

# UTC Review and Recommendations

MIC meeting on  
UTCs  
April 10, 2014

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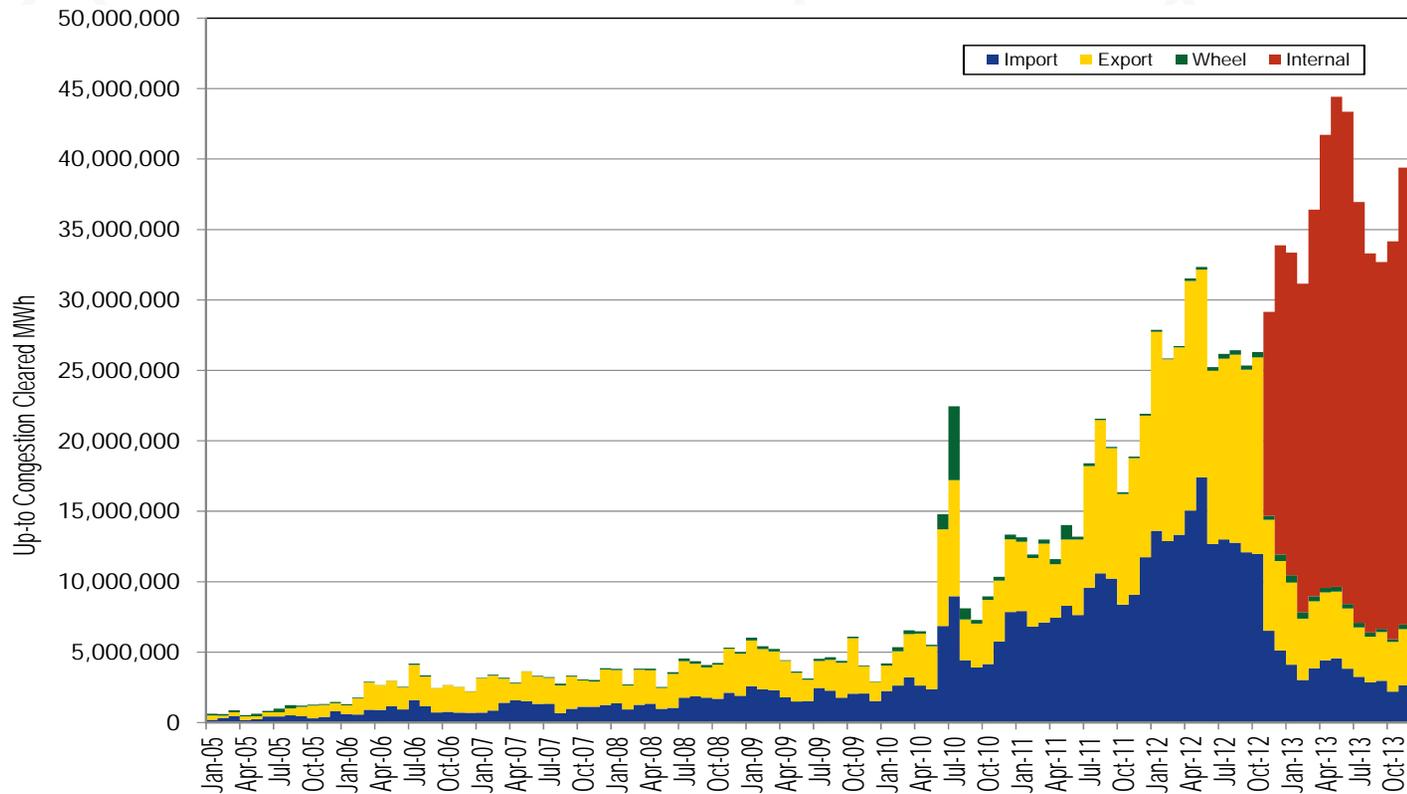
Monitoring Analytics

## **UTC: Premature to expand the product**

- **No evidence that the current rules regarding allowed node set and price spread are preventing effective use of the product**
- **Evidence that product is having an effect on the system**
  - **Unit Commitment and dispatch**
  - **Congestion**
  - **FTR revenues**
  - **Day ahead market solution issues**



