

FTRs and Congestion

FTRSTF

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Monitoring Analytics

Congestion Discussion

- **Total congestion is total congestion related charges minus total congestion related credits.**
- **Total Congestion = Total Day Ahead Congestion + Total Balancing Congestion.**
- **FTR designed to allocate total congestion, not day ahead only congestion, not target allocation.**
- **Under and over collection (relative to target allocations) allocated in proportion to FTR holder target allocations relative to total FTR target allocations.**
- **True since the inception of the two settlement system in PJM in 2000.**

DA Ahead Congestion

Bus	DA CLMP	DA MW GEN	DA MW Load	Gen Credit	Load Charges	Total Congestion
A	\$50	100	50	\$5,000	\$2,500	(\$2,500)
D	\$100	50	100	\$5,000	\$10,000	\$5,000
Total		150	150	\$10,000	\$12,500	\$2,500

- **Gen at A (100 MW) and D (50 MW), Load at A (50 MW) and D (100 MW).**
- **50 MW of transfer capability modeled between A and D.**
- **DA CLMP at Bus A is \$50 and DA CLMP at Bus D is \$100.**
- **\$50 x 50 MW of transfer = Over collection= \$2,500**
- **Total Day Ahead Congestion is Total Load Charges – Generation Credits = \$2,500**

DA Ahead Congestion

Bus	DA CLMP	DA MW GEN	DA MW Load	Gen Credit	Load Charges	Total Congestion
A	\$50	90	50	\$4,500	\$2,500	(\$2,000)
D	\$100	60	100	\$6,000	\$10,000	\$4,000
Total		150	150	\$10,500	\$12,500	\$2,000

- **Gen at A (90 MW) and D (60 MW), Load at A (50 MW) and D (100 MW).**
- **40 MW of transfer capability modeled between A and D.**
- **DA CLMP at Bus A is \$50 and DA CLMP at Bus D is \$100.**
- **$\$50 \times 40 \text{ MW} = \text{Overcollection} = \$2,000$**
- **Total Day Ahead Congestion is Total Load Charges – Generation Credits = \$2,000**

Real Time versus Balancing Congestion

- DA has 50 MW transfer, RT 40 MW Transfer, CLMP the same (flat gen offers)

Bus	DA CLMP	DA MW GEN	DA MW Load	Gen Credit	Load Charges	Total Congestion
A	\$50	100	50	\$5,000	\$2,500	(\$2,500)
D	\$100	50	100	\$5,000	\$10,000	\$5,000
Total		150	150	\$10,000	\$12,500	\$2,500
Bus	RT CLMP	RT MW GEN	RT MW Load	Gen Credit	Load Charges	Total Congestion
A	\$50	90	50	\$4,500	\$2,500	(\$2,000)
D	\$100	60	100	\$6,000	\$10,000	\$4,000
Total		150	150	\$10,500	\$12,500	\$2,000
Bus	RT CLMP	Gen DEV	Load Dev	Gen Credit	Load Charges	Bal. Congestion
A	\$50	-10	0	(\$500)	\$0	\$500
D	\$100	10	0	\$1,000	\$0	(\$1,000)
Total Deviation		0	0	\$500	\$0	(\$500)
Total DA + Balancing						\$2,000

Generation Deviations

Less Gen Credit

More Gen Credit

Total generation credits go up by \$500

No change in load charges

Over collection falls by \$500, to \$2000

-\$500 balancing congestion



ARR/FTR Product

- **Allocation of congestion rents collected:**
 - **Provides credit (congestion offset) for transmission access to less expensive generation.**
 - **Evolved from physical rights to transmission.**
 - **Should not provide more revenue than congestion collected.**
 - **Would be over payment to FTR holder**
 - **Target allocation a distribution metric for under and over allocation, not a guarantee of payout.**

Real Time versus Balancing Congestion

- DA has 50 MW transfer, RT 40 MW Transfer, CLMP the same (flat gen offers)

		FTR MW	Flow	CLMP Difference	Target Allocations	Congestion
DA	A to D	50	50	\$50	\$2,500	\$2,500
	Total				\$2,500	\$2,500

		FTR MW	Flow	CLMP Difference	Target Allocations	Congestion
RT	A to D	50	40	\$50	\$2,500	\$2,000
	Total				\$2,500	\$2,000

