A Closer Look at Congestion and FTRs in PJM

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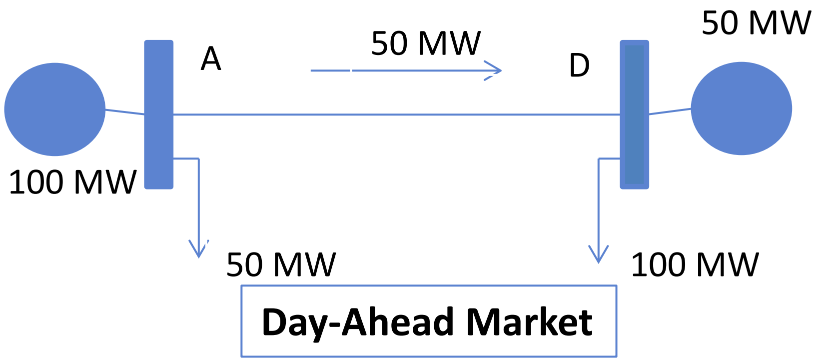
The Double Payment Confusion

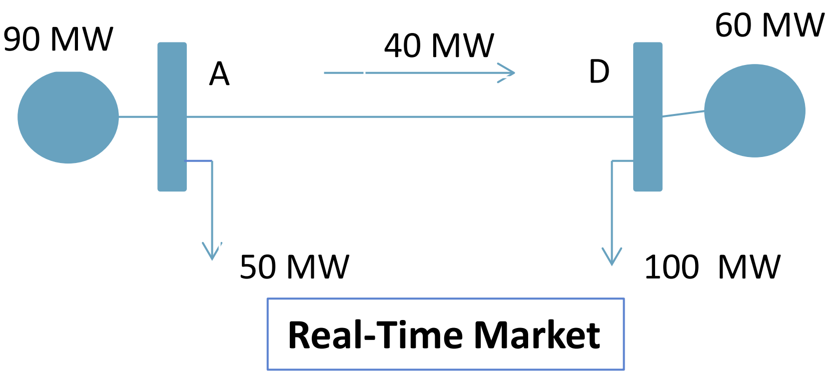
- The PJM IMM has stated that excluding balancing congestion from Financial Transmission Right (FTR) settlements will result in double payment for congestion by load[1]
- This claim appears to assume that load does not own any FTRs or ARRs which is inconsistent with the PJM Tariff and the reality of the PJM market
- Once load ownership of FTRs is factored in, there is **no double payment**
- While load may not own all FTRs, non LSE owners of FTRs do not receive FTRs for free but must purchase them in FTR auctions with auction revenues flowing to load through Auction Revenue Rights (ARRs) – so once again there should be **no double payment**

1. FTR and Congestion Discussion, Howard Haas, Monitoring Analytics, PJM FTRSTF, Aug 4, 2014
http://www.pjm.com/~/media/committees-groups/task-forces/ftrstf/20140804/20140804-imm-ftr-vs-congestion-discussion.ashx
Similar statements have been made in the IMM's comments in EL13-47 and in recent State of the Market Reports.
For example, 2014 Quarterly State of the Market Report: Jan through June at p 375 states *"To eliminate balancing congestion from the FTR revenue calculation would require load to pay twice for congestion."*
http://monitoringanalytics.com/reports/PJM_State_of_the_Market/2014/2014q2-som-pjm-sec13.pdf

The IMM's Example

- The following example is based on the IMM's Aug 4 presentation to the FTRSTF[1]
- There are two locations, Bus A and Bus D with 50 MW transmission capacity between them Day-Ahead (DA) – this is reduced to 40 MW in Real-Time (RT)
- 150 MW of load is split between 50 MW for LSE 1 at Bus A and 100 MW for LSE 2 at Bus B – load is unchanged between DA and RT
- CLMP is 50 \$/MWh at Bus A and 100 \$/MWh at Bus B in both DA and RT
- DA Generation is 100 MW at Bus A and 50 MW at Bus B, RT Generation is 90 MW at Bus A and 60 MW at Bus B – there are Gen Deviations of -10 MW and 10 MW at A and B





1. FTR and Congestion Discussion, Howard Haas, Monitoring Analytics, PJM FTRSTF, Aug 4, 2014 http://www.pjm.com/~/media/committees-groups/task-forces/ftrstf/20140804/20140804-imm-ftr-vs-congestion-discussion.ashx

