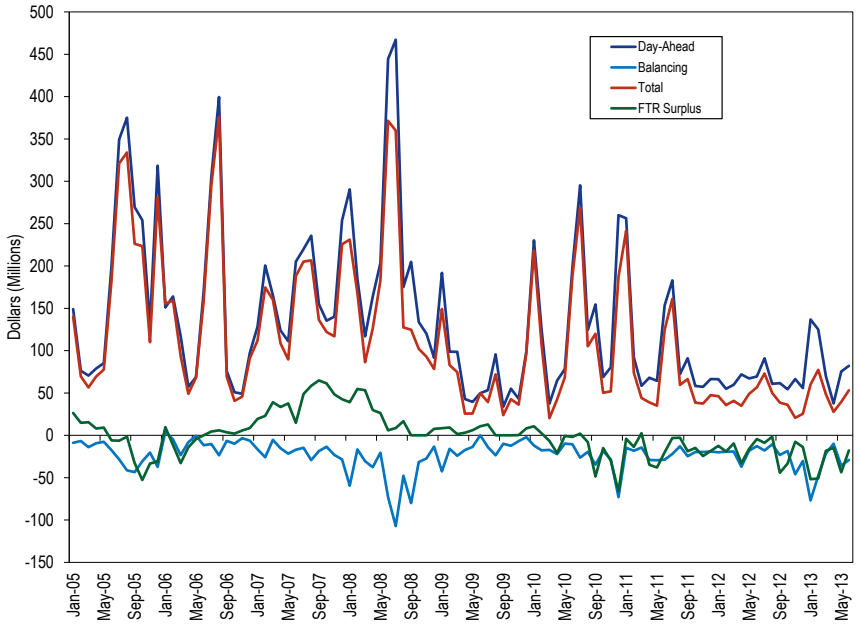
	Positive Target Allocations	Negative Target Allocations	Total Target Allocations	Total Congestion Revenue	Reported Payout Ratio*	Total Revenue Available	Adjusted Counterflow Payout Ratio	Adjusted Counter Flow Revenue Available
Jun-12	$121,217,938	($58,280,956)	$62,936,981	$58,501,718	93.0%	$116,782,674	97.1%	$117,691,035
Jul-12	$173,602,611	($93,421,963)	$80,180,649	$71,290,265	88.9%	$164,712,228	96.1%	$166,783,011
Aug-12	$111,642,193	($55,976,928)	$55,665,265	$54,162,229	97.3%	$110,139,157	99.0%	$110,479,244
Sep-12	$179,647,915	($96,844,326)	$82,803,589	$38,826,756	46.9%	$135,671,082	82.3%	$147,867,390
Oct-12	$137,698,279	($79,454,756)	$58,243,523	$25,103,801	43.1%	$104,558,557	82.9%	$114,167,539
Nov-12	$124,142,020	($64,424,379)	$59,717,640	$52,074,746	87.2%	$116,499,125	95.3%	$118,360,564
Dec-12	$110,328,974	($59,848,711)	$50,480,263	$36,538,590	72.4%	$96,387,301	90.7%	$100,020,037
Jan-13	$233,783,161	($113,347,680)	$120,435,482	$68,687,855	57.0%	$182,035,534	83.4%	$194,918,106
Feb-13	$259,657,461	($131,557,526)	$128,099,935	$77,178,125	60.2%	$208,735,651	85.4%	$221,802,099
Mar-13	$146,552,085	($75,878,638)	$70,673,447	$52,441,084	74.2%	$128,319,722	90.8%	$133,050,166
Apr-13	$108,760,047	($61,325,460)	$47,434,587	$32,702,818	68.9%	$94,028,278	90.2%	$98,080,581
May-13	$190,798,195	($100,110,478)	$90,687,717	$47,029,109	51.9%	$147,139,587	82.9%	$158,223,288
Jun-13	$164,066,220	($82,101,063)	$81,965,157	$64,080,191	78.2%	$146,181,254	91.9%	$150,785,406
Total 2012/2013	$1,897,830,880	($990,471,801)	$907,359,079	$614,537,096	67.7%	$1,605,008,896	88.6%	$1,681,443,058
Total 2013/2014	$164,066,220	($82,101,063)	$81,965,157	$64,080,191	78.2%	$146,181,254	91.9%	$150,785,406

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

Table 12-25 shows the monthly positive, negative and total target allocations.[16] Table 12-25 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 $76.4 million (26.1 percent of underfunding)

16 Reported payout ratio may differ between Table 12-23 and Table 12-25 due to rounding differences when netting target allocations and considering each FTR individually.