		FTR MW	Deviation	CLMP Difference	Target Allocations	Balancing Congestion
Balancing	A to D	50	(10)	\$50	\$2,500	(\$500)
	Total				\$2,500	(\$500)

DA + Balancing	A to D					\$2,000
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FTR	Target Allocation	Day Ahead Congestion	Balancing Congestion	Total Congestion	Funding
A to D	\$ 2,500.00	\$ 2,500.00	\$ (500.00)	\$ 2,000.00	\$ (500.00)



50 MW DA



40 MW RT

ARR/FTR Product

- **FTR pay out of \$2,000 offsets congestion completely.**
- **If FTR pay out is \$2,500, but actual congestion is \$2,000, FTR holders would be subsidized.**
- **Depending on allocation of the FTRs and the uplift charges, winners and losers, wealth transfers.**
- **True if single or two settlement.**

ARR/FTR Product

- **If FTR payout to FTR holder is \$2,000 and load charges are \$10,000:**
 - **If load holds the FTR, Load net congestion bill reflects \$10,000. Provided with \$2,000 offset. No subsidies, no overpayment, no double payment.**
 - **If third party holds FTR, load net congestion bill reflects \$10,000. Third party gets \$2,000 offset. No subsidies, no overpayment, no double payment.**
- **If FTR payout to FTR holder is \$2,500 and load charges are \$10,000:**
 - **If load holds the FTR, Load net congestion bill reflects \$10,000. Provided with \$2,500 “offset.” Load provided with \$500 more than congestion incurred. FTR is subsidized. Where there are multiples FTRs and FTR holders, will result in cross subsidies.**
 - **If load pays the \$500, load breaks even, but FTR overpaid.**
 - **If third party pay the \$500 difference, FTR is still overpaid (subsidized) by virtual players, wealth transfer to FTR holder (load).**
 - **If third party load holds the FTR, load net congestion bill reflects \$10,000. No offset to load. Third party paid \$2,500 “offset.” Third party provided with \$500 more than congestion incurred.**
 - **If load pays the \$500 difference, FTR is overpaid (subsidized) by load. Load pays more in congestion than actually realized. Double payment for congestion incurred.**
 - **If the third party pays the \$500 difference, third party breaks even relative to congestion incurred, but FTR is overpaid.**

Real Time versus Balancing Congestion

- DA has 50 MW transfer, RT 50 MW Transfer, CLMP the same (flat gen offers), FTR 100 MW.

		FTR MW	Flow	CLMP Difference	Target Allocations	Congestion
DA	A to D	100	50	\$50	\$5,000	\$2,500
	Total				\$5,000	\$2,500

		FTR MW	Flow	CLMP Difference	Target Allocations	Congestion
RT	A to D	100	50	\$50	\$5,000	\$2,500
	Total				\$5,000	\$2,500

		FTR MW	Deviation	CLMP Difference	Target Allocations	Balancing Congestion
Balancing	A to D	100	-	\$50	\$5,000	\$0
	Total				\$5,000	\$0

DA + Balancing	A to D					\$2,500
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	Target Allocation	Day Ahead Congestion	Balancing Congestion	Total Congestion	Funding
\$	5,000.00	\$ 2,500.00	\$ -	\$ 2,500.00	\$ (2,500.00)