# PJM cleared up-to congestion transactions by type (MW): 2005 through 2013

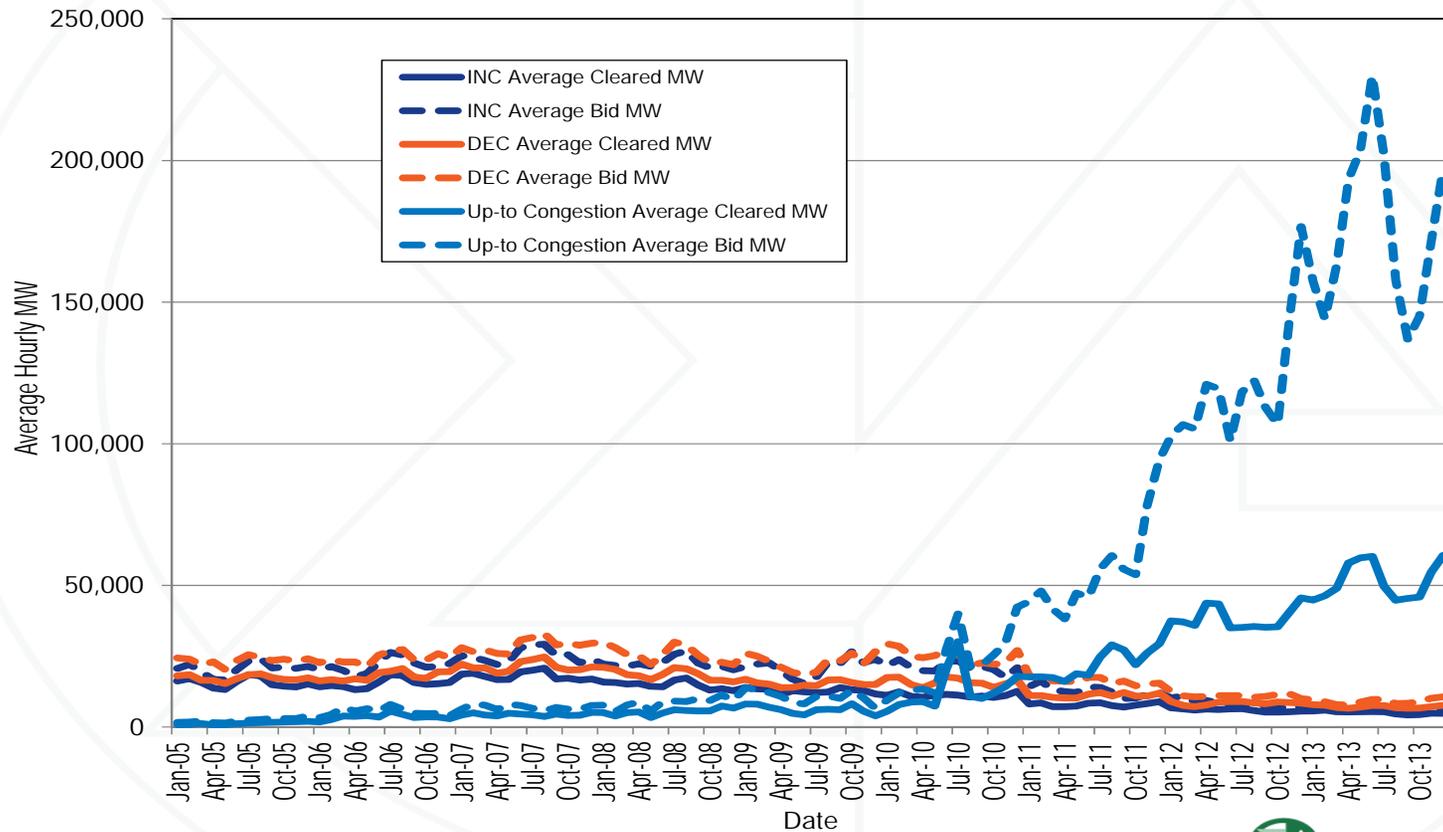


## **UTC: Premature to expand the product**

- **Evidence that UTC are displacing the use of other products due to preferential treatment**



## Hourly volume of bid and cleared INC, DEC and Up-to Congestion bids (MW) by month: 2005 through 2013



## **UTC: Premature to expand the product**

- **Product definition needs to include an allocation of uplift charges consistent with treatment of INCs and DEC**
- **FTR forfeiture rule needs inform application to all virtual bids and offers**