Figure 12-13 FTR Surplus and the collected Day-Ahead, Balancing and Total congestion: January 2005 through June 2013



Up-to-Congestion Transaction FTR Forfeitures

Currently there is no FTR forfeiture rule implemented for Up-to-Congestion Transactions (UTCs). A rule that would apply the FTR forfeiture rule to UTCs is pending at the Commission.[17] The intent of an FTR forfeiture rule applied to UTCs should be the same as with INCs and DECs, to prevent the use of virtual bids to increase Day-Ahead congestion on an FTR path. The proposed penalty should be the same as it is for the INC and DEC rule, namely the forfeiture of any profits due to an FTR found to be influenced by a UTC.

The rule submitted by PJM and scheduled for implementation will not appropriately address the impact of UTCs on FTRs and will not be consistent with the application of the current forfeiture rule.

17 *See* FERC Docket No. ER13-1654.

The appropriate and consistent method for determining whether a UTC is eligible for forfeiture would also take the net of the UTC into consideration. However, in the case of a UTC that does not span a constraint, the net of the UTC would be used to determine if the UTC was a net injection (INC) or withdrawal (DEC) on the system. If a UTC does span a constraint the net of the UTC is calculated and it is treated as both an injection and a withdrawal. After the net effect of the UTC is calculated the net injection or withdrawal of the UTC is treated the same way an INC or DEC is treated in the current implementation of the FTR forfeiture rule.

Table 12-25 shows the amount of FTR profit that would have been forfeited in the first six months of 2013 under the PJM method and the appropriate method.

Table 12-26 Up-to-Congestion Transaction FTR forfeiture totals for the two proposed methods

Month	IMM	PJM
Jan-13	$198,025	$24,070
Feb-13	$527,000	$59,241
Mar-13	$285,527	$9,000
Apr-13	$34,598	$359
May-13	$609,518	$21,845
Jun-13	$267,079	$7,011
Total	$1,921,747	$121,525

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.[18] 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.[19]

18 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.

19 For a more complete explanation, see the *2012 State of the Market Report for PJM*, Volume II, Section 12, "FTRs."

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 2013 to 2014 planning period, all eligible market participants were allocated ARRs.

Table 12-27 shows the top 10 principal binding transmission constraints that limited the 2013 to 2014 Annual ARR Allocation. For the 2013 to 2014 ARR Stage 1A allocation, PJM was required to increase capability limits for several facilities in order to make the ARR allocation feasible.[20]

Table 12-27 Top 10 principal binding transmission constraints limiting the Annual ARR Allocation: Planning period 2013 to 2014

Constraint	Type	Control Zone
Cordova - Nelson	Flowgate	MISO
Silver Lake - Cherry Valley	Line	COMED
Electric Junction - Nelson	Line	COMED
Oak Grove - Galesburg	Flowgate	MISO
Waukegan-Zion	Line	COMED
Zion - Lakeview	Line	COMED
Lakeview	Transformer	MISO
Zion	Transformer	COMED
Braidwood - East Frankfort	Line	COMED
Greystone - West Wharton	Line	JCPL

ARR Reassignment for Retail Load Switching

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 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 ARRs for the receiving LSE compared to the total value held by the original ARR holder.

There were 52,825 MW of ARRs associated with approximately $498,800 of revenue that were reassigned in the 2012 to 2013 planning period. There were 41,770 MW of ARRs associated with approximately $758,000 of revenue that were reassigned for the full twelve months of the 2011 to 2012 planning period.

Table 12-28 summarizes ARR MW and associated revenue automatically reassigned for network load in each control zone where changes occurred between June 2011 and June 2013.

20 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.

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

Table 12-28 ARRs and ARR revenue automatically reassigned for network load changes by control zone: June 1, 2011, through June 30, 2013