Day-Ahead and Balancing Congestion

Bus	DA CLMP	DA MW GEN	DA MW Load (Total)	DA MW Load (LSE 1)	DA MW Load (LSE 2)	Gen Credit	Load Charges	LSE 1 Charges	LSE 2 Charges	Day-Ahead Congestion
A	$ 50	100	50	50	0	$ 5,000	$ 2,500	$ 2,500	$ 0	$(2,500)
D	$ 100	50	100	0	100	$ 5,000	$ 10,000	$ 0	$ 10,000	$ 5,000
Total		150	150	50	100	$ 10,000	$ 12,500	$ 2,500	$ 10,000	$ 2,500
Bus	**RT CLMP**	**RT MW GEN**	**RT MW Load (Total)**	**RT MW Load (LSE 1)**	**RT MW Load (LSE 2)**	**Gen Credit**	**Load Charges**	**LSE 1 Charges**	**LSE 2 Charges**	**"Total" Congestion**
A	$ 50	90	50	50	0	$ 4,500	$ 2,500	$ 2,500	$ 0	$(2,000)
D	$ 100	60	100	0	100	$ 6,000	$ 10,000	$ 0	$ 10,000	$ 4,000
Total		150	150	50	100	$ 10,500	$ 12,500	$ 2,500	$ 10,000	$ 2,000
Bus	**RT CLMP**	**Gen Dev**	**Total Load Dev**	**LSE1 Dev**	**LSE 2 Dev**	**Gen Credit**	**Load Charges**	**LSE 1 Charges**	**LSE 2 Charges**	**Balancing Congestion**
A	$ 50	-10	0	0	0	$(500)	$ 0	$ 0	$ 0	$ 500
D	$ 100	10	0	0	0	$ 1,000	$ 0	$ 0	$ 0	$(1,000)
Total Deviation		0	0	0	0	$ 500	$ 0	$ 0	$ 0	$(500)
Total DA + Balancing										$ 2,000

- **Load is charged $2,500 for congestion based on its schedule in the DA Market** [1]
- Load is further split between LSE 1 at Bus A and LSE 2 at Bus D
- LSE 2 is exposed to congestion but LSE 1 is not, 50 MW FTRs are held by LSE 2

1. FTR and Congestion Discussion, Howard Haas, Monitoring Analytics, PJM FTRSTF, Aug 4, 2014 (see slides 12 and 19 that suggest load is charged $2,000 for congestion) http://www.pjm.com/~/media/committees-groups/task-forces/ftrstf/20140804/20140804-imm-ftr-vs-congestion-discussion.ashx

FTRs, Balancing Congestion and Net Load Payments

LSE Net Payments (DA, FTR, Balancing Congestion)

Balancing Congestion Allocation	LSE 1 Charges	LSE 2 Charges	Total LSE Charges	LSE 1 FTR Payments	LSE 2 FTR Payments	LSE 1 Balancing Congestion	LSE 2 Balancing Congestion	LSE 1 Net Payments	LSE 2 Net Payments	LSE Net Payments
To FTRs (current approach)	$ 0	$ 10,000	$ 10,000	$ 0.00	$ 2,000.00	$ 0	$ 0	$ 0	$ 8,000	$ 8,000
LSEs pro-rata	$ 0	$ 10,000	$ 10,000	$ 0.00	$ 2,500.00	$ 133	$ 367	$ 133	$ 7,867	$ 8,000
LSEs targeted	$ 0	$ 10,000	$ 10,000	$ 0.00	$ 2,500.00	$ 0	$ 500	$ 0	$ 8,000	$ 8,000
Transmission Owners (NYISO)	$ 0	$ 10,000	$ 10,000	$ 0.00	$ 2,500.00	$ 0	$ 0	$ 0	$ 7,500	$ 7,500

- Once Load ownership of FTRs is included, LSE net payments (DA, FTR and balancing congestion) either remain the same or decrease under alternative allocations of balancing congestion
- Any balancing congestion payments by load are offset by an improved FTR hedge against the LSE’s actual congestion exposure which occurs in the DA Market
- Alternative allocations of balancing congestion (e.g., to Transmission Owners as in NYISO) can further reduce load charges from congestion
- In all scenarios, there is **<u>no double payment</u>**

Load, ARRs and FTRs

- PJM Auctions the entire capacity of its transmission system in Annual FTR Auction
- LSEs are allocated Auction Revenue Rights (ARRs) that can be directly converted to FTRs
- Annual FTR auction revenues are paid to Load through ARR Credits
- Excess auction revenue (after fully funding ARRs) is used to improve FTR funding
- Close to 90 percent of annual auction revenue currently flows to ARR holders
- Total ARR revenue has steadily declined in recent years – while congestion expectations are always a driver of FTR valuation, increased FTR underfunding would be expected to result in lower FTR auction revenues and consequently lower ARR payments to load