## UTC Analysis: May Study

- **PJM performed a study of market results with and without UTC bids using PJM's Day Ahead ALSTOM SPD program and its day ahead commitment practices, for five days in May (May 2, 4, 22, 23 and 27).**
- **The IMM used the data from PJM's May Study to examine the impact of UTCs on PJM markets.**
- **The IMM examined the impacts of UTCs on unit dispatch, unit commitment, day ahead and real time LMP convergence, day ahead congestion, balancing congestion and FTR funding.**



## UTC Analysis: December Study

- **PJM performed a study of market results with and without UTC bids and with and without INCs and DECs using PJM's Day Ahead RSC and PROBE program for four days (December 10, 14, 18 and 23).**
- **Both PJM and the IMM used the data from PJM's December Study to examine the impact of UTCs and INCs and DECs on unit dispatch and unit commitment.**

# UTC Analysis: Impact on unit commitment

- **PJM and the IMM agree that the data from the May and December studies indicated that UTCs affect unit commitment and dispatch in the day ahead market.**
- **PJM and the IMM agree that the data from the December study indicated that INCs and DECAs affect unit commitment and dispatch in the day ahead market.**
- **PJM and the IMM agree that the magnitude of the impact on unit commitment status and unit output varies by day.**



## UTC Analysis: Uplift Charges

- **PJM and the IMM agree that due to their effect on unit commitment and dispatch, UTCs should pay operating reserve charges**
- **The IMM position is that UTCs should pay operating reserve charges consistent with charges paid by INCs and DEC.**
- **PJM and the IMM recommend that the EMU process continue to review the appropriate level and allocation of operating reserve charges.**

## UTC Analysis: Uplift Charges

- **The IMM recommends that UTCs be allocated uplift charges immediately, consistent with the treatment of INCs and DECAs, pending further changes approved in the stakeholder process.**
  - **UTCs, like INCs and DECAs, affect unit commitment, unit dispatch, uplift charges, LMP, congestion and FTR revenue adequacy.**
  - **UTC are currently provided preferential treatment relative to INCs and DECAs.**

## UTC Analysis: Uplift Charges

- **IMM calculated the impact of allocating uplift to UTCs (using same rules as for INCs and DEC)s accounting for the impact of such payments on the profitability of the transactions**
  - **In 2013, 55.4 percent of all up-to congestion transactions were profitable.**
  - **Assumed that up-to congestion transactions would have maintained the same shares of profitable and unprofitable transactions with charges applied**
  - **46.7 percent of all up-to congestion transactions would have been made**



## UTC Analysis: Uplift Charges

- **Up-to congestion transactions would have paid an average rate between \$1.013 and \$2.680 per MWh in 2013 if charged in a manner consistent with INCs and DEC allocations.**
- **Rates would go down for all other transaction types**



# UTC Analysis: Uplift Charges 2013

Transaction		Current Rates (\$/MWh)	Proposed Rates (\$/MWh)	Change (\$/MWh)	Change (%)
East	INC	3.198	1.308	(1.890)	(59.1%)
	DEC	3.301	1.372	(1.929)	(58.4%)
	DA Load	0.103	0.064	(0.039)	(38.3%)
	RT Load	0.073	0.073	(0.000)	(0.0%)
	Deviation	3.198	1.308	(1.890)	(59.1%)
West	INC	1.561	0.475	(1.086)	(69.6%)
	DEC	1.664	0.538	(1.126)	(67.7%)
	DA Load	0.103	0.064	(0.039)	(38.3%)
	RT Load	0.053	0.053	(0.000)	(0.0%)
	Deviation	1.561	0.475	(1.086)	(69.6%)
UTC	East to East	NA	2.680		
	West to West	NA	1.013		
	East to/from West	NA	1.846		

# UTC Analysis: Uplift charges after applying uplift related recommendations in 2014 SOM

- **IMM calculated the impact of allocating uplift to UTCs accounting for the impact of such payments on the profitability of the transactions, using all of the 2014 SOM uplift related recommendations**
  - **Assumed that up-to congestion transactions would have maintained the same shares of profitable and unprofitable transactions with charges applied**
  - **With identified uplift determination and allocation reforms, 66.7 percent of all up-to congestion transactions would have been made**