	ARRs Reassigned (MW-day)		ARR Revenue Reassigned [Dollars (Thousands) per MW-day]	
Control Zone	2012/2013 (12 months)	2013/2014 (1 month)*	2012/2013 (12 months)	2013/2014 (1 month)*
AECO	581	219	$3.0	$0.7
AEP	4,656	893	$58.9	$4.9
AP	3,518	543	$84.1	$11.9
ATSI	5,314	1,355	$8.3	$1.1
BGE	3,203	758	$37.3	$7.8
ComEd	11,824	919	$170.7	$7.8
DAY	589	74	$0.9	$0.1
DEOK	2,979	801	$1.6	$0.7
DLCO	2,708	2,619	$19.1	$6.0
DPL	1,989	469	$11.5	$3.7
Dominion	0	5	$0.0	$0.1
EKPC	NA	0	NA	$0.0
JCPL	1,373	414	$5.6	$1.2
Met-Ed	1,107	220	$8.6	$1.7
PECO	3,416	281	$22.7	$2.0
PENELEC	920	208	$8.3	$2.3
PPL	3,198	799	$20.5	$2.8
PSEG	2,312	613	$16.5	$5.0
Pepco	3,073	660	$21.4	$2.4
RECO	67	23	$0.0	$0.0
Total	52,825	11,871	$498.8	$62.2

* Through 30-Jun-2013

Incremental ARRs (IARRs) for RTEP Upgrades

Table 12-29 lists the incremental ARR allocation volume for the current and previous planning periods from the 2008 to 2009 planning period through the 2013 to 2014 planning period.

Table 12-29 Incremental ARR allocation volume: Planning periods 2008 to 2009 through 2013 to 2014

Planning Period	Requested Count	Bid and Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
2008/2009	15	891	891	100%	0	0%
2009/2010	14	531	531	100%	0	0%
2010/2011	14	531	531	100%	0	0%
2011/2012	15	595	595	100%	0	0%
2012/2013	15	687	687	100%	0	0%
2013/2014	17	1087	1087	100%	0	0%

Table 12-30 lists the three RTEP upgrade projects that were allocated a total of 678.2 MW of IARRs.

Table 12-30 IARRs allocated for 2013 to 2014 Annual ARR Allocation for RTEP upgrades[22]

		IARR Parameters		
Project #	Project Description	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.

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

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 12-31 shows the Residual ARRs automatically allocated to eligible participants, along with the target allocations from the effective month.

Table 12-31 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
Apr-13	5,452.1	1,608.9	29.5%	$325,662
May-13	6,054.7	1,647.4	27.2%	$282,425
Jun-13	10,864.1	1,272.7	11.7%	$667,291

Market Performance

Volume

Table 12-32 shows the volume of ARR allocations for each round of the 2012 to 2013 and 2013 to 2014 planning periods.

Table 12-32 Annual ARR Allocation volume: planning periods 2012 to 2013 and 2013 to 2014

Planning Period	Stage	Round	Requested Count	Requested Volume (MW)	Cleared Volume (MW)	Cleared Volume	Uncleared Volume (MW)	Uncleared Volume
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	88.0%
		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	81.8%
	Total		39,148	164,770	97,986	59.5%	66,784	40.5%
2013/2014	1A	0	18,022	67,861	67,861	100.0%	0	0.0%
	1B	1	14,227	32,679	15,782	48.3%	16,897	51.7%
	2	2	5,476	22,096	3,519	15.9%	18,577	84.1%
		3	4,128	22,480	3,200	14.2%	19,280	85.8%
		4	3,335	22,348	2,612	11.7%	19,736	88.3%
		Total	12,939	66,924	9,331	13.9%	57,593	86.1%
	Total		45,188	167,464	92,974	55.5%	74,490	44.5%

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 12-33 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. In addition, the reason for infeasibility is provided, whether it is an increase in network load, or due to transmission outages in the simultaneous feasibility test.

Table 12-33 Constraints with capacity increases due to Stage 1A infeasibility for the 2013 to 2014 ARR Allocation