50 MW DA



50 MW RT

ARR/FTR Product

- **FTR pay out of \$2,500 offsets congestion completely.**
- **If FTR pay out is \$5,000, but actual congestion is \$2,500, FTR holders would be subsidized.**
- **Depending on allocation of the FTRs and the uplift charges, winners and losers, wealth transfers.**
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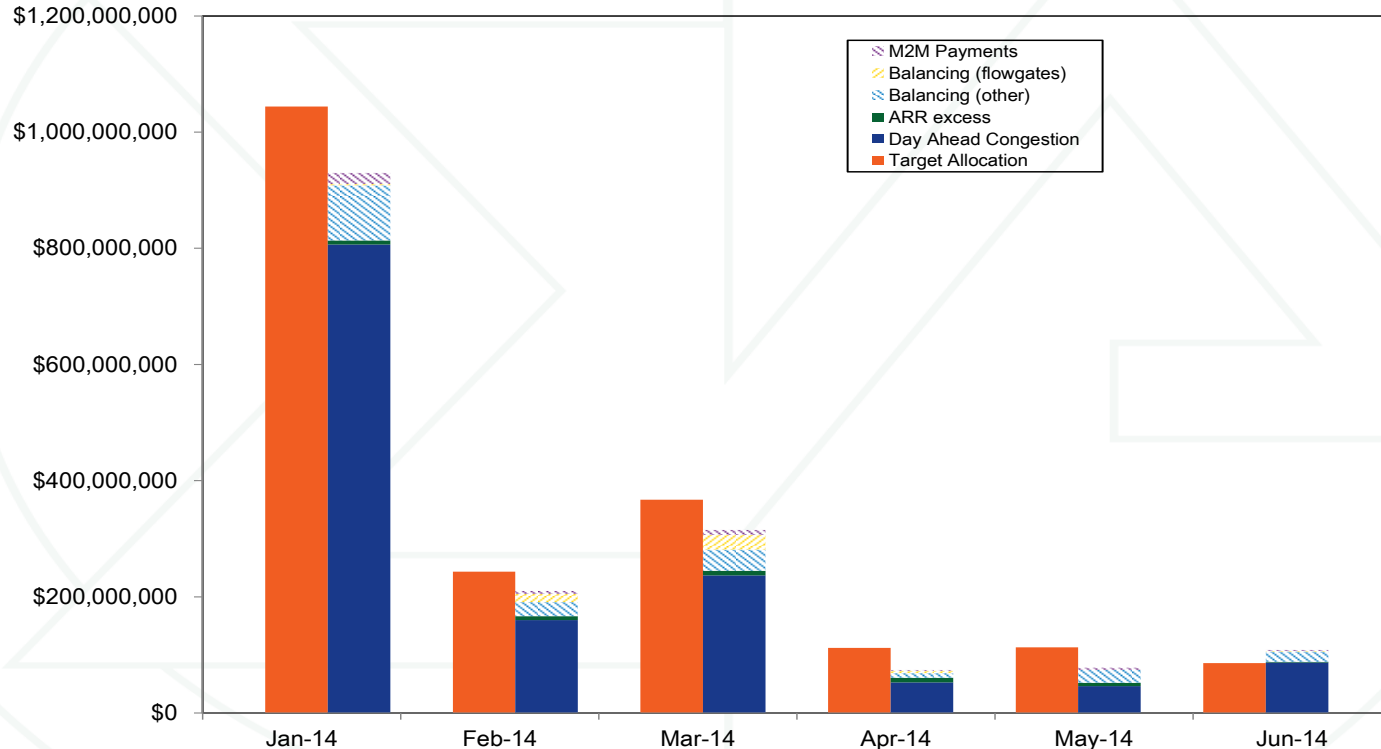
ARR/FTR Product

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 - **If load pays the \$2,500 difference, FTR is overpaid (subsidized) \$2,500 by load. Load pays more in congestion than actually realized. Double payment for congestion incurred.**
 - **If the third party pays the \$2,500 difference, third party breaks even relative to congestion incurred, but FTR is overpaid.**

Congestion/ARR/FTR Product

- **No position in PJM day ahead market is held harmless to interactions between the day ahead and real time markets (balancing, uplift)**
- **All positions are financial day ahead and trued up via (balancing) adjustments, based on actual system conditions.**
- **Total congestion = DA + Balancing**
- **Target allocation not a guarantee of FTR payouts**
- **Total FTR payouts do not exceed total congestion collected.**
- **True since the inception of the two settlement system in PJM in 2000.**

Figure 13-16 FTR target allocation compared to sources of positive and negative congestion revenue



MMU Proposed Options

- 1. Report correct monthly payout ratios**
- 2. Eliminate portfolio netting subsidizations**
- 3. Eliminate counter flow FTR subsidizations**
- 4. Eliminate cross geographic subsidies**
- 5. Improve outage modeling in FTR auctions**
- 6. Reduce FTR availability on persistently underfunded paths/facilities**
- 7. Implement seasonal ARR and FTR allocation methods**
- 8. Eliminate over allocation of Stage 1A ARRs**



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