# Uplift Charges after Proposed Reforms: 2013

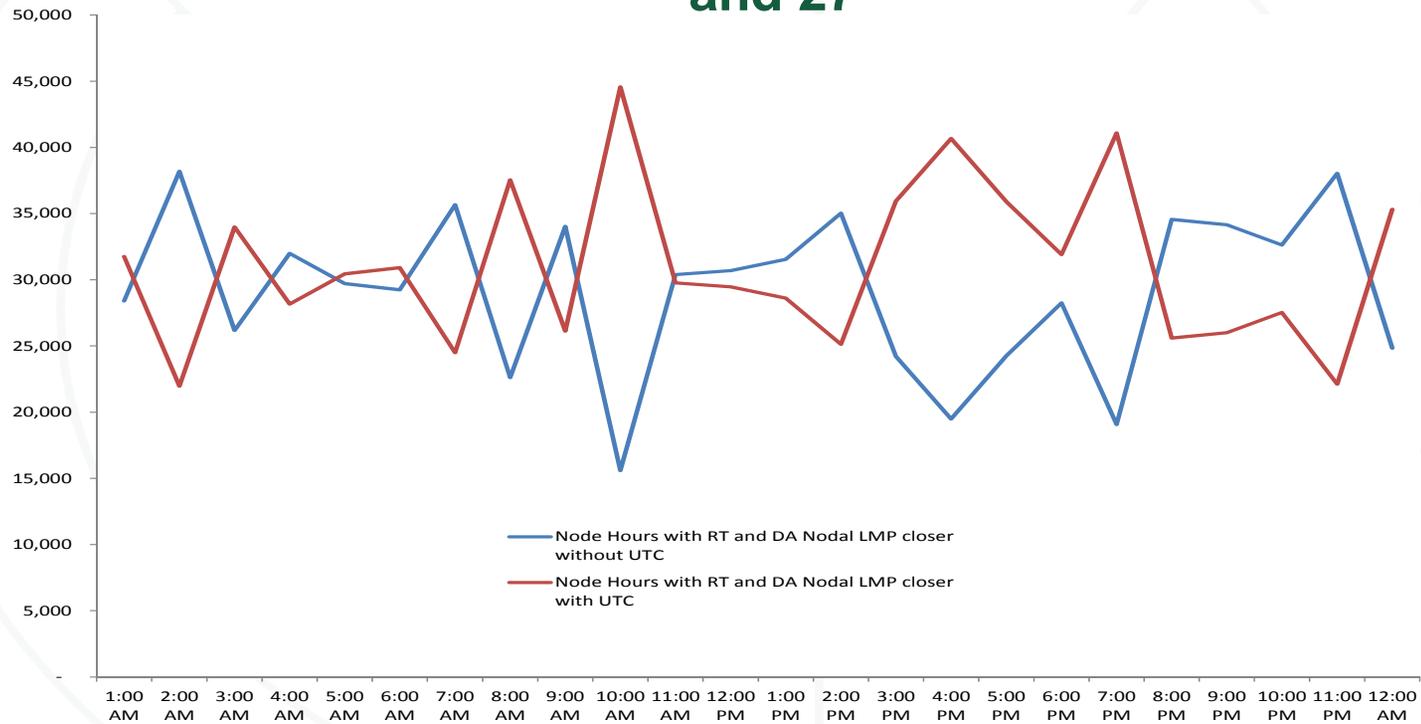
	Transaction	Current Rates (\$/MWh)	Proposed Rates (\$/MWh)	Change (\$/MWh)	Change (%)
East	INC	3.198	0.176	(3.022)	(94.5%)
	DEC	3.301	0.202	(3.099)	(93.9%)
	DA Load	0.103	0.026	(0.077)	(74.6%)
	RT Load	0.073	0.057	(0.016)	(22.5%)
	Deviation	3.198	0.176	(3.022)	(94.5%)
West	INC	1.561	0.125	(1.436)	(92.0%)
	DEC	1.664	0.151	(1.513)	(90.9%)
	DA Load	0.103	0.026	(0.077)	(74.6%)
	RT Load	0.053	0.036	(0.016)	(31.4%)
	Deviation	1.561	0.125	(1.436)	(92.0%)
UTC	East to East	NA	0.377		
	West to West	NA	0.276		
	East to/from West	NA	0.327		

## May UTC Analysis: Impact on price convergence

- **Study results show that UTCs affected LMP through impacts on dispatch and unit commitment.**
- **Study results show no evidence to support the claim that UTCs contributed to overall day ahead and real time price convergence.**
- **Study results show that the impact of UTCs on day ahead and real time LMP differences varied by pricing node, by hour and by day, in both magnitude and direction.**