Constraint	Contingency	Type	Zone	MW Increase	Reason
Silver Lake - Cherry Valley	Nelson - Electric Junction	Line	COMED	251	Load
Cordova - Nelson	Nelson	Flowgate	MISO	215	Load
Electric Junction - Nelson	Nelson - Electric Junction	Line	COMED	202	Load
Oak Grove - Galesburg	Nelson - Electric Junction	Flowgate	MISO	151	Load
Silver Lake - Cherry Valley	BASE	Line	COMED	139	Load
Waukegan - Zion	BASE	Line	COMED	129	Load
Zion	Cherry Valley - Silver Lake	Transformer	COMED	121	Load
Zion - Lakeview	Cherry Valley - Silver Lake	Line	COMED	121	Load
Lakeview	Cherry Valley - Silver Lake	Transformer	MISO	121	Load
Electric Junction - Nelson	BASE	Line	COMED	113	Load
Waukegan - Zion	Cherry Valley - Silver Lake	Line	COMED	106	Load
Roseland - Whippany	Roseland - Readington	Line	PSEG	103	Outages
Roseland - Whippany	BASE	Line	PSEG	93	Outages
Kenney - Mount Olive	New Church - Piney Grove	Line	DPL	70	Outages
Prairie State - W. Mt. Vernon	St Francis - Lutesville	Flowgate	MISO	60	Load
Kenney - Stockton	New Church - Piney Grove	Line	DPL	59	Outages
Mount Olive - Piney	New Church - Piney Grove	Line	DPL	54	Outages
Belvidere - Woodstock	Cherry Valley - Silver Lake	Line	COMED	51	Load
Belvidere - Chrysler Corp.	Cherry Valley - Silver Lake	Line	COMED	51	Load
Dixon - Stillman Valley	Nelson - Electric Junction	Line	COMED	45	Load
Pleasant Valley - Belvidere 2	Cherry Valley - Silver Lake	Line	COMED	41	Load
McGirr Road - Steward	Nelson - Electric Junction	Line	COMED	37	Load
Athenia - Saddlebrook	BASE	Line	PSEG	24	Outages
Mazon - Mazon	Kickapoo Creek - Lasalle	Line	COMED	16	Load
Pleasant Valley - Belvidere 1	Cherry Valley - Silver Lake	Line	COMED	13	Load

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 a projected $626.7 million in credits from the FTR auctions during the 2012 to 2013 planning period, with a projected average hourly ARR credit of $0.66 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 $1.06 per MW.

Table 12-34 lists projected ARR target allocations from the Annual ARR Allocation, 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 planning periods.

Table 12-34 Projected ARR revenue adequacy (Dollars (Millions)): Planning periods 2012 to 2013 and 2013 to 2014

	2012/2013	2013/2014
Total FTR auction net revenue	$626.7	$559.5
Annual FTR Auction net revenue	$602.9	$558.4
Monthly Balance of Planning Period FTR Auction net revenue*	$23.9	$1.1
ARR target allocations	$570.5	$502.4
ARR credits	$570.5	$502.4
Surplus auction revenue	$56.2	$57.1
ARR payout ratio	100%	100%
FTR payout ratio*	67.8%	74.7%

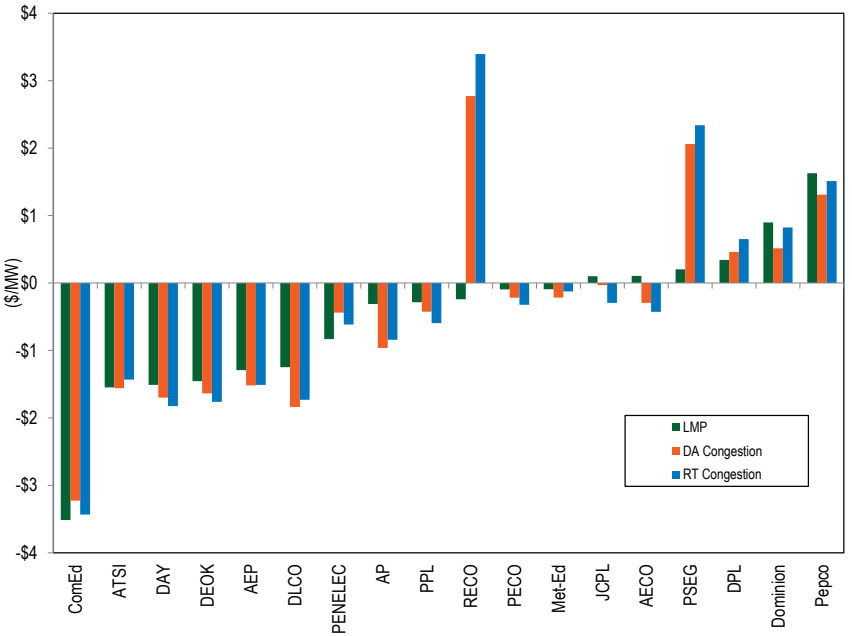
* Shows twelve months for 2012/2013 and one month for 2013/2014.