	ARR Credits ($ millions)	Auction Surplus ($ millions)	
2009/10	$ 1,273	$ 92	7%
2010/11	$ 1,029	$ 67	6%
2011/12	$ 947	$ 109	10%
2012/13	$ 565	$ 67	11%
2013/14	$ 502	$ 76	13%

1. PJM Presentation on FTR/ARR Funding, PJM FTRSTF, Aug 4, 2014
http://www.pjm.com/~/media/committees-groups/task-forces/ftrstf/20140804/20140804-updated-education-presentation.ashx

A Different Example

- An LSE wants to construct a remote generator and fund a merchant transmission line to enable energy delivery to its load
- While the LSE has locked in a long-term supply arrangement to meet its load by building a generator, it has also taken on a congestion or basis risk based on the CLMP difference between its new supply source and its load
- The LSE is awarded long-term FTRs to hedge this congestion/basis risk
- LSE expects to schedule load and generation in the Day-Ahead market and would be exposed to congestion charges based on the difference between DA CLMPs at generation and load locations
- If the LSE’s FTRs are settled using DA CLMPs, they will adequately hedge the LSE’s congestion exposure
- If the LSE’s FTRs are settled based on an allocation of “total congestion” that includes balancing congestion, they will no longer hedge the LSE’s actual congestion exposure

Evolution of FTR/ARR Discussion in SOM Reports

2004 SOM

- Effective June 1, 2003, PJM replaced the allocation of FTRs with an allocation of Auction Revenue Rights (ARRs) and an associated Annual FTR Auction. The process for allocating ARRs is identical to the previous process for allocating FTRs, but the revenues received for the allocated ARRs are based on the results of the Annual FTR Auction. Firm transmission customers have the option either to take ARRs or to take the underlying FTRs through a process called self-scheduling.

- ARRs and FTRs are both financial instruments that entitle the holder to receive revenues or to pay charges based on nodal price differences. ARRs provide holders with revenues or charges based on the locational price difference between ARR sources (origins) and sinks (destinations) determined in the Annual FTR Auction. In other words, ARR revenues are a function of FTR auction participants' expectations of locational price differences in the Day-Ahead Energy Market. FTRs provide holders with revenues or charges based on the locational price differences actually experienced in the Day-Ahead Energy Market

- ARR and FTR holders do not need to deliver energy to receive ARR or FTR credits, and neither instrument represents a right to the physical delivery of power. Both can, however, help protect load-serving entities (LSEs) and other market participants from congestion costs in the PJM Day- Ahead Energy Market. Market participants can also hedge against real-time congestion by matching real-time energy schedules with day-ahead energy schedules.

2012 SOM

- 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.

- FTR holders, with the creation of ARRs, do not have the right to financially firm transmission service and FTR holders do not have the right to revenue adequacy. FTR holders appropriately receive revenues based on actual congestion in both day ahead and real time markets. When day ahead congestion differs significantly from real time congestion, as has occurred only recently, this is evidence that there are reporting issues, cross subsidization issues, issues with the level of FTRs sold, and issues with the differences between modeling in the day ahead and real time. Such differences are not an indication that FTR holders are being under allocated total congestion dollars.

2004 State of the Market, March 8, 2005 Market Monitoring Unit, p 39 and 2012 State of the Market – Volume 1, March 15, 2012, p 51
http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2004/pjm-som-2004.pdf
http://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2012/2012-som-pjm-volume1.pdf

2003 FERC Order Approving Creation of ARRs in PJM

"Specifically, under PJM's FTR revisions, **there is no change in the allocation of FTRs to existing entities**. **Those entities entitled to an allocation of FTR's under PJM's existing procedures will be allocated the same rights, in the form of ARRs. These entities can then self-schedule FTRs to hedge against congestion costs.** Thus, the existing congestion rights to which these parties are entitled (and the overall quantity of these rights as they exist system wide) will neither expand nor contract as a consequence of PJM's proposed revisions."

"The only change made in this filing is that PJM has instituted a once-a-year auction procedure by which FTRs can be sold. Such an auction will benefit the market by enabling both potential buyers and sellers of FTRs to obtain better information about the value of FTRs. But, as discussed above, **transmission customers are not required to sell their FTRs in the auction, but can retain them under the right-of-first refusal procedure.** Thus, **the auction will provide these customers with better price information to determine whether they want to sell or retain their FTRs, but does not oblige them to relinquish FTRs, and will have no effect on the existing quantity of these congestion management rights or otherwise alter the methodology currently relied upon by PJM, currently, to allocate these rights."**

Source: FERC Order in ER03-406, March 12, 2003
http://www.pjm.com/~/media/committees-groups/task-forces/ftrstf/20140804/20140804-2003-arr-ferc-filing.ashx

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