## Node hours that day ahead and real time LMP was closer with or without UTC in PJM's Alstom Simulation: May 2, 4, 22, 23 and 27



## UTC Arbitrage versus Point Specific Arbitrage

	Bus A LMP	Bus B LMP	LMP Difference (A-B)	LMP Difference (B-A)
DA Market	\$ 100.00	\$ 90.00	\$ 10.00	\$ (10.00)
RT Market	\$ 110.00	\$ 95.00	\$ 15.00	\$ (15.00)
MW	DEC = - -1	INC = + 1		
Day Ahead Revenues	\$ (100.00)	\$ 90.00		
Real Time Revenues	\$ 110.00	\$ (95.00)	Total	
Net revenues	\$ 10.00	\$ (5.00)	\$ 5.00	

## UTC Profitability by source and sink bus: 2012 and 2013

Year	Cleared UTC Bids	Profitable UTC Bid	UTC Profitable at Source Bus	UTC Profitable at Sink Bus	Profitable UTC	Profitable Source	Profitable Sink
2012	9,053,260	4,908,131	5,627,266	3,567,325	54.2%	62.2%	39.4%
2013	14,736,798	8,162,744	9,883,565	4,994,347	55.4%	67.1%	33.9%

## UTC Profitability and Modeled Divergence by Source and Sink Point by Hour: PJM results May 2, 22, 23 and 27

Cleared UTC Bids	Profitable UTC Bids	UTC Profitable at Source Bus	UTC Profitable at Sink Bus	Source LMP Diverge with UTC Bid	Sink LMP Diverge with UTC Bid	Profitable UTC	Profitable Source	Profitable Sink	Source LMP Diverge with UTC Bid	Sink LMP Diverge with UTC Bid
201,867	118,339	151,596	55,533	87,333	91,890	58.6%	75.1%	27.5%	43.5%	45.5%

# May UTC Analysis: Impact on congestion

- **Study results show that UTCs significantly increased day ahead congestion.**
  - **UTCs increased the number of constraints that bind in the day ahead market.**
  - **UTCs affected the hours that the constraints bind.**
  - **UTCs affected the shadow prices of the constraints in the day ahead market.**



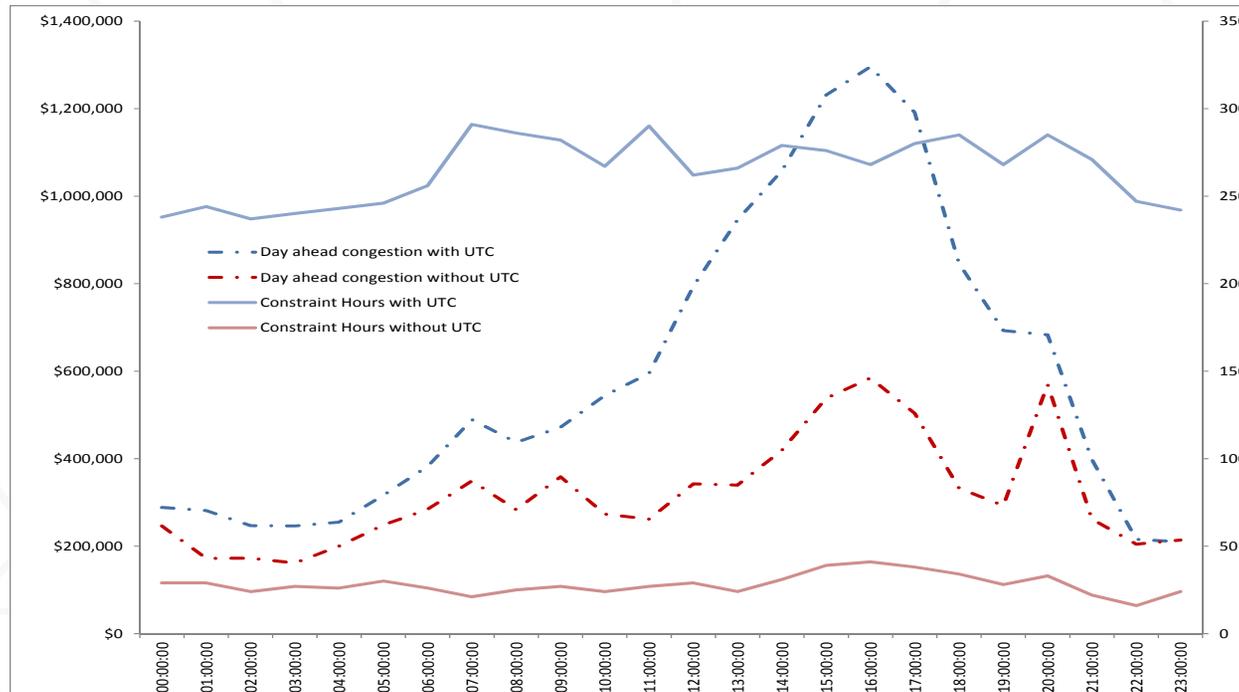
# May UTC Analysis: Impact on congestion