ARR and FTR Revenue and Congestion

FTR Prices and Zonal Price Differences

As an illustration of the relationship between FTRs and congestion, Figure 12-14 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 12-14 Annual FTR Auction prices vs. average day-ahead and real-time congestion for all control zones relative to the Western Hub: 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 92.6 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 12-35. 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 67.8 percent of the target allocation for 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 12-35 through Table 12-37, 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 12-35 ARR and self-scheduled FTR congestion offset (in millions) by control zone: 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	($0.8)	87.5%
AEP	$25.3	$57.1	$82.4	$37.7	$71.9	>100%
APS	$40.6	$23.5	$64.1	$7.1	$68.2	>100%
ATSI	$4.1	$0.2	$4.3	($4.0)	$8.5	>100%
BGE	$30.3	$0.7	$31.0	$7.9	$23.4	>100%
ComEd	$101.8	$0.0	$101.8	($45.3)	$147.1	>100%
DAY	$1.5	$1.7	$3.2	($2.9)	$7.0	>100%
DEOK	$1.1	$0.1	$1.3	($5.1)	$6.5	>100%
DLCO	$5.9	$0.2	$6.1	($0.4)	$6.6	>100%
Dominion	$6.7	$56.5	$63.2	$13.9	$76.2	>100%
DPL	$11.4	$1.3	$12.8	$27.3	($13.9)	46.7%
External	$5.5	$0.5	$6.0	$2.5	$3.7	>100%
JCPL	$9.0	$0.2	$9.2	$9.7	($0.4)	95.0%
Met-Ed	$8.7	$0.1	$8.9	$5.1	$3.8	>100%
PECO	$16.9	$1.8	$18.8	$16.7	$2.9	>100%
PENELEC	$6.9	$4.9	$11.8	$6.4	$7.6	>100%
Pepco	$24.8	$1.6	$26.4	$25.1	$2.0	>100%
PPL	$18.8	$1.1	$20.0	$6.3	$14.2	>100%
PSEG	$26.1	$8.7	$34.8	($13.9)	$52.8	>100%
RECO	$0.0	$0.0	$0.0	$1.3	($1.3)	0.1%
Total	$351.4	$160.5	$511.9	$102.3	$505.3	>100%

Effectiveness of ARRs and FTRs as an Offset to Congestion

Table 12-36 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

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.

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 67.8 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.[25] The last column shows the difference between the total ARR and FTR offset and the congestion cost for each control zone.

Table 12-36 ARR and FTR congestion offset (in millions) by control zone: 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	($1.1)	$6.5	($1.7)	$2.9	($4.5)	0.0%
AEP	$104.1	$99.6	$123.0	$80.7	$96.5	($15.8)	83.6%
APS	$76.3	$28.0	$40.0	$64.3	$80.4	($16.1)	80.0%
ATSI	$4.3	$13.6	($0.9)	$18.8	($0.8)	$19.6	>100%
BGE	$31.6	$32.2	$43.5	$20.4	$27.8	($7.4)	73.3%
ComEd	$121.5	$86.0	$81.4	$126.0	$155.7	($29.7)	80.9%
DAY	$3.8	$6.0	$5.4	$4.5	$4.4	$0.0	>100%
DEOK	$1.4	$6.1	$4.1	$3.4	$0.5	$3.0	>100%
DLCO	$7.2	$0.5	$7.4	$0.4	$4.3	($3.9)	8.3%
Dominion	$79.3	$78.1	$109.9	$47.5	$75.8	($28.2)	62.7%
DPL	$12.3	$21.2	$19.8	$13.6	$16.8	($3.2)	80.9%
External	$6.7	($1.3)	$1.5	$3.9	($27.5)	$31.3	>100%
JCPL	$9.3	$24.3	$22.0	$11.6	$13.1	($1.5)	88.2%
Met-Ed	$9.1	$7.1	$16.0	$0.2	$2.3	($2.1)	9.0%
PECO	$20.1	$11.5	$17.5	$14.2	$1.2	$13.0	>100%
PENELEC	$11.8	$28.6	$30.3	$10.1	$39.6	($29.5)	25.5%
Pepco	$27.1	$44.6	$83.4	($11.6)	$37.6	($49.2)	0.0%
PPL	$21.5	$5.4	$9.4	$17.4	$13.2	$4.2	>100%
PSEG	$24.0	$117.6	$35.7	$105.9	$27.1	$78.8	>100%
RECO	$0.0	$2.1	($1.8)	$3.9	$4.9	($1.1)	78.1%
Total	$577.2	$610.3	$654.1	$533.4	$575.9	($42.5)	92.6%

Table 12-37 shows the total offset due to ARRs and FTRs for the entire 2011 to 2012 and 2012 to 2013 planning periods.

Table 12-37 ARR and FTR congestion hedging (in millions): Planning periods 2011 to 2012 and 2012 to 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	$577.2	$610.3	$654.1	$533.4	$575.9	($42.5)	92.6%

25 The total zonal congestion numbers were calculated as of July 10, 2013 and may change as a result of continued PJM billing updates.

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.