- **Study results show that UTCs increase negative balancing congestion.**
  - **Removing UTCs reduced the number of day ahead constraints and day ahead congestion.**
  - **Removing UTCs made day ahead results more consistent with real time constraints and real time congestion.**
  - **Removing UTCs reduced negative balancing congestion.**



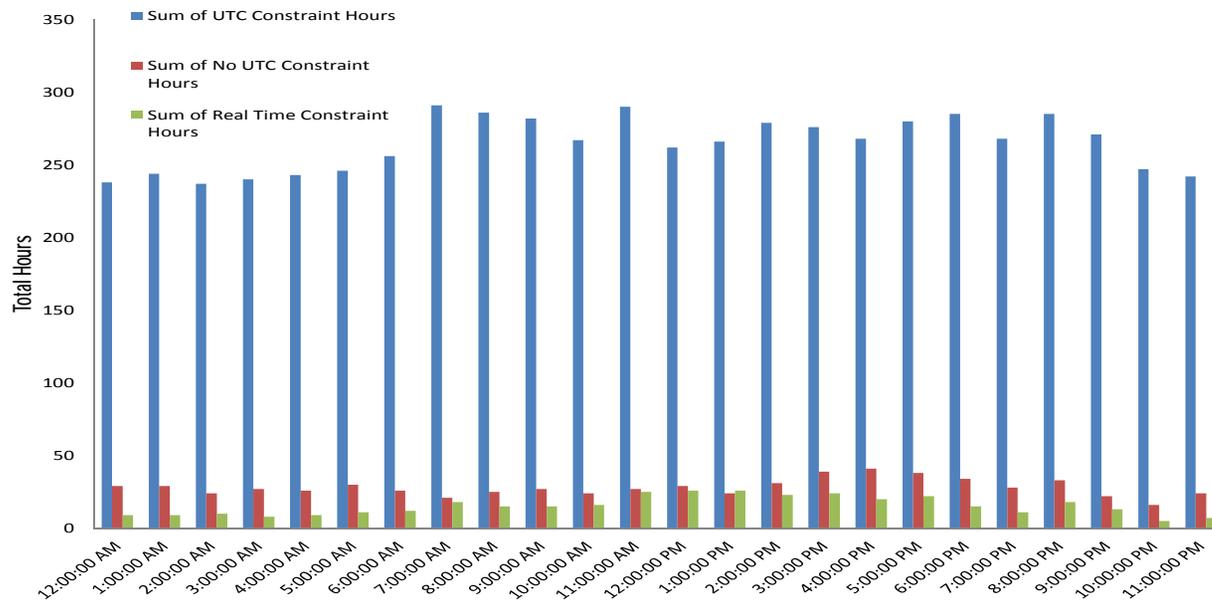
# UTC Analysis: Impact on congestion

- Total day ahead congestion and number of day ahead binding constraints by hour, with and without UTC: May 2, 4, 22, 23 and 27



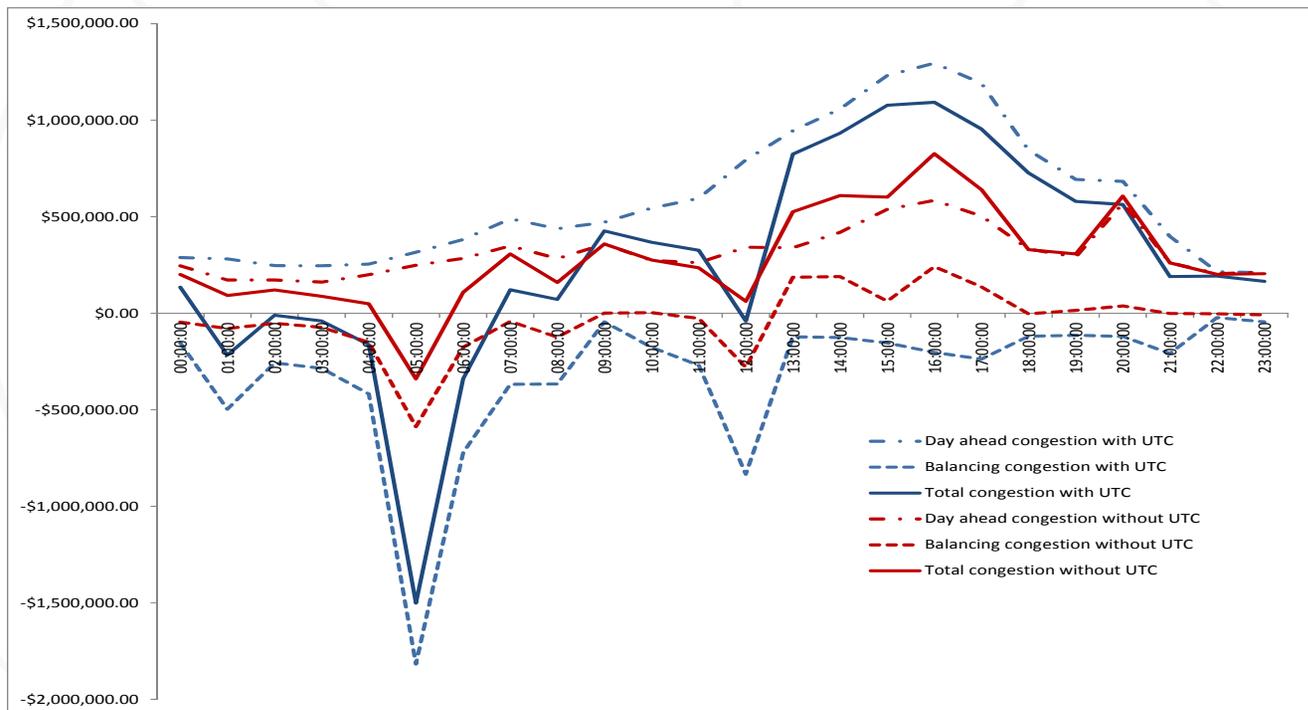
# UTC Analysis: Impact on congestion

- Comparison of total constraint hours by hour day ahead with and without UTC and real time: May 2, 4, 23, 24, 27



# UTC Analysis: Impact on congestion

- Total day ahead congestion and total balancing congestion by hour, with and without UTC: May 2, 4, 22, 23 and 27



## UTC Analysis: FTR Funding

- **Study results show that UTCs contributed significantly to FTR underfunding relative to target allocations.**
- **For the five days studied, the removal of UTCs changed FTR funding relative to target allocations from a deficit of -\$4.1 million to a net surplus of \$537 thousand, a gain in funding relative to target allocations of \$4.7 million.**
- **For the five days studied, removing UTCs reduced target allocations from \$16,241,505 to \$7,780,223. The reduction was \$8,461,282, or 52 percent.**



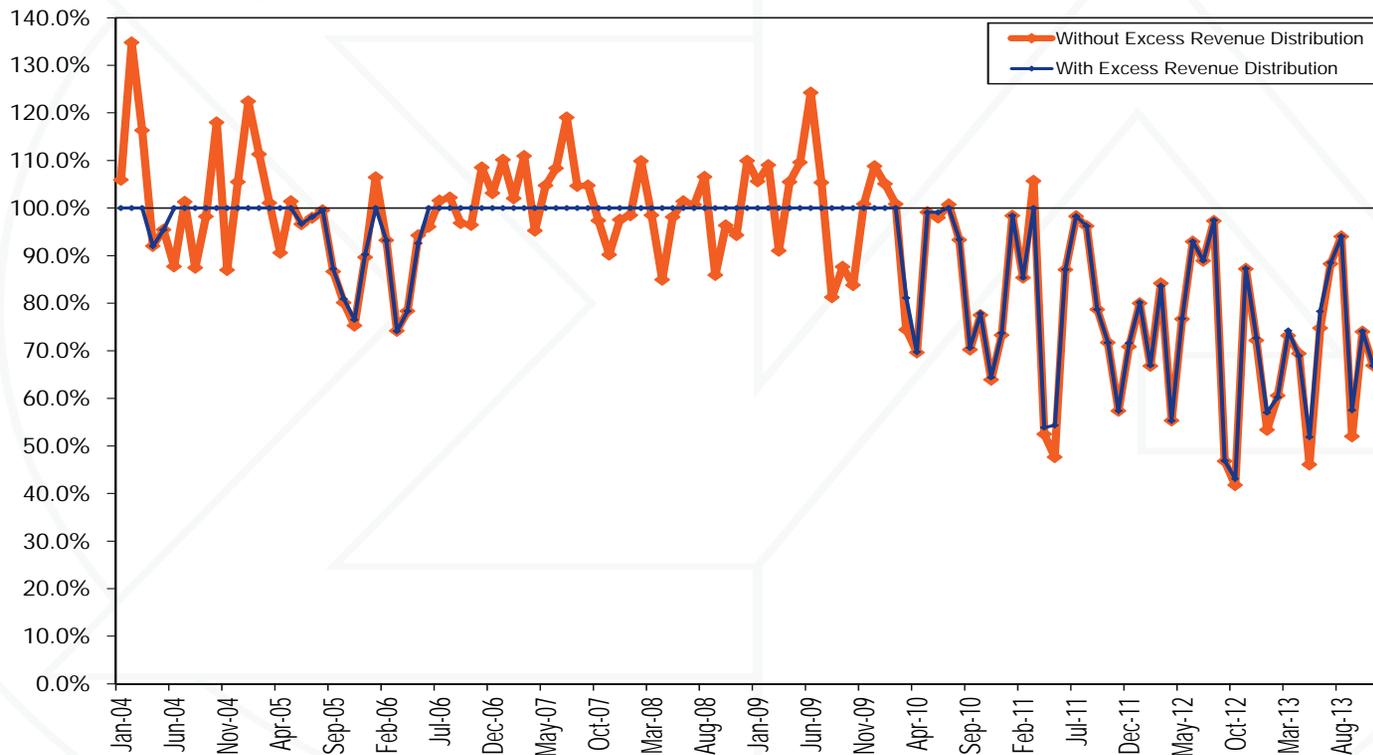
# UTC Analysis: Target Allocations

Date	Actual Target Allocations	No UTC Target Allocations	Difference in Target Allocations	Change in Target Allocations
2-May-13	\$ 1,361,463.96	\$ 1,060,874.04	\$ (300,589.92)	-22%
4-May-13	\$ 934,839.91	\$ 137,589.44	\$ (797,250.47)	-85%
22-May-13	\$ 7,002,555.06	\$ 2,605,640.16	\$ (4,396,914.90)	-63%
23-May-13	\$ 6,125,558.76	\$ 3,779,988.07	\$ (2,345,570.69)	-38%
27-May-13	\$ 817,087.72	\$ 196,131.77	\$ (620,955.95)	-76%
Total	\$ 16,241,505.41	\$ 7,780,223.48	\$ (8,461,281.93)	-52%

# UTC Analysis: FTR Underfunding

Date	Actual Underfunding	No UTC Underfunding	Difference in Underfunding	Change in Underfunding
2-May-13	\$ (440,207.00)	\$ (399,119.97)	\$ 41,087.03	-9%
4-May-13	\$ (290,472.92)	\$ 153,428.99	\$ 443,901.91	-153%
22-May-13	\$ (1,643,019.83)	\$ 1,375,704.81	\$ 3,018,724.64	-184%
23-May-13	\$ (1,746,891.15)	\$ (628,183.15)	\$ 1,118,708.00	-64%
27-May-13	\$ (26,063.59)	\$ 35,212.85	\$ 61,276.44	-235%
Total	\$ (4,146,654.49)	\$ 537,043.53	\$ 4,683,698.02	-113%

# Figure 13-19 FTR payout ratio by month, excluding and including excess revenue distribution: January 2004 through December 2013



# UTC Summary of Recommendations

- **The IMM recommends that UTCs be allocated uplift charges immediately, consistent with the treatment of INCs and DECAs, pending further changes approved in the stakeholder process.**
- **FTR forfeiture rule should be applied uniformly to all virtual bids and offers